The Royal Australian Air Force has prepared this *Air Force Capability Guidebook* to inform interested parties about the strategic utility of Australia’s air power and to describe Air Force capabilities and organisational structure. This book aims to promote a broad understanding of how Air Force employs air power to contribute to Australia’s security needs which may in turn be useful in supporting broader strategic planning. This may include activities such as force structure reviews, integrated investment planning and ongoing implementation of Plan *Jericho*.

The information contained within this publication should also assist interactions between Defence and other government departments. Importantly, this publication is intended to inform members of Government, other government departments, industry, academia, non-government organisations and visiting officials of the nature and complexity of our Air Force and the vital role it plays in Australia’s security.

Air Force has an enduring responsibility to the Australian Government to generate effective and potent air power options that contribute to operations that defend the nation and its strategic interests. These operations will often be conducted jointly and with other government agencies, allies, and coalition partners.

At the turn of the decade, every RAAF aircraft will have fifth-generation characteristics that introduces quantum advances in technical complexity and operational effects. Building the Air Force of the future around these capabilities will demand enhancements in professional competencies and a transformation in the ways we operate as a fifth-generation force. While integrating these new systems into the ADF joint force design, we will continue to test and evaluate emerging technologies and continue to provide responsive and competent military air power options.
These changes can only be achieved in partnership with decision-makers across Government, Defence, industry, academia and our Allied partners who are informed with respect to Air Force capabilities. I have therefore directed the preparation of Air Force Capability Guidebook to assist in creating and strengthening these partnerships.

Leo Davies, AO, CSC
Air Marshal
Chief of Air Force
# CONTENTS

## PART 1 - AUSTRALIAN AIR POWER ............................................................... 7

- **INTRODUCTION** .................................................................................. 8
- **AIR FORCE VALUES AND IDENTITY** .............................................. 8
- **AIR FORCE OPERATIONS – PAST AND PRESENT** ......................... 11
  - Early History
    - and World War I ................................................................. 11
    - World War II ........................................................................... 11
    - Recent Conflicts and Peacekeeping ........................................... 12
    - Today’s Air Force ................................................................. 12
  - FROM STRATEGIC TASKS TO FORCE DETERMINANTS ............... 16
    - Strategic Utility of Air Power .................................................. 16
    - Air Force Strategic Tasks ....................................................... 18
    - Shaping Australia’s Security Environment ................................ 18
    - Deter Threats to National Interests ......................................... 18
    - Respond to Attacks or Threats to Australian Interests ............. 18
  - AIR FORCE – LEADING THE DELIVERY OF AIR POWER .......... 20
    - Air Force Mission .................................................................... 20
    - Air Power .................................................................................. 22
    - Air Power Roles ....................................................................... 22
    - Core Air Power Roles ............................................................. 23
    - Enabling Air Power Roles ....................................................... 24
    - Transforming the Air Force ..................................................... 25
    - The Networked Fifth-Generation Air Force ............................. 27
    - Generations of Fighter Aircraft ................................................. 28
  - AIR FORCE: TODAY’S AIR POWER .................................................. 29
    - Organisation ............................................................................. 29
    - Air Force Headquarters .......................................................... 33
    - Air Command .......................................................................... 36
    - Force Element Groups ............................................................ 37
    - Air Combat Group .................................................................... 40
    - Air Mobility Group .................................................................. 42
    - Surveillance and Response Group ............................................ 44
    - Air Force Training Group ......................................................... 47
    - Combat Support Group ........................................................... 51
    - Air Warfare Centre ................................................................. 54
  - AIR FORCE PEOPLE ................................................................... 57
    - Air Force Professional Mastery ................................................ 57
    - Air Force People ...................................................................... 57
    - Air Force Job Families ............................................................ 58
    - Air Force Reserves .................................................................. 60
    - Australian Air Force Cadets ..................................................... 61
    - Australian Defence Force Ranks and Insignia ......................... 61
PART 2 - AIR FORCE CAPABILITIES ................................................................. 63

Introduction .................................................................................................................. 64

SUMMARY OF AIR FORCE CAPABILITIES ........................................................... 65

AIR COMBAT GROUP ............................................................................................ 66

STH-18G Growler .......................................................................................................... 66
F-35A Lightning II .......................................................................................................... 67
F/A-18A/B ‘Classic’ Hornet ............................................................................................ 68
F/A-18F ‘Rhino’ Super Hornet ...................................................................................... 69
Hawk 127 Lead-In Fighter ............................................................................................ 70
Pilatus PC-9/A Forward Air Control ............................................................................ 71
Combat Control Team ................................................................................................... 71

SURVEILLANCE AND RESPONSE GROUP ................................................................ 73

AP-3C Orion .................................................................................................................... 73
E-7A Wedgetail .............................................................................................................. 74
MC-55A Gulfstream ....................................................................................................... 75
MQ-4C Triton Unmanned Aircraft System ................................................................... 76
P-8A Poseidon ............................................................................................................... 77
Defence Air Traffic Control .......................................................................................... 78
Jindalee Operational Radar Network ......................................................................... 79
Mobile Control and Reporting Centre ......................................................................... 80
Vigilare .......................................................................................................................... 81
Space Surveillance Radar ............................................................................................ 82
Space Surveillance Telescope ....................................................................................... 82

AIR MOBILITY GROUP ........................................................................................... 84

737 Boeing Business Jet .............................................................................................. 84
C-17A Globemaster III ................................................................................................... 85
C-27J Spartan Battlefield Airlifter ................................................................................. 86
C-130J Hercules ........................................................................................................... 87
KC-30A Multi-Role Tanker Transport ......................................................................... 88
CL-604 Challenger ........................................................................................................ 89

AIR FORCE TRAINING GROUP .............................................................................. 90

Pilatus PC-9/A Pilot Trainer ......................................................................................... 90
Pilatus PC-21 Pilot Trainer .......................................................................................... 91
KA350 King Air ............................................................................................................ 92

COMBAT SUPPORT GROUP .................................................................................... 93

Bushmaster Protected Mobility Vehicles ..................................................................... 93
Light Weight G-Wagon ................................................................................................ 94
Military Working Dogs ............................................................................................... 95
Panther Airfield Fire Truck .......................................................................................... 96
Titan Firefighting Field Truck ...................................................................................... 97
Woomera Range Complex .......................................................................................... 98

AIR WARFARE CENTRE ......................................................................................... 99

History ......................................................................................................................... 99
Purpose ......................................................................................................................... 99
Organisation .................................................................................................................. 99

PART 3 - Glossary ....................................................................................................... 101

TERMINOLOGY ........................................................................................................ 102
ABBREVIATIONS ........................................................................................................ 107
INTRODUCTION

Established in 1921, the Royal Australian Air Force (RAAF), or Air Force, is the second-oldest air force in the world. We have a proud tradition of service, with a history of contributions across the full spectrum of conflict. This has—and continues to include—joint and coalition operations, peacekeeping, humanitarian assistance and disaster relief, and international military relationships management.

This section briefly describes the values, beliefs and culture that define Air Force; the higher strategic determinants that steer Air Force employment of Air Power; and the roles for the effective delivery of Australian air power that have been derived from nearly 100 years of operations.

AIR FORCE VALUES AND IDENTITY

Air Force has a shared set of values for all its members. These establish a basis for personal behaviour and reflect the standards we expect of ourselves and our colleagues. Rather than an end point for cultural change, their intent is to transform daily behaviours of all Air Force personnel: to promote a culture of high esteem and trust, to serve with pride, and to protect, support and serve the people of Australia and our national interests.

Respect
Air Force people always respect the rights of others. Our people are just and inclusive. We recognise diversity is essential to improve our capability.

Excellence
Air Force people demonstrate professionalism, mastery and continuous improvement in everything we do. Our people are motivated and encouraged to innovate. We are capability focused, operationally ready and are driven to successfully complete the missions required of us.

Agility
Air Force people respond swiftly to challenges. Our people are resilient and quickly adapt to changes in our environment. We are flexible in how we think and act and we use resources wisely.

Dedication
Air Force people are trusted to defend our country. Our people are courageous and serve with pride and commitment. We cherish our heritage, honour the achievements and sacrifices of those who have gone before us and will create the legacy for the future.

Integrity
Air Force people have the courage to do what is right. Our people are honest, ethical and demonstrate sound judgement. We hold ourselves and others to account.

Teamwork
Air Force people work together to deliver precision air and space power. Our people collaborate with the Defence Team and our partners. We share the responsibility to ensure a safe environment, everywhere and always.
The RAAF Badge
In 1937 the newly appointed Chester Herald, John Heaton-Armstrong, was commissioned to prepare a design for a RAAF badge, which was finally accepted in 1939. The Air Force Badge features a circle inscribed with the words ‘Royal Australian Air Force’, and ensignied with the Imperial Crown, in front is a wedge-tailed eagle in flight. Beneath the circle is a separate scroll with the Latin motto: ‘Per Ardua Ad Astra’. Although no specific record of the translation exists, it is widely believed to mean: ‘Through Struggle to the Stars’. The motto was derived from Sir Henry Rider Haggard’s famous novel *The People of the Mist* and was selected and approved as the motto for the Royal Flying Corps on 15 March 1913 and remains with the Royal Air Force today. In 1929 the Royal Australian Air Force decided to adopt it too.

Air Force Roundel
When the Royal Australian Air Force was formed on 31 March 1921, it adopted the existing red, white and blue roundel of the Royal Air Force to identify the aircraft. However the red inner circle was removed during World War II when a No 11 Squadron Catalina was mistaken for a Japanese aircraft by a United States Navy Wildcat. After the war the red was re-introduced, but on 2 July 1956 the red kangaroo ‘in motion’ was chosen as the most popular centre piece from a range of other options including the Southern Cross, a boomerang and a sprig of wattle. It has been displayed with pride, not only on aircraft, but on various promotional material ever since. The kangaroo within the Air Force roundel always faces the left except when used on aircraft or vehicles, when the kangaroo should always face the front.
Air Force Logo
On 20 December 2001, the Chief of Air Force formally standardised the Royal Australian Air Force’s public ‘signature’ logo format—a combination of the RAAF Roundel as the ‘0’ within the customised logo and the text of Air Force in the Air Force blue colour. The RAAF roundel is recognised worldwide as Australian, and within the wording ‘Air Force’, it is readily recognisable on a variety of general promotional material, publications and displays.

RAAF Ensign
The design of the Royal Australian Air Force ensign was approved by King George VI in 1948 and formally adopted in Australia in 1949. Previously, the ensign of the RAF had been used. The Australian ensign differed from the British ensign by the addition of the Southern Cross and Commonwealth Star. A red kangaroo ‘in motion’ had replaced the red inner circle of the RAF roundel in 1956, to create a distinctive national emblem for identifying RAAF aircraft, and this roundel was also adopted on the Australian ensign in 1982. This effectively makes the ensign the battle ensign of the RAAF. Accordingly, the ensign is always to be treated with the dignity and respect befitting the proud history of the RAAF. It is flown at all Air Force establishments and paraded at ceremonies, and signifies the bond of service.
AIR FORCE OPERATIONS – PAST AND PRESENT

Early History and World War I

Military aviation came of age during World War I when airships and early aircraft were principally used for reconnaissance. Australia’s four Australian Flying Corps (AFC) squadrons were part of the Australian Imperial Force (AIF) and attached to larger British Royal Flying Corps/Royal Air Force formations.

During World War I, 800 officers and 2840 airmen served in the AFC. Of these, 175 made the ultimate sacrifice in giving their life for their country. Many AFC veterans helped to lay the foundations for the Royal Australian Air Force, whilst others would enter industry and make significant contributions to civil aviation. In 1920, the AFC aircraft and personnel were formed into the Australian Air Corps. The Australian Air Force was established as an independent Service on 31 March 1921, with the ‘Royal’ prefix added on 31 August 1921.

World War II

In World War II, Australian airmen fought in air campaigns conducted over Europe, North Africa, the Middle East, North Atlantic, Indian and Pacific Oceans, the Mediterranean and Asia. They also fought over Australia, its territories and approaches. In late 1944, the strength of the RAAF peaked at over 182,000 personnel and 6200 aircraft, organised into 61
squadrons. In August 1945, Australia had the fourth-largest air force in the world. Over 215,000 RAAF men and women served during the period 1939 to 1945. Of these, 9870 personnel lost their lives due to the war. Over 55 per cent of the Australian aircrew deaths occurred in the allied air war conducted against Germany over Europe.

Recent Conflicts and Peacekeeping

Air Force personnel have served with distinction in military air campaigns conducted over Korea, Malaya, Vietnam, the Indonesian ‘Confrontation’, Iraq, and Afghanistan. We are proud of our roles and achievements in peacekeeping and humanitarian assistance operations throughout the world, including Bougainville, Cambodia, East Timor, Fiji, Indonesia, Japan, Pakistan, Papua New Guinea, Philippines, Rwanda, Solomon Islands, Somalia, Sudan, Vanuatu, and Australian sovereign territory, in which many hundreds of RAAF personnel have been involved. Since 1945, over 60 RAAF personnel have lost their lives in operations-related incidents.

Today’s Air Force

Air Force is always ready to serve Australia. Working closely with Navy, Army, other government agencies and departments, and our regional friends and international partners, Air Force delivers air power around the globe. Air Force has partnerships with other Defence Groups and industry partners to generate and sustain its air power. Air Force personnel are required to master strategy, operations, tactics, engineering, logistics and support to ensure that Air Force generates and delivers appropriate and effective options for Government, using a range of integrated kinetic and non-kinetic air and space power effects across the sea, land, air, space, electromagnetic, and cyber domains—anywhere, at any time.

Since 1946, Air Force operations have responded to situations arising around the globe, as depicted in Figure 1. Recently international deployments have involved Air Force C-17A Globemaster III, C-130J Hercules, AP-3C Orion, F/A- 18A Hornet, F/A-18F Super Hornet, E-7A Wedgetail, KC-30A Multi-Role Tanker Transport, and appropriate personnel, logistics, and materiel. Additionally, Air Force tasks support a wide range of domestic operations, including the provision of air mobility and Intelligence, Surveillance and Reconnaissance (ISR) within peacetime Australia, space situational awareness of the Earth orbital environment, and support to a wide range of whole-of-government operations.

Recent operations have involved Air Force AP-3C Orion, C-130J Hercules and E-7A Wedgetail aircraft engaged in the search for Malaysian Airlines Flight MH370. Additionally, Air Force medical teams conduct aeromedical evacuations and disaster relief missions in Australia and in overseas locations with C-130J Hercules and C-17A Globemaster III.

Globally, on any day, Air Force may have between 500 and 700 people deployed on active duties in operations contributing to border protection, coalition operations, peacekeeping missions, humanitarian assistance and disaster relief. Recent Air Force history of overseas deployments include:

1. **Operation ACCORDIAN**: Australia’s military contribution to supporting operations
in the Middle East Region (MER) and neighbouring Gulf States.

2. **Operation GATEWAY**: Australia’s enduring contribution to the preservation of regional security and stability in Southeast Asia, including supporting Australian efforts to counter people smuggling in the region.

3. **Operation HIGHROAD**: Australia’s military contribution to the NATO-led mission to train, advise and assist the Afghan National Defense and Security Forces (ANDSF).

4. **Operation OKRA**: Australia’s military contribution to the fight against Daesh in Iraq and Syria.

5. **Operation RESOLUTE**: ADF contribution to the Whole-of-Government effort to protect Australia’s borders and offshore maritime interests.

6. **Operation SOLANIA**: ADF contribution to maritime surveillance within the Pacific Region to provide intelligence, surveillance and reconnaissance to Pacific Islands Countries that supports their economic development through the protection of fisheries and other resources.

7. **Operation ASLAN**: ADF contribution to the United Nations’ Mission in South Sudan (UNMISS) to protect the people of the Republic of South Sudan through the monitoring of human rights and the delivery of humanitarian aid.

8. **Operation AUGURY- PHILIPPINES**: ADF partnership activity with the Armed Forces of the Philippines focused on sharing experiences and approaches to countering complex urban terrorist tactics.
Figure 1. Royal Australian Air Force deployments 1946-Present

- **Malaysia** (1950–present)
- **UAE** (2008–present)
- **Qatar** (2003–08)
- **Somalia** (1993–96)
- **Rwanda** (1994–95)
- **South Sudan** (2011–present)
- **Sudan** (2005–present)
- **Berlin Airlift, Germany** (1948–49)
- **Malta** (1952–54)
- **Sinai** (1976–79 & 1982–86)
- **Sudan** (2005–present)
- **Bosnia & Herzegovina** (1997–2003)
- **Lebanon** (2006)
- **Berlin Airlift, Germany** (1948–49)
- **Iraq & Syria** (2003–present)
- **Pakistan** (2005 & 2010)
- **Japan** (1946–55 & 2011)
- **New Zealand** (2011)
- **Samoa** (2009)
- **Papua New Guinea** (1946–present)
- **Berlin Airlift, Germany** (1948–49)
- **Berlin Airlift, Germany** (1948–49)
- **Berlin Airlift, Germany** (1948–49)
- **Berlin Airlift, Germany** (1948–49)
Air Force Deployments: 1946 – Present

- **Korea** (1950–55)
- **Vietnam** (1964–71 & 1975)
- **Thailand** (1962–68)
- **Kashmir, India** (1975–79)
- **Pakistan** (2005 & 2010)
- **Afghanistan** (2001–Present)
- **Iraq & Syria** (2003–present)
- **Kashmir, India** (1975–79)
- **Sinai** (1976–79 & 1982–86)
- **Papua New Guinea** (1946–present)
- **Pakistan** (2005 & 2010)
- **Japan** (1946–55 & 2011)
- **Vietnam** (1964–71 & 1975)
- **Philippines** (2017–Present)
- **Cambodia** (1992–93)
- **New Zealand** (2011)
- **Samoa** (2009)
- **Bougainville** (1997–98)
- **Rwanda** (1994–95)
- **Somalia** (1993–96)
- **Cambodia** (1992–93)
- **New Zealand** (2011)
- **Samoa** (2009)
- **Bougainville** (1997–98)
FROM STRATEGIC TASKS TO FORCE DETERMINANTS

The 2016 Defence White Paper describes the strategic defence objectives agreed by the Australian Government in its expectations of the ADF:

- Deter, deny and defeat attacks on or threats to Australia and its national interests, and northern approaches.
- Make effective military contributions to support the security of maritime South East Asia and support the governments of Papua New Guinea, Timor-Leste and of Pacific Island Countries to build and strengthen their security.
- Contribute military capabilities to coalition operations that support Australia’s interests in a rules-based global order.

Air Force will structures its force to support the joint force to meet the strategic defence objectives.

Strategic Utility of Air Power

Being an island nation continent that is dependent on overseas trade for its prosperity, Australia is critically dependent on the sea, and the maritime environment, as a means to actively protect and promote Australia’s interests and influence strategic events in the region. That dependence, and the vulnerability of our air, data, and sea lines of communication, from interference that could damage the national economy and security, makes it essential that Australia can control its sea and air approaches (see Figure 2). Australia’s security hinges on a Maritime Strategy that requires sea, land and air forces to operate in concert to project power and control the air and sea approaches.

**Australia’s Maritime Strategy is underpinned by the Air Force ability to control the air in our sea and air approaches.**

**Air Force draws on its core roles of control of the air, strike, air mobility and ISR to provide Government with flexible and responsive air power options.**

Within the Maritime Strategy, Air Force remains prepared to offer Government a wide range of air power options to meet a variety of challenges, from supporting humanitarian operations or deterring aggression, through to taking offensive action in joint or coalition operations against a military threat. This requires an ongoing investment in maintaining the capabilities to conduct all our core air power roles as part of a joint force or coalition, or independently, depending upon the prevailing circumstances.

The employment of Air Force’s air power in conflict and other operations globally over the past quarter century illustrates air power's inherent agility. Although air power is most effective when used in offensive operations, Air Force’s agility and ability to exercise its roles in tailored combinations means that it has always been capable of creating a wide range of unique air power effects. These effects may be created at the strategic to tactical levels across the spectrum of conflict.

Australia’s Maritime Strategy requires naval, air and land forces to influence strategic events through the maritime environment by the astute application of their power. This requires safeguarding Australia’s air and sea approaches and the regional maritime commons. The ADF must be able
to: shape the security environment; deter actions inimical to our interest; or respond by denying, coercing or punishing any subversive actions in our area of strategic interests; or some combination of these. Because Australia’s maritime interests lie primarily in the Pacific, Indian and Southern Oceans, maritime, land and air power capabilities that can project power into and across these vast areas are fundamental components of Australia’s Maritime Strategy.

Air power has distinct characteristics such as perspective, speed, reach and flexibility that offer a unique range of options in support of national objectives. Air power can be applied with great speed over the great distances and diverse terrain that characterise our regional environment. It can be applied in one area, or concurrently over a number of operating areas. This can include concurrent air operations over maritime, littoral or land environments, in conflict, in peace operations and in humanitarian assistance/disaster relief.

The operational utility of air power can only be provided by a deliberately structured air force, with a balanced range and level of capabilities to meet our strategic needs. To remain credible and effective, Air Force must have a critical mass of modern air power systems and skilled personnel. That critical mass must be able to conduct and sustain the full breadth of actions necessary to protect our national interests, with the capacity to simultaneously conduct...
operations, maintain training and regenerate operational forces. Air Force must also have the mass to absorb operational losses without loss of effectiveness in extreme circumstances.

Failure to maintain an effective Air Force will inevitably restrict Australia’s national capacity to provide effective responses to emergent crises or conflict that affect our national interests.

**Air Force Strategic Tasks**

Air Force’s strategic tasks are built on the need to **shape** our environment, **deter** potential adversaries and, where necessary, **respond** to defeat emerging threats.

**Shaping Australia’s Security Environment**

Air Force’s contribution to shaping Australia’s security environment is based primarily on the activities it undertakes to engage other nations. Air Force plays an important part in ensuring Australia’s ongoing security, specifically through global engagement activities by, inter alia, participating in and hosting international exercises, and providing training and exchange opportunities. This is vital in promoting understanding and goodwill with a breadth of regional nations. This engagement develops the key relationships and capabilities that enable interoperability between the Air Force and regional air forces. These relationships contribute to Australia’s ability to respond in an expeditionary manner by enhancing our ability to conduct operations in partnership with regional nations, and facilitate our access to overseas bases in such instances.

**Deter Threats to National Interests**

By maintaining a capable and credible force at an appropriate posture, Air Force, in conjunction with the other Services, achieves a measure of deterrence without having to apply force. This effect is created through the combination of carefully selected and well-maintained systems that meet security demands, and the level of training provided to personnel in operations, exercises and training institutions. Deterrence is a long-term activity that requires sustainment of current capability whilst planning and implementing changes to Air Force’s structure, organisation and equipment to ensure credibility into the future. However, because the responses of potential adversaries can never be predicted with total certainty, Air Force maintains an agreed level of preparedness at all times to rapidly apply military air power in armed conflict if required.
Respond to Attacks or Threats to Australian Interests

By developing and maintaining a structured and balanced force, Air Force is prepared to contribute to a military response where deterrence has failed to dissuade an adversary whose actions continue to threaten national security interests. Such action could be in response to a direct attack or threat to Australian territory, personnel or resources. Alternatively, a crisis within the region may lead to a request for Australian intervention, most likely within a coalition. Responses may involve the use of force—short of armed conflict—such as the establishment of an overt military presence to prevent further adversary action, enforcement of sanctions, or providing support for diplomacy. These operations are invariably complex, challenging and often dangerous. Hence, they have the potential to demand the innovative and effective application of the full range of air power capabilities in support of the joint force.

Whole-of-Government Approach to National Security

Air Force provides air power options as an essential part of an Australian whole-of-government approach to national security, whether operating from Australia or from locations overseas. This requires Air Force to operate with a range of military forces and other government agencies, such as Department of Foreign Affairs and Trade. This approach also requires Air Force to work with a variety of other public and private sector elements as well as non-government organisations, industry, academic institutions and the commercial sector. Orchestrating the efforts of these agencies to achieve national security outcomes requires careful planning and a common basis for focusing activities and their coordinated application to achieve the desired objectives.
AIR FORCE – LEADING THE DELIVERY OF AIR POWER

Air Force Vision

The Royal Australian Air Force (RAAF) will become a fifth-generation Air Force, to provide integrated and networked air power options for the Australian Government. We will work with Army and Navy to ensure we deliver a networked future joint force across the spectrum of air, space, electromagnetic and cyber.

The vision describes what Air Force aspires to achieve and the type of force we will remain. Air Force will fight and win by rapidly generating integrated kinetic and non-kinetic air and space power effects across the sea, land, air, space and cyber domains.

Air Force will continue to exploit the air power characteristics of perspective, speed, reach, precision and flexibility, in order to ensure that we can deliver effective air power options when and where required by Government. We will achieve our vision now and into the future by acquiring, integrating and exploiting leading-edge air power systems and ensuring that they are operated by high-quality Air Force personnel who are well-trained, innovative and respected. Ongoing investment in such personnel and systems is vital to ensure that Air Force remains ready to complete its vital roles in Australia’s Maritime Strategy. As the challenges in our areas of interest become increasingly diverse and dangerous, investments in achieving Air Force’s vision are also essential to ensure that the force can better mitigate any limitations in its air power.

Achieving Air Force’s vision requires ongoing investment across the full breadth of its air power. We will only lead in the application of air power if we are trusted and respected as a leader in command and control of air and space operations; professional mastery of air power; Intelligence, Surveillance, and Reconnaissance (ISR); targeting; and the generation, employment and sustainment of military air power.

Through ongoing commitment to the achievement of its vision, Air Force will meet its strategic tasks, to shape, deter or respond to any exigency with resilience, in a swift and decisive manner.

Air Force Mission

Air Force provides integrated air power options for the Australian Government. Our people are innovative masters of the air domain, working alongside Army, Navy and coalition partners.

The purpose of the mission statement is to outline why Air Force exists.

Australia’s national interests are diverse, including a range of strategic partnerships with other nations who share our security goals, customers for our exports and suppliers of a range of products. They are also dispersed over an area that is vast geographically and includes nations who share our interests and nations whose interests may be at odds with our own. Such diversity has the potential to create challenges that may arise suddenly and be unpredictable in nature. To meet such challenges, Air Force is prepared to respond with effective air power where and when
threats to our interests arise and has the agility to adapt quickly to meet modern challenges that can continue to evolve as adversaries seek new ways to find weaknesses in our forces.

Air Force cannot rely on size and numbers alone to generate, employ, and sustain the military air power required to comprehensively safeguard the Nation’s security. Air Force’s enduring capacity to generate and employ responsive, potent and effective air power options whenever required by Government, must therefore be carefully crafted. Our force is built to a prudently considered size, with a critical mass of deliberately chosen systems, quality people, preeminent training, and robust support systems. Air Force is also united by the values of the force and this unity is maintained through continuous reviews of the ways we care for our personnel, in peace and conflict.

Air Force’s mission also requires that we support Government’s efforts to advance security in our region by contributing air power and demonstrating the capabilities of its systems and the skills of its personnel in these broad-ranging activities. Air Force also assists in deterring those whose interests are contrary to our own.

Figure 2. Spectrum of Conflict
Air Power

Air Force defines air power as:

...the ability of a nation to assert its will by projecting military power in, through, and from the air domain.

Australia’s national air power includes all the Nation’s fixed- and rotary-wing aviation and aviation-related resources, both military and civilian. Air Force’s air power includes systems that to deliver effects, or respond to effects, within the atmosphere, through the atmosphere to space-based systems, ground-based air surveillance and air defence systems. Military air power is primarily the responsibility of Chief of Air Force who is appointed as the Defence Aviation Authority responsible for the regulation and oversight of all aspects of military aviation.

Air Force provides the Government of Australia with military air power options across a spectrum of conflict (see Figure 2). Air Force also supports humanitarian assistance and disaster relief operations at home and abroad and makes important contributions in direct support of border protection and national domestic security imperatives. Air Force has also participated in a range of joint and coalition operations for the protection of national interests in major conflicts, while remaining prepared, should circumstances arise, to operate in wars of national survival.

Air power is considered to be an essential component of Australian national power. Together with land and sea power, it makes a vital contribution to the national effort to ensure the security of our nation, our people, and our interests. The contribution of air power to national security is an enduring mission that, regardless of technological advances or changes in our security circumstance, performs a number of essential roles. Some of these roles enhance or enable the activities of other elements of Australia’s national power.

Air Power Roles

Air Force exists to generate, employ, and sustain air power to defend Australia and its national interests. This is achieved through functionally organising air capabilities for air power roles, prepared to support a joint force in a joint campaign, and ready to respond across spectrum of conflict.

Australian air power is normally operated and deployed either from permanent bases established within Australia, or from forward expeditionary bases temporarily or permanently located in overseas locations. The effects generated by Air Force complement the effects created by the other services of the Australian Defence Force (ADF), as well as other elements of Australia’s national power.

Air Force has extensively analysed its history, to capture the lessons learned, and identify the fundamentals for successful air operations. At its highest level, Air Force has identified four core air power roles and three enabling air power roles as enduring functions for the effective application of Australian air power. These fundamental roles are prescribed in Australia’s air power doctrine to guide the Australian planning and employment of air power in future operations. These core and enabling air power roles are described in more detail in the following paragraphs.
Core Air Power Roles

Control of the Air
Control of the air is the ability to conduct operations in the air, land and maritime domains without effective interference from adversary air and air defence capabilities. This is Air Force’s pre-eminence role and is a precursor to the conduct of all other operations.

By assuring control of the air, Air Force enables control of the sea and contributes directly to all other military operations. Although control of the air will not guarantee success, failure to achieve adequate control will critically constrain the conduct of other operations. Air Force will normally lead the planning and conduct of the air operations to achieve control of the air, although land, maritime, and cyber forces may assist by conducting operations against an adversary’s aircraft and operating bases, and by suppressing their air defences.

Strike
Strike is the ability to attack with the intention of damaging, neutralising or destroying a target. Strike can be planned with, due regard for collateral damage, and conducted with weapons designed to deliver lethal or non-lethal effects against an adversary.

Australian air power employs a balanced inventory of conventional unguided weapons and precision weapons which provides flexibility in tailoring strike missions with the appropriate the cost, effort and risk appropriate to the necessary degree of accuracy, effectiveness, proportionality, discrimination, lethality and collateral damage. Precision allows Air Force to apply a decisive military force, while minimising the risk of collateral damage and unnecessary casualties.

Air Force’s strike capabilities are being broadened to complement traditional kinetic weapons with non-kinetic options, such as airborne electronic attack. Airborne electronic attack will electronically disrupt an adversary’s ISR sensor by jamming or placing of false information into their electronic systems. Our strike capabilities provide Australia with a unique politico-military instrument of force that can be tailored to swiftly and directly apply military power when and where required, creating the greatest strategic effect with the required degree of precision.

Air Mobility
Air mobility is the ability to move personnel and materiel using airborne platforms and is a significant component of ADF force projection capability from, or within, or between theatres of operations; air mobility also includes air-to-air refuelling. Air mobility is often the transportation of choice when speed, reach, terrain, and avoidance of ground and sea-based are defences are necessary. In some cases, air mobility may be the only viable response to create the desired effect when considering the mission payload and delivery time and distances involved.

The availability of modern long-range air mobility aircraft such as the C-17A Globemaster III, C-27 Spartan, KC-30A Multi-Role Transport Tanker, and commercial aviation, significantly enhances the capacity for Australian air power to conduct global airlift operations. This capability has proved vital to the rapid and long-range deployment and support of ADF forces overseas in conflicts and humanitarian operations.
Intelligence, Surveillance, & Reconnaissance (ISR)

The ISR role synchronises and integrates the planning and operation of sensors, assets, and processing, exploitation and dissemination systems in direct support of current and future joint operations. Operational requirements for ISR will steer the mission planning for aircraft and space-based ISR missions.

The fundamental mission objective of ISR is to enable decision superiority—the ability to make informed decisions faster than an adversary—by providing key pieces of data, processed information, and intelligence that the joint force to achieve battlespace awareness and understanding, information superiority, and thus, decision superiority.

Enabling Air Power Roles

Command and Control

The ADF describes the key enabling air power role of Command and Control (C2) as “... the process and means for the exercise of authority over, and lawful direction of, assigned forces.” The Air Force C2 role has unique features that reflect the nature of the air domain and the way that professional military personnel in Air Force operate and fight. The C2 role covers the planning of air campaigns within joint campaigns, the execution of the campaign and the targeting process.

Air Force C2 also includes the management of military air and space operations, airspace control, and Electronic Warfare Battlespace Management (EWBM). EWBM coordinates the use of non-kinetic options that exploit the Electro-Magnetic Spectrum (EMS). EWBM is needed to ensure that EMS operations do not adversely affect friendly activities. Air Force C2 also includes mechanisms to manage its Raise, Train, and Sustain (RTS) functions for its air power through the Air Force organisational structure and chain of command.

In Air Force, the structuring and tailoring of C2 for the optimal employment of assigned air power, is controlled from the Air and Space Operations Centre (AOC), at the Headquarters Joint Operations Command (HQJOC). In the execution of this function, Air Force applies the fundamental tenet of centralised control and decentralised execution: centralised control ensures the optimum application of effort where and when needed; decentralised execution provides operational and tactical level commanders with sufficient freedom to exercise professional expertise and initiative in carrying out their assigned missions.

Force Protection

Force protection includes all measures and means to minimise the vulnerability of personnel, facilities, materiel, information and operations to any threat from an adversary or operating environment, while preserving the freedom of action and the operational effectiveness of the force.

Air power has a degree of relative impermanence; air combat systems must return to a base at the end of a mission. Force protection is essential in air power operations, and during all phases of an air campaign, including the protection of scarce, expensive and fragile air power assets – including air combat systems and air bases. Protection of other valuable assets such as personnel and support systems, particularly when they are vulnerable on the ground, is also critical to assuring effective air operations.
Force Generation and Sustainment

Force generation and sustainment focuses on ensuring that the current force has the necessary personnel, skills and materiel to conduct and sustain the generation of air effects in joint operations to meet the foreseeable operational needs—both domestic and expeditionary—while maintaining the ability to regenerate the force during and after the cessation of operations. This role includes concurrent broader planning for the designs for the future Air Force and initiates actions to ensure the timely acquisition, introduction, and sustainment of air and space power capabilities, appropriate to the future needs of Australian air power.

Air Force Capability

Air Force conducts its air power roles with a suite of highly capable systems operated and supported by well-trained personnel. As well as becoming increasingly sophisticated, complex and expensive, these systems require a substantial whole-of-life investment in maintenance and upgrades to maintain the necessary levels of performance.

Modern systems are generally most effective when operated as part of a system of systems. For example, control of the air requires a range of complementary systems, such as fighter, air-to-air refuelling and early warning and control aircraft. These are supported by extensive ground- and space-based systems, and will increasingly be connected to systems of other Services and forces. Such support is essential for the operation of piloted aircraft as well as for unmanned aerial systems that are becoming an important element for Air Force.

The nature of Air Force’s capabilities means that forces deployed for operations will form and operate as a mix of capabilities tailored for each specific operation. This mix will be determined on the basis of a range of factors such as the nature of the mission, speed of required response, threat and environment. Whether a deployment is relatively simple, such as providing assistance to low-level relief operations, or deployment of a large, complex force for combat, any deployment will demand extensive planning for operational, logistic, personnel and maintenance arrangements.

The ADF describes the building blocks of capability through the construct of fundamental inputs to capability (FIC), namely: personnel, organisation, collective training, major systems, supplies, facilities and training areas, support and command and management. For Air Force to deliver effective, responsive air power options, all elements of its FIC must be resourced and supported appropriately. Air Force personnel are vital to supporting and operating our FIC and they must be recruited and trained to satisfy a wide breadth of occupations and specifications. Generating and sustaining these personnel is just as critical as maintaining and operating the highest level of air power systems.

Transforming the Air Force

Air Force is currently undergoing the greatest capability transition in its history. By 2030, not only will almost every single aircraft in Air Force’s fleet have undergone a systems upgrade, or have been replaced, we will also have introduced new platforms delivering new capabilities in emerging mission types.

Much of this capability upgrade will modernise existing systems. However, Air
Force will continually seek ways to utilise emerging and disruptive technologies and concepts that arise during our capability transition. Air Force will also seek to protect our forces against a potential adversary’s use of such technologies. Within the needs phase of the capability development cycle, assisted by Defence Science and Technology Group (DSTG), Air Force will explore opportunities and seek to understand the threats inherent in these developments.

The changing nature of our capabilities, and the environments they will operate within, requires that Air Force undertake a process of transformation. Our new systems, and the organisational structures we will operate them within, have enormous potential to change the way we will fight in the future. Future wars will take place in an environment that is dangerous, complex, ambiguous and contested. For any force to prevail in this environment it must be agile and adaptive, capable of adjusting to the requirements of the environmental context. Delivery of the required joint effects will likely involve multi domain systems, used in a highly coordinated and integrated way, in a dynamic command and control construct. In preparing for this future fight, our three guiding themes will be harnessing the combat potential of an integrated force, developing an innovative and empowered workforce, and changing the way we acquire and sustain capability.

Air Force’s transformation will be guided by the Air Force Strategy, Plan Jericho, and subsequent Air Force plans. Plans will cyclically reassess a range of factors such as technology, the strategic environment, and emerging threats. They will measure our current capability state and generate input into the strategic framework and capability plans of action. These concepts and plans will deliver integrated warfighting capabilities that will increase the lethality and survivability of the whole force.

Plan Jericho is a strategy designed to transform the Royal Australian Air Force by capitalising on future high technology systems.

Plan Jericho, launched in early 2015, is a suite of activities in operations, personnel and capability that will create the Air Force of the future. Plan Jericho is Air Force’s plan to transform into a fully integrated force that is capable of fighting and winning in the information age. The 2015 Plan Jericho Program of Work was updated in June 2016, detailing 16 initiatives to be actioned under the leadership of Deputy Chief of Air Force (DCAF) and Air Commander Australia (ACAUST) through accountable Air Force senior leaders. The lead Plan Jericho initiative was the establishment of an Air Force Air Warfare Centre (AWC).

The transformation will touch all aspects of Air Force’s operations. It will require an integrated systems approach where the refueller is given as much consideration as the fighter pilot, resulting in a balanced force supported by fully realised single-service and joint enabling capabilities. A requirement of the transformation is investment in specialist skill sets. Some of these will be traditional and understood, while others will need to be created to deliver new functions in support of new concepts.

As regional militaries continue to modernise, Air Force will only retain its capability edge through superiority in a few key areas. These areas are likely to be decision superiority, training, and by fully realising our enabling systems. ISR will be essential...
to decision superiority. We will need to build governance systems that can drive system performance across a number of groups and services. Most importantly we will develop a culture that allows us to get beyond the issue of Service ownership, enabling us to achieve truly joint and integrated effects.

As technology evolves and environments change, Air Force strategies and tactics will need to develop in response. Air Force will continue to develop its professional mastery of air power by adapting, refining and updating its doctrine, concepts, education and training. Air Force will continue its tradition of service to the highest standard—continuing to embrace emerging technology and offer responsive military air power options to Government for the defence of Australia and its national interests. We will carefully transform the force to achieve our vision.

The Networked Fifth-Generation Air Force

A fifth-generation Air Force will provide the necessary strength to win against the increasingly complex and lethal threats of warfare in the Information Age.

It is Air Force’s intention to become a fifth-generation Air Force. Fifth-generation refers the latest technological evolution of aircraft. The fifth-generation Air Force will be a fully-networked force that exploits the advantages of an available, integrated, and shared battlespace picture, available for use by all combat elements in the task force, to better deliver lethal and non-lethal air power.

While the reference to the different generations is traditionally meant in reference to the generation of the fighter jet design, Air Force is applying this term in reference to the objective of a networked force design for Air Force. Additionally, using this fifth-generation concept as a change driver, also means that our people working with all aircraft and systems need to be trained, educated and equipped to become professional masters of air and space power in the new fifth-generation force.
Generations of Fighter Aircraft

**First-Generation Fighter:** Jet fighters of the immediate post-Second World War and Korean War period.

**Second-Generation Fighter:** Fighters with sustained transonic or supersonic dash capabilities, rudimentary fire control radars and infra-red-guided air-to-air missiles.

**Third-Generation Fighter:** By the late 1950s and 1960s, fighters were capable of sustained supersonic flight, carried improved fire control radars and semi-active-radar air-to-air missiles, as well as the first generation of tactical electronic warfare systems.

**Fourth-Generation Fighter:** By the 1970s, fighters employed more efficient and powerful turbofan jet engines, ‘look-down’ Doppler fire-control radars, fly-by-wire flight control systems providing high agility, integral and podded electro-optical/infra-red targeting sensors, laser and GPS-guided precision weapons, active-radar air-to-air missiles, head-up displays and improved electronic warfare systems. Although nearing their planned withdrawal date, this generation of fighters has endured the longest.

**Fifth-Generation Fighter:** Those aircraft are more advanced than later 4th-generation aircraft and have features such as designed-in low observable shaping and materials, internal weapons bays and a high degree of situational awareness through integrated sensors and networking. To date, the only operational fifth-generation aircraft in operational service with western air forces are the US Air Force F-22A Raptor and the F-35A Lightning II which is entering RAAF service in 2018/19.

Note: There are a few aircraft that have evolved to the point where some of their capabilities span the gap between the fourth- and fifth-generation categories, such as the Super Hornet. These aircraft are referred to as ‘4.5-generation’ fighters.
AIR FORCE: TODAY’S AIR POWER

Organisation

Organisation of RAAF Bases
The Air Force is commanded by the Chief of Air Force (CAF) and has a complement of about 14,200 uniformed members, supported by about 4,400 Air Force Reservists and 770 Australian Public Service (APS) employees. Air Force personnel also serve in positions located across other areas of the Defence organisation and in overseas positions in representational appointments, liaison positions, and exchange postings. Figure 3 shows the location of Air Force bases and headquarters throughout Australia.

Command of the RAAF
CAF commands the RAAF through two principal executives—DCAF and ACAUST—as shown in Figure 4. DCAF leads Air Force Headquarters (AFHQ), the organisation through which CAF commands Air Force at the strategic level, including responsibilities such as managing strategic planning, policy development and capability planning. ACAUST leads Headquarters Air Command (HQAC), which is responsible for the conduct of Air Force’s operations and the RTS function that ensures Air Force combat capabilities are at the levels of preparedness...
directed by CAF for assignment to operations.

Below these two headquarters, Air Force is organised into operational, support and training formations located at a range of Defence offices and major air bases established across Australia.

**Structure of Air Force Formations**
The generic structure of Air Force’s formations is based on a hierarchical organisation of groups, wings, squadrons and sections, organised along functional lines. While there are likely to be variations in the shape of each formation within a type, the basic structural principles listed at Table 1 generally apply.

The highest level of formation is the Force Element Group (FEG), comprising a headquarters and one or more wings. The FEGs are responsible for specific capability components. For example Air Mobility Group (AMG) is responsible for the Air Force’s air mobility capability.

Wings are the operational elements of Air Command. Each wing is made up of two or more squadrons plus the wing headquarters.

Squadrons are the core tactical elements around which the Air Force operates. Each squadron is responsible for an output, support function or aircraft. For example, No 11 Squadron is responsible for maritime operations with employment of the P-8A Poseidon maritime patrol aircraft. The flying squadrons are different sizes, depending on aircraft type and role. A flying squadron will generally contain between about five to 20 aircraft. Combat Support Squadrons include the broad range of personnel and equipment necessary to establish and operate forward air bases and to operate some permanent air bases.

![Figure 4: CAF's Principal Executives and Command Chain](image-url)
Deploying Air Force’s Air Power
The broad range of Air Force personnel and systems required to conduct and support air operations means that Air Force is unlikely to deploy forces for operations as a single squadron, or elemental formation. Rather, Air Force contribution will generally comprise a force drawn from across a range of formations to provide a contextual operational and support capability for the circumstance. For example, a force deployed for air combat operations generically requires air combat aircraft such as the F/A-18A and a range of other elements including air base operating and security personnel, surveillance and control aircraft, air-to-air refuelling aircraft and a range of command and logistics support forces.

Relationships with Non-Air Force Groups
Air Force relies on the support of a number of non-Air Force groups to generate, employ and sustain air power. CAF commands permanent and reserve Air Force members employed in non-Air Force groups. Air Force has a close relationship with these groups and liaises extensively to maintain a shared understanding of its requirements and to ensure the development and management of the robust support mechanisms that are essential to sustain air power operations in peace and conflict.

Common Joint Staff System
When Air Force members are assigned to work within a joint or operational level headquarters, the Common Joint Staff System, depicted at Table 2, provides titles for staff positions and functional divisions of responsibility. The letter designator at the start of the title indicates the environment of the headquarters. The first digit after the letter designator indicates the branch in which the member works. Subsequent digits indicate functions and individual staff positions within a branch.

<table>
<thead>
<tr>
<th>Formation</th>
<th>Commander</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australian Defence Force</td>
<td>Chief of Defence Force (CDF)</td>
<td>Air Chief Marshal</td>
</tr>
<tr>
<td>Air Force</td>
<td>Chief of Air Force (CAF)</td>
<td>Air Marshal</td>
</tr>
<tr>
<td>Air Force Headquarters Head</td>
<td>Deputy Chief of Air Force (DCAF)</td>
<td>Air Vice-Marsh</td>
</tr>
<tr>
<td>Branch</td>
<td>Air Commander Australia (ACAUST)</td>
<td>Air Commodore</td>
</tr>
<tr>
<td>Directorate</td>
<td>Director General</td>
<td>Group Captain</td>
</tr>
<tr>
<td>or Centre</td>
<td>Director</td>
<td>Wing Commander</td>
</tr>
<tr>
<td>Unit or Team</td>
<td>Deputy Director</td>
<td>Squadron Leader</td>
</tr>
<tr>
<td>Squadron (Force Element)</td>
<td>Staff Officer</td>
<td>Flight Commander</td>
</tr>
<tr>
<td>Flight</td>
<td></td>
<td>Officer-in-Charge</td>
</tr>
<tr>
<td>Section</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1. Formations, Commanders, and Ranks
### Table 2. Joint Staff appointment designations.

<table>
<thead>
<tr>
<th>Staff Appointment</th>
<th>Headquarters Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Joint</td>
</tr>
<tr>
<td>Commander</td>
<td>J00</td>
</tr>
<tr>
<td>Chief of Staff</td>
<td>J01</td>
</tr>
<tr>
<td>Deputy Commander</td>
<td>J02</td>
</tr>
<tr>
<td>Resource/Financial Adviser</td>
<td>J05</td>
</tr>
<tr>
<td>Senior Legal Officer</td>
<td>J06</td>
</tr>
<tr>
<td>Senior Health Officer</td>
<td>J07</td>
</tr>
<tr>
<td>Senior Chaplain</td>
<td>J08</td>
</tr>
<tr>
<td>Personnel</td>
<td>J1</td>
</tr>
<tr>
<td>Intelligence</td>
<td>J2</td>
</tr>
<tr>
<td>Current operations</td>
<td>J3</td>
</tr>
<tr>
<td>Logistics</td>
<td>J4</td>
</tr>
<tr>
<td>Plans</td>
<td>J5</td>
</tr>
<tr>
<td>Communications and Information Systems</td>
<td>J6</td>
</tr>
<tr>
<td>Doctrine and training</td>
<td>J7</td>
</tr>
<tr>
<td>Force structure and development</td>
<td>J8</td>
</tr>
<tr>
<td>Civil/Military Cooperation (CIMIC)</td>
<td>J9</td>
</tr>
</tbody>
</table>

**Notes:**
- Some branches may be merged, for example personnel and logistics branches are commonly merged and use the title J1/4 in a joint headquarters.
- Army battalion-level headquarters staff use the letter designator S.
- In communications outside of the headquarters organisation, the title of a position is followed by the name of the headquarters (eg J01 HQJOC).
- The appointment title may also be followed by an abbreviation to indicate functional responsibility (eg J31 AIR, G52 ARTY or N43 TPT).
Air Force Headquarters

AFHQ Function

Air Force Headquarters (AFHQ) is responsible for the overall management of the personnel element of Air Force capability and provides capability management, strategic planning for current and future resources, force structure and facilities/infrastructure planning, policy advice and development of philosophical air power doctrine. AFHQ and its agencies also manage and conduct the interaction between Air Force, the other Services, other Defence groups, industry and contractors, other government agencies and Government.

The AFHQ organisation includes the agencies that are responsible for safety, airworthiness, and aviation capability improvement. These directorates and agencies have dual responsibilities to Air Force and ADF.

AFHQ Organisation

Office of Chief of Air Force. The Chief of Air Force (CAF) is responsible for the delivery of Air Force capability for the defence of Australia and its interests. This includes the delivery of aerospace capability, enhancing the Air Force’s reputation, and positioning the Air Force for the future. CAF is also appointed as the Defence Aviation Authority with accountability to the Chief of the Defence Force and Secretary of the Department of Defence for the regulation and oversight of all aspects of Defence Aviation. The Office of CAF also supports the following Air Force executive appointments:

- Deputy Chief of Air Force (DCAF). DCAF is responsible to CAF and manages the AFHQ executive sub-group, Air Force doctrine, policy and planning for current and future Air Force activities; and decisions on Air Force priorities.

- Warrant Officer of the Air Force (WOFF-AF). WOFF-AF is responsible for advising and assisting the Chief of Air Force and Commanders on the morale, work-life, and general welfare of airmen and airwomen.

Strategy and Planning. Director General Strategy and Planning—Air Force (DGSP-AF) is responsible for providing advice and staff support to Air Force in regards to corporate governance, future organisational structure and force designs, air and space power concepts, testing and experimentation of new concepts and capability options and the overseas engagement programs for managing international airmen-to-airmen relationships. DGSP-AF is also responsible for the Air Power Development Centre outputs for delivering education, information, doctrine, and future outlooks for air and space power technology.

Air Combat Capabilities. Director General Air Combat Capabilities—Air Force (DGACC-AF) is responsible for providing advice on the Air Force outcomes with current Air Force capabilities and the strategic management of Air Force capabilities, including major air combat systems, supplies, and support. DGACC-AF implements Government, Defence and Air Force policy for delivering timely and responsive advice on the implications of such policies. In respect of Air Force and military capabilities for the force-in-being and the future force, DGACC-AF is also responsible for the recommendation of affordable options to meet the requirements of the today’s Air Force needs and the needs of the future Air Force. DGACC-AF liaises extensively with other Defence programs, Capability
Acquisition & Sustainment Group, Defence Science Technology Group, and Defence Industry.

**Air Combat Enabling Capabilities.** Director General Air Capability Enablers - Air Force (DGACE-AF) reports to the Deputy Chief of Air Force. DGACE-AF complements DGACC-AF as one of two Air Force Program Sponsors responsible for managing all of the capability programs that CAF is the Capability Manager for under the Capability Life Cycle work stream. DGACE-AF liaises extensively with other Defence programs, Capability Acquisition & Sustainment Group, Defence Science Technology Group, and Defence Industry.

**Logistics.** Director General Logistics - Air Force (DGLOG-AF) manages the Directorates of Supply and Technical Capability. These Directorates are jointly responsible for the planning, coordination and evaluation of Air Force supply, engineering and maintenance management and governance functions. The Logistics Branch role includes developing and maintaining Air Force engineering, maintenance and supply support doctrine, developing policy and defining Air Force's logistic requirements; providing advice on infrastructure and Defence estate; and overseeing infrastructure development, planning and support for all Air Force bases, estate and properties of interest to Air Force. Logistics Branch also provides oversight of strategic planning for operations through life support of Air Force's systems.

**Personnel.** Director General Personnel–Air Force (DGPERS-AF) is responsible for providing an integrated full- and part-time, military and civilian workforce for Air Force to meet Australia's air power capability requirements. The Personnel Branch function includes planning to ensure the future workforce has the requisite skills; developing and managing Air Force personnel and career management policies; the allocation of Permanent and Reserve personnel to constrained establishments internal to Air Force and wider groups; professional development; and the refinement of Air Force personnel policies and systems, appointments, promotions and postings.

**Finance.** The role of the Assistant Secretary Finance - Air Force (ASF-AF) is to provide financial and business advice to CAF, DCAF and the wider Air Force. ASF-AF is also responsible for managing Air Force resources to achieve the best outcome for Air Force and Defence. Air Force resources are broken into two sub groups - Combat and Executive. ASF-AF coordinates the two groups and is the financial manager for the Executive Sub-Group on behalf of DCAF.

**Chief of Staff.** Chief of Staff (COS) Branch underwrites the staff work, capability planning and resource management framework within and across AFHQ. The Chief of Staff is responsible for controlling AFHQ staff effort in support of DCAF and integrating that effort across HQAC and AFHQ. This role includes: oversight for corporate and community relations such as incident management and on-line engagement; events management such as air shows and conferences; strategic communications and public affairs, including branding and reputation management; heritage management; Air Force uniforms and entitlements; legal; management of two City Squadrons; and Air Force Improvement program. COS Branch manages the following Air Force elements:

- **No 28 (City of Canberra) Squadron.** No 28 Squadron is based in Canberra to
Air Force Strategy
2017-2027

Air Force Capability Guidebook
2019

- **Air Force New Horizon Program.** The New Horizon program and Air Force Values were launched in September 2012 to address a complex range of reform across the areas of safety, efficiency, leadership, values, and more broadly, culture. New Horizon is Air Force’s overarching program delivering Pathway to Change outcomes. The New Horizon program focuses on improving behaviour, diversity, and inclusiveness in the workplaces of Air Force personnel.

**Chaplaincy.** Director General Chaplaincy-Air Force (DGCHAP-AF) is responsible for ensuring a quality chaplaincy presence within Air Force. The Director General’s roles include capability management, organising, supporting and working with churches to identify future chaplains, as well as constantly working at up-skilling the chaplaincy service. The Director General works closely with Air Force and Defence agencies and various faith groups to influence policy and services to provide for the welfare and wellbeing of Air Force people and their families.

**Reserves.** The Director General Reserves–Air Force (DGRES-AF) is responsible for providing CAF advice on the delivery of current and future reserve capability to Air Force. The directorate is also responsible for the strategic management of the Air Force reserve capability, excluding personnel aspects, and for liaison with other groups and divisions across the ADF, in particular Head Reserve Policy and Corporate Services Infrastructure Group. Reserves Branch is structured to deliver policy, strategic planning, capability development and organisation in support of Air Force priorities.

**Health Services.** Director General Air Force Health Services (DGAFHS) provides specialist health advice to the Air Force senior leadership team.

**Health Reserves.** The Director General Health Reserves - Air Force (DGHLTHRES-AF) is responsible to CAF, and the Surgeon General ADF Reserves, for the management of the Air Force Health Reserve capability, including the recruitment and sponsorship of members.

**Australian Air Force Cadets.** Cadets Branch–Air Force (CB-AF) is responsible for the administration of the Australian Air Force Cadets (AAFC) on behalf of CAF. The AAFC is an aviation-focused youth organisation sponsored by Air Force, and has a heritage that can be traced to the 1940s. Activities undertaken by the AAFC include flying, field craft, adventure training, firearms safety training, drill and ceremonial, service knowledge, aeromodelling, navigation and gliding. The contemporary aim of the AAFC is to foster qualities that will enable cadets to become responsible young adults, who will make a valuable contribution to the community.

**History and Heritage.** The Director General History and Heritage-Air Force (DGHH-AF) is responsible for the collection, study, and the preservation and management of records, artefacts and estate from the Australian Flying Corps to today’s Air Force. These activities are to enhance capability and reputation, while meeting Government and community expectations, as seen with the static aircraft shown on permanent public display around at some air bases,
Defence Aviation Safety Authority. Defence Aviation Safety Authority (DASA) is responsible for enhancing and promoting the safety of military aviation. This objective is primarily achieved through implementation of a Defence Aviation Safety Program (DASP) that supports compliance with statutory safety obligations and assures the effective management of aviation safety risks.

Air Command

Air Command Function
HQAC is the operational level headquarters responsible for generating and supporting Air Force capabilities for employment on operations, and developing and delivering the capability to command and control air operations. HQAC staff support Air Commander Australia (ACAUST) in the execution of relevant command responsibilities for the generation of Australian air power.

Office of Air Commander Australia
ACAUST is responsible to CAF for managing the operational air capabilities of Air Force. ACAUST commands Air Force operations, and is responsible for the activities necessary to Raise, Train & Sustain (RTS) forces to be prepared and ready to deliver effective air and space power when assigned to ADF joint operations. ACAUST exercises command of Air Command through Headquarters Air Command (HQAC).

ACAUST reports directly to CAF on all aspects relating to the delivery of Air Force capability to meet tasks directed by CAF and Chief of Joint Operations (CJOPS). ACAUST and DCAF both coordinate and synchronise their responsibilities to ensure that the desired Air Force capability and operational outcomes are realised. ACAUST is also responsible for peacetime national tasks for which the Air Force has enduring responsibility. Such tasking includes VIP air transport, Air Force Air Traffic Control (ATC) services, through to supporting domestic aviation activities and specific surveillance operations.

Headquarters Air Command
HQAC, located in Glenbrook, NSW, is responsible for the overall management of Air Command capability on behalf of ACAUST. HQAC is organised around the common joint staff system (see Table 2). ACAUST commands Air Command through two one-star deputies, Deputy ACAUST (DACAUST) and Director-General Air Command Operations (DGACOPS) who are each responsible for performing separate assigned functions in air command activities.

DACAUST is responsible for A1-Personnel, A7-Training, A8-Development, A9-Maintenance, A10-Air Base Capability, and acting as ACAUST’s Chief of Staff.

DGACOPS is responsible for A2-Intelligence, A3/5-Operations & Plans, A4-Logistics, A-6 Communications and Information Systems, and for Air Force air support to Army.

Air & Space Operations Centre
ACAUST also commands the Headquarters Joint Operations Command (HQJOC) Air & Space Operations Centre (AOC). The AOC controls daily Air Force and joint air operations. This includes planning, coordinating, controlling, monitoring, reporting and supporting the generation and the employment of air and space
power on behalf of CJOPS; maintaining an overview of all Air Command flying or ground activities and monitoring Air Force RTS activities.

DGACOPS appointment serves a dual-hatted responsibility as both Director General Air (DGAIR) within the HQJOC staff under the CJOPS and as DGACOPS within the HQAC organisation under ACAUST. The AOC is the primary portal between AFHQ, HQAC, and HQJOC for matters relating to the assignment of Air Force elements to CJOPS and the subsequent employment and sustainment of assigned Air Force elements for operations and exercises.

The AOC is located with the HQJOC in Bungendore, New South Wales.

**Air Command Organisation**

Air Command comprises a headquarters that provides command over Air Force combat elements that have been organised into six Force Element Groups (FEGs), as summarised in Table 3 and described in more detail later in this guide.

- Air Combat Group (ACG),
- Air Mobility Group (AMG),
- Surveillance and Response Group (SRG),
- Air Force Training Group (AFTG),
- Combat Support Group (CSG), and
- Air Warfare Centre (AWC).

**Force Element Groups**

The Air Force disposition of capabilities is organised into a hierarchical structure based on assigning discrete capabilities to separate units as Force Elements, which in turn are aggregated into Force Element Groups, as depicted in Table 3 below.
## AIR COMBAT GROUP

Roles: control of the air and strike

Headquarters ACG  
RAAF Base Williamtown (WLM)

- No 76 Squadron (Hawk 127)  
  RAAF Base Williamtown
- No 79 Squadron (Hawk 127)  
  RAAF Base Pearce
- No 278 Squadron  
  (Technical Training)  
  RAAF Base Amberley

Headquarters No 78 Wing  
RAAF Base Williamtown

- No 2 Operational Conversion Unit (F/A-18A/B Hornet)  
  RAAF Base Williamtown
- No 3 Squadron  
  (F/A-18A/B Hornet)  
  RAAF Base Williamtown
- No 75 Squadron  
  (F/A-18A/B Hornet)  
  RAAF Base Tindal
- No 77 Squadron  
  (F/A-18A/B Hornet)  
  RAAF Base Williamtown

Headquarters No 81 Wing  
RAAF Base Williamtown

- No 1 Remote Sensor Unit (E-7A)  
  RAAF Base Williamtown

Headquarters No 82 Wing  
RAAF Base Amberley

- No 1 Squadron  
  (F/A-18F Super Hornet)  
  RAAF Base Amberley
- No 4 Squadron (PC-9/A FAC)  
  RAAF Base Williamtown
- No 6 Squadron  
  (EA-18G Growler)  
  RAAF Base Amberley

## AIR MOBILITY GROUP

Role: air mobility

Headquarters AMG  
RAAF Base Richmond (RIC)

- No 34 Squadron (VIP) (737 BBJ, CL 604 Challenger)  
  Defence Establishment Fairbairn
- No 35 Squadron (C-27J)  
  RAAF Base Richmond
- No 37 Squadron (C-130J)  
  RAAF Base Richmond
- No 285 Squadron  
  (Operational Conversion)  
  RAAF Base Richmond

Headquarters No 84 Wing  
RAAF Base Richmond

- No 33 Squadron (KC-30A)  
  RAAF Base Amberley
- No 36 Squadron (C-17A)  
  RAAF Base Amberley
- Air Mobility Training Development Unit (AMTDU)  
  RAAF Base Richmond
- Air Mobility Control Centre (AMCC)  
  RAAF Base Richmond

## SURVEILLANCE AND RESPONSE GROUP

Roles: surveillance, reconnaissance, airspace management, maritime response

Headquarters SRG  
RAAF Base Williamtown (WLM)

- No 10 Squadron (AP-3C/Triton)  
  RAAF Base Edinburgh
- No 11 Squadron (P-8A)  
  RAAF Base Edinburgh
- No 292 Squadron  
  (Operational Conversion)  
  RAAF Base Edinburgh

Headquarters No 41 Wing  
RAAF Base Williamtown

- No 1 Remote Sensor Unit  
  RAAF Base Edinburgh
- No 3 Control & Reporting Unit  
  RAAF Base Williamtown
- No 114 Mobile Control & Reporting Unit  
  RAAF Base Darwin

Headquarters No 42 Wing  
RAAF Base Williamtown

- No 2 Squadron (E-7A)  
  RAAF Base Williamtown

Headquarters No 44 Wing  
RAAF Base Williamtown

- Headquarters No 452 Squadron  
  (Air Traffic Control)  
  RAAF Base Williamtown
- Headquarters No 453 Squadron  
  (Air Traffic Control)  
  RAAF Base Williamtown

Headquarters No 92 Wing  
RAAF Base Edinburgh

- No 10 Squadron (AP-3C/Triton)  
  RAAF Base Edinburgh
- No 11 Squadron (P-8A)  
  RAAF Base Edinburgh
- No 292 Squadron  
  (Operational Conversion)  
  RAAF Base Edinburgh
<table>
<thead>
<tr>
<th>AIR FORCE TRAINING GROUP</th>
<th>Role: personnel training</th>
<th>Headquarters AFTG RAAF Base Williams (WIL)</th>
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<tbody>
<tr>
<td>Headquarters Ground Training Wing, RAAF Base Williams</td>
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<tr>
<td>- Defence Explosive Ordnance Training School (DEOTS) Orchards Hills, NSW</td>
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<tr>
<td>- RAAF School of Administration &amp; Logistics Training (RAAFSALT) RAAF Base Wagga</td>
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<tr>
<td>- RAAF Security &amp; Fire School (RAAFSFS) RAAF Base Amberley</td>
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<tr>
<td>- RAAF School of Technical Training (RAAFSTT) RAAF Base Wagga</td>
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<tr>
<td>Headquarters Air Training Wing, RAAF Base Williams</td>
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<tr>
<td>- Defence Aviation Academy</td>
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<td>- No 1 Flying Training School (1FTS)</td>
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<tr>
<td>- No 2 Flying Training School (2FTS) (P/C-9A) RAAF Base Pearce</td>
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<tr>
<td>- Air Mission Training School</td>
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<td>- No 32 Squadron (KA 350) Tamworth, NSW</td>
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<td>- Central Flying School (CFS)</td>
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<td>- Combat Survival Training School (CSTS) RAAF Base Townsville</td>
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<td>- RAAF Museum Point Cook, Victoria</td>
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<tr>
<td>- School of Air Traffic Control (SATC)</td>
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<tr>
<td>RAAF College, RAAF Base Wagga</td>
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<tr>
<td>- Headquarters RAAF College (HQRAAFCOL)</td>
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<td>- No 1 Recruit Training Unit (1RTU)</td>
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<td>- Officers’ Training School (OTS)</td>
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<td>- RAAF Base East Sale</td>
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<tr>
<td>- School of Postgraduate Studies (SPS)</td>
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<td>- Air Force Band (AFBAND)</td>
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<tr>
<td>- RAAF Base Williams</td>
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<tr>
<td>- No 31 Squadron, Wagga Wagga NSW</td>
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<tr>
<th>COMBAT SUPPORT GROUP</th>
<th>Role: air base operation support services</th>
<th>Headquarters CSG RAAF Base Amberley (AMB)</th>
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<tbody>
<tr>
<td>Headquarters No 95 Wing RAAF Base Amberley</td>
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<tr>
<td>- Nos 1, 2 and 3 Security Forces Squadrons</td>
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<td>- No 1 Combat Communications Squadron</td>
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<td>- No 65 Squadron (Air Base Recovery)</td>
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<td>- No 295 Squadron (Operational Conversion)</td>
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<tr>
<td>- Nos 381, 382 and 383 Squadrons (Contingency Response)</td>
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<tr>
<td>Headquarters No 96 Wing RAAF Base Amberley</td>
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<tr>
<td>- No 13 Squadron, Darwin NT</td>
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<td>- No 17 Squadron, Tindal NT</td>
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<td>- No 19 Squadron, hosted by RMAF Butterworth, Malaysia</td>
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<td>- No 20 Squadron, Woomera SA</td>
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<td>- No 21 Squadron, Point Cook VIC</td>
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<td>- No 22 Squadron, Sydney NSW</td>
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<td>- No 23 Squadron, Amberley QLD</td>
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<td>- No 24 Squadron, Edinburgh SA</td>
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<td>- No 25 Squadron, Pearce WA</td>
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<td>- No 26 Squadron, Williamtown NSW</td>
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<td>- No 27 Squadron., Townsville and Scherer QLD</td>
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<td>- No 29 Squadron, Hobart TAS</td>
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<td>- No 30 Squadron, East Sale VIC</td>
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<td>- No 31 Squadron, Wagga, NSW</td>
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<tr>
<th>AIR WARFARE CENTRE</th>
<th>Role: deliver integrated air warfighting solutions for superior combat effectiveness</th>
<th>Headquarters AWC RAAF Base Edinburgh (EDN)</th>
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<tbody>
<tr>
<td>Test and Evaluation Directorate RAAF Base Edinburgh</td>
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<tr>
<td>- Aircraft Research and Development Unit (ARDU)</td>
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<tr>
<td>- Air Warfare Engineering Squadron (AWE SQN)</td>
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<td>- Institute of Aviation Medicine (IAM)</td>
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<tr>
<td>- Aeronautical Information Service – Air Force (AIS-AF) (Victoria Barracks, Melbourne) Information Warfare Directorate RAAF Base Edinburgh</td>
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<tr>
<td>- Joint Electronic Warfare Operational Support Unit</td>
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<tr>
<td>- No 87 Squadron (Air Force Mission Intelligence)</td>
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<tr>
<td>- No 460 Squadron (Targeting) Russell Offices, Canberra</td>
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<td>- No 462 Squadron (Information Assurance/Defensive Cyber)</td>
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<tr>
<td>- Air Intelligence Training Unit</td>
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| Air Force Ranges Directorate RAAF Base Edinburgh |
| - Air Force Air Weapon Ranges (AWR) |
| - Live, Virtual and Constructive (LVC) simulation |
| - Air Force Test Ranges Squadron |

| Tactics and Training Directorate RAAF Base Edinburgh |
| - No 88 Squadron (Integrated Tactics development) |
| - RAAF Base Williamtown |
| - Air Warfare School |
| - (Advanced warfare training) |

*Table 3. Air Command comprises six Force Element Groups.*
Air Combat Group

Air Combat Group (ACG) is responsible for delivering Australia’s capability to control the air and conduct precision strike and electronic attack. To achieve this, ACG operates a fleet of modern air combat and training aircraft to ensure it develops and maintains the ability to defend, or engage and destroy, designated air, land, sea, and electronic targets.

ACG employs approximately 2220 personnel, including aircrew and aircraft technical maintenance personnel, at air bases across Australia. The group is responsible for Air Force aircraft squadrons of F/A-18A/B Hornet, F/A-18F Super Hornet, EA-18G Growler, Hawk 127 Lead-In Fighter, F-35A Lightning II, and also forward air and ground control operations utilising Pilatus PC-9/A aircraft.

As shown in Figure 5, ACG units are based at:

- RAAF Base Williamtown, near Newcastle, New South Wales;
- RAAF Base Amberley, near Brisbane, Queensland;
- RAAF Base Pearce, near Perth, Western Australia; and
- RAAF Base Tindal, near Katherine, Northern Territory.

Headquarters ACG, located at RAAF Base Williamtown, commands three operational wings:

![Figure 5. Air Combat Group organisation and disposition.](image-url)
• **No 78 Wing** conducts operational training—ground and air—using the Hawk 127 aircraft at Nos 76 and 79 Squadrons. No 278 Squadron provides ground training and simulator training to ACG aircrews and maintenance personnel at Air Force bases across Australia.

• **No 81 Wing** consists of Nos 3, 75, and 77 Squadrons, operating the F/A-18A/B Hornet. The wing also includes No 2 Operational Conversion Unit which provides training for aircrew converting on to the Hornet and conducts other air-combat-related courses.

• **No 82 Wing** consists of No 1 Squadron, operating the F/A-18F Super Hornet multi-role aircraft, and No 6 Squadron which operates the EA-18G Growler electronic attack aircraft. The wing also includes No 4 Squadron, which is responsible for Joint Terminal Attack Controller (JTAC) operations using the Pilatus PC-9/A Forward Air Control (FAC) aircraft and for the JTAC training school.

In late 2018, ACG begins introducing the F-35A Lightning II air combat and strike aircraft into RAAF operational service.
Air Mobility Group

Air Mobility Group (AMG) is responsible for providing the primary ADF air mobility capability. AMG roles include air logistics support (ALS), airborne operations (moving combat forces into and within combat areas), air-to-air refuelling (AAR) and aeromedical evacuation (AME) missions. With over 1420 personnel, AMG operates all of the Air Force C-17A Globemaster III, KC-30A Multi-Role Tanker Transport (MRTT), C-130J Hercules, C-27J Spartan, B737 Boeing Business Jet (BBJ), and CL-604 Challenger aircraft. AMG also operates a squadron of KA350 Super King Air aircraft.

As shown in Figure 6, AMG units are based at:

- RAAF Base Richmond, near Sydney, New South Wales;
- RAAF Base Amberley, near Brisbane, Queensland;
- Defence Establishment Fairbairn, in Canberra, Australian Capital Territory.

Headquarters AMG, at RAAF Base Richmond, commands two operational wings and several other formations:

- **No 84 Wing** conducts specialist and medium air mobility and training. No 34 Squadron transports VIP and senior ADF leaders in 737 BBJ and CL-604 Challenger aircraft. No 37 Squadron operates the Lockheed C-130J providing a tactical and operational air mobility capability. No 35 Squadron provides the ADF with a battlefield airlift capability.

Figure 6. Air Mobility Group organisation and disposition
with the C-27J Spartan. The wing also includes No 285 Squadron who trains ground and air crews for the C-130J Hercules.

- **No 86 Wing** conducts light and heavy air mobility, and AAR operations. No 36 Squadron operates C-17A Globemaster III heavy-lift transport aircraft. No 38 Squadron operates Beechcraft KA350 Super King Air light transport capability and No 33 Squadron operates the KC-30A MRTT capability. The KC-30A also provides a highly effective, strategic-airlift capability.

- **Air Mobility Training Development Unit (AMTDU)** improves the Air Force’s air mobility capability through the certification of current and new ADF equipment for air transport and aerial delivery. It also develops improved systems for airborne delivery. AMTDU also provides Army air logistics training.

- **Air Mobility Control Centre (AMCC)** is responsible for the effective application of available ADF air mobility resources through the planning, organisation, control and monitoring of air mobility missions. These missions include support and participation in exercises, in operations such as humanitarian assistance and disaster relief and in the provision of air mobility support to ADF.
Surveillance and Response Group

Surveillance and Response Group (SRG) provides Air Force’s core intelligence, surveillance and reconnaissance (ISR) capability, although key intelligence capabilities are delivered through Air Warfare Centre. SRG comprises 2300 personnel. The FEG provides the surveillance, reconnaissance, Air Battle Management (ABM), ATC and Maritime Response Capability for ADF.

SRG operates AP-3C Orion, P-8A Poseidon, and E-7A Wedgetail aircraft. SRG also provides:

- battlespace management using the Vigilare command and control system,
- wide area surveillance using the Jindalee Operational Radar Network (JORN),
- space surveillance C-band radar and telescope, and
- air base air traffic services (ABATS) at Air Force’s fixed bases and forward operating bases, including the provision of ATC services for civilian operations at joint-user military-civilian airfields.

As shown in Figure 7, SRG has assets and detachments located in all mainland Australian states, as well as in Malaysia and other overseas locations. The group’s major formations are based at:

- RAAF Base Darwin
  - HQ 452 Squadron
  - No 114 Mobile Control and Reporting Unit
  - No 452 Squadron Darwin Flight
- RAAF Base Tindal
  - No 452 Squadron Tindal Flight
- RAAF Base Townsville
  - No 452 Squadron Townsville Flight
- RAAF Base Richmond
  - No 453 Squadron Richmond Flight
- RAAF Base Pearce
  - No 453 Squadron Pearce Flight
- RAAF Base East Sale
  - No 453 Squadron East Sale Flight
- RAAF Base Edinburgh
  - HQ No 92 Wing
  - No 10 Squadron
  - No 11 Squadron
  - No 292 Squadron
  - No 1 Remote Sensor Unit
  - No 453 Squadron Edinburgh Flight
- Nowra
  - No 453 Squadron Nowra Flight
- RAAF Base Williamtown
  - HQ Surveillance and Response Group
  - HQ No 41 Wing
  - HQ No 42 Wing
  - HQ No 44 Wing
  - No 3 Control and Reporting Unit
  - Surveillance and Control Training Unit
  - No 2 Squadron
  - HQ 453 Squadron
  - No 453 Squadron Williamtown Flight
- RAAF Base Amberley
  - No 5 Flight
  - No 452 Squadron Amberley Flight
- Oakey
  - No 452 Squadron Oakey Flight
- RAAF Base Richmond
  - No 453 Squadron Richmond Flight
- RAAF Base Edinburgh
  - HQ No 92 Wing
  - No 10 Squadron
  - No 11 Squadron
  - No 292 Squadron
  - No 1 Remote Sensor Unit
  - No 453 Squadron Edinburgh Flight

Figure 7. Surveillance and Response Group organisation and disposition.
• RAAF Base Williamtown near Newcastle, New South Wales;
• RAAF Base Edinburgh near Adelaide, South Australia; and
• RAAF Base Darwin in Darwin, Northern Territory.

Headquarters SRG, located at RAAF Base Williamtown, commands the following four wings.

**No 41 Wing** is primarily responsible for providing continuous wide-area surveillance, airspace control and execution of air and space battle management activities, utilising the Vigilare command and control system. The wing includes all of Air Force’s Air Defence Ground-Environment (ADGE) operational and training units, including the following.

- **No 1 Remote Sensor Unit (1RSU)** operates JORN, which comprises three Over-The-Horizon Radars (OTHRs) and the JORN Coordination Centre at RAAF Base Edinburgh to form part of a layered surveillance network providing coverage of Australia’s northern approaches. 1RSU will also operate the Space Surveillance Telescope (SST) and space surveillance C-band Space Surveillance Radar.
- **No 3 Control and Reporting Unit (3CRU)** conducts fixed and deployed air surveillance and battlespace management in support of national homeland defence.
- **No 114 Mobile Control and Reporting Unit (114MCRU)** provides deployed tactical ABM and Air Traffic Management (ATM) in support of directed joint and combined operations.
- **Surveillance and Control Training Unit (SACTU)** provides training for Air Combat Officer (ACO), air battle managers and Air Surveillance Operators (ASOPs) to enable them to perform effective ABM and surveillance operations.

**No 42 Wing** comprises No 2 Squadron which operates the E-7A Wedgetail Airborne Early Warning and Control (AEW&C) capability. The E-7A Wedgetail has a multi-role, electronically-scanned-array radar and a comprehensive communications and tactical data link suite. Wedgetail is a command, control, communications, intelligence, surveillance and reconnaissance (C3ISR) capability that correlates information from a wide variety of sources for distribution among friendly air, land and surface units.

**No 44 Wing** comprises Nos 452 and 453 Squadrons which manage all military ATC flights across Australia and the ATC technical ground electronic services workforce. No 44 Wing provides:

- military airspace management and ABATS for civil domestic and international aircraft, ADF and foreign military aircraft through the delivery of aerodrome and radar control services,
- tactical ATC of forward airfields,
- battlespace management in support of all ADF elements, and
- amphibious airspace control in support of Navy operations and other airspace activity, both within Australia and for operational deployments.

**No 92 Wing** operates the AP-3C Orion Maritime Patrol Aircraft and recently acquired its replacement, the P-8A Poseidon. These aircraft and crews perform a multitude of roles including undersea (Anti-Submarine Warfare) and surface (Anti-Ship) warfare, maritime surveillance, Overland ISR, Naval Fleet Support, and search and survivor supply missions. No 92 Wing comprises the following units:
• No 10 Squadron operates the AP-3C Orion on maritime patrol, anti-submarine warfare (ASW), anti-surface warfare (ASuW) and ISR operations. In late 2018, after 50 years of operational service in Australia, Air Force will transition to replace the AP-3C Orion with the new P-8A Poseidon and MQ-4C Triton UAS.
• No 11 Squadron is introducing the P-8A Poseidon aircraft into service. When initial operating capability is achieved, the squadron will conduct maritime patrol, ASW, ASuW and ISR operations.
• No 292 Squadron conducts simulation and training for Orion and Poseidon air and ground crews.
Air Force Training Group

Air Force Training Group (AFTG) has primary responsibility to train Air Force personnel and selected personnel from Navy, Army and overseas defence forces. This includes the provision of common recruit and officer training, initial employment training, initial and advanced Officer Aviation training. AFTG is also responsible for delivery of selected postgraduate training and Air Force’s Professional Military Education and Training (PMET) continuum.

Located at RAAF Williams, Headquarters Air Force Training Group (AFTG) commands three major elements:

- **Air Academy** is responsible for conducting basic and instructor training for pilots, mission aircrew, mission controllers, in addition to combat survival training for Air Force and selected ADF personnel;
- **Ground Academy** is responsible for overseeing ab initio entry-level, post-initial employment training (PIET) and specialist training courses. The Ground Academy is also responsible for all career development, promotion and leadership training within Air Force professional and education programs.

Figure 8. Air Force Training Group organisation and disposition.
AFTG units are located at: RAAF Williams, located on the outskirts of Melbourne, Victoria; RAAF Base East Sale (near Sale), Victoria; RAAF Base Pearce, near Perth, Western Australia; and RAAF Base Wagga, New South Wales. AFTG employs approximately 1100 personnel across these locations. Additionally, AFTG contributes a substantial effort to Air Force public relations program through the:

- Air Force Roulettes aerobatic display team;
- Air Force Balloon;
- Air Force Band;
- RAAF Museum Point Cook; and
- RAAF Aviation Heritage Centres located at RAAF Bases Amberley, Townsville, Wagga, and Fighter World at Williamtown.

Other Air Force Training. In addition to the training provided by AFTG, Air Force personnel also train alongside members of the Army and Navy at joint training establishments such as the Australian Defence Force Academy, the Australian Command and Staff College and the Defence Strategic Studies Course. Joint training is the responsibility of the Australian Defence College, and Air Force provides both students and staff to these joint training establishments. Additionally, selected members of Air Force attend overseas courses with international partners and allies.

Air Academy currently comprises the following units:

- Air Mission Training School (AMTS), established at RAAF Base East Sale, provides aviation training for Air Force Officer Aviation candidates and Navy Aviation Warfare Officers utilising a fleet of eight King Air aircraft operated by No 32 Squadron. The aircraft are fitted with console-based training and simulation equipment and supported by a suite of ground-based simulators.
- No 1 Flying Training School (1FTS) conducts initial pilot training at East Sale, Victoria, using flying instructors, ab initio flying training, and PC-21 aircraft.
- No 2 Flying Training School, at RAAF Base Pearce, Western Australia, conducts advanced pilot training using Pilatus PC-21 aircraft.
- No 32 Squadron at RAAF Base East Sale, operates King Air 350 aircraft that support the training conducted by 1FTS.
- Central Flying School (CFS) at RAAF Base East Sale operates the PC-21 for pilot instructor training.
- Combat Survival Training School conducts survival training for aircrew at RAAF Base Townsville, Queensland.
- RAAF Museum at Point Cook displays a unique insight into the history of Australian military aviation from the Box-kite aircraft (pre-World War I) to the Boomerang and Catalina (World War II), Iroquois helicopter (Vietnam), and more recent examples with the F-111C and C-130H Hercules. The RAAF Museum displays aircraft from all eras of Australia’s military aviation history and also undertakes aircraft restorations and special aviation exhibitions.
- School of Air Traffic Control trains Air Traffic Control (ATC) students at RAAF Base East Sale, Victoria.

Ground Academy oversees training for employment groups including security, fire, Ground Defence, administration, logistics, technical trades, and explosive ordnance. The wing acts as the Training Development and Quality Assurance Authority for courses conducted at:
• Defence Explosive Ordnance Training School at Defence Orchard Hills,
• RAAF Security and Fire School at RAAF Base Amberley,
• RAAF School of Administration and Logistics Training at RAAF Base Wagga, and
• RAAF School of Technical Training at RAAF Base Wagga.
• Officers’ Training School at RAAF Base East Sale;
• No 1 Recruit Training Unit at RAAF Base Wagga;
• the School of Postgraduate Studies RAAF Base Wagga;
• Air Force Band, which supports ceremonies and parades, both in Australia and overseas; and

Air Force Roulettes. Pilots selected for the Roulettes are drawn from the Qualified Flying Instructor staff posted to CFS, located at RAAF Base East Sale, Victoria. The Roulettes demonstrate technically demanding, spectacular aerobatics displays to the public. When the Roulettes are not performing these displays, the Roulette pilots resume their normal RAAF duties as Qualified Flying Instructors to train RAAF qualified pilots to become flying instructors on each of their respective certified aircraft types.

Air Force Balloon. The Canberra-based hot-air balloon is flown by pilots who are posted to “D Flight” at CFS. The balloon team often travels to regional or remote communities that do not have an airport. These visits provide public relations opportunities for members of the community to meet Air Force personnel, introduce young people to aviation, and inspire an interest in Australian air power and the Air Force. Because the balloon can launch from small open spaces, such as within the confines of a school oval, the balloon team regularly visits schools around Australia where these members will also deliver aviation related education programs.
Combat Support Group

Combat Support Group (CSG) provides air base operation support services to all Air Force formations and, when applicable, ADF and coalition aviation formations. CSG has a breadth of personnel and systems to conduct, support and enable Air Force roles including command and control, force protection, and force generation and sustainment.

With over 5400 personnel, CSG is the largest Air Force FEG and maintains the capacity to concurrently:

- establish and maintain an expeditionary major air base in a low-threat environment in the immediate region,
- establish an expeditionary small air base within the immediate region in a high-threat level, and
- open and operate an airfield in a forward location to enable air power operations.

CSG is responsible for providing command and cadre staff for Air Force permanent bases and the three RAAF prepared bare bases, situated across Australia. Air Force operational units are not permanently based at the bare bases; small caretaker teams are deployed, as needed. There are three bare bases:

- RAAF Base Learmonth, including Learmonth Air Weapons Range, located near Exmouth, Western Australia;
- RAAF Base Curtin, near Derby, Western Australia; and
- RAAF Base Townsville, near Townsville, Queensland.

Figure 9. Combat Support Group organisation and disposition.
CSG provides the support elements required to generate and conduct Air Force missions where and when needed. To meet this role, CSG has a range of equipment including tactical communication systems, Bushmaster Protected Mobility Vehicles (PMV), light-weight and light-capability G-wagons, and military working dogs, and Panther fire trucks.

By design, CSG is able to draw the capability for any combination of air base support functions from a fixed base and tailor an expeditionary package designed to meet the combat support needs of a specific mission and/or aircraft. By maintaining a cadre of well-trained and prepared personnel, CSG provides air base support wherever needed with the smallest possible force. This ability to minimise its deployed force ensures that CSG provides rapid, responsive delivery of agile and effective expeditionary air base support to air operations wherever Air Force is directed by Government.

As shown in Figure 9, CSG has personnel located on every RAAF Base across Australia, as well as in Malaysia and other overseas locations. The FEG’s major formations are based at:

- **RAAF Base Amberley**, near Brisbane, Queensland;
- **RAAF Base Williamtown**, near Newcastle, New South Wales;
- **RAAF Base Richmond**, near Sydney, New South Wales;
- **RAAF Base Townsville**, in Townsville, Queensland; and
- **RAAF Base Edinburgh**, near Adelaide, South Australia.

**Headquarters CSG.** Located at RAAF Base Amberley, commands the Combat Support Control Centre (CSCC) and three major wings, as summarised at Table 3:

**No 95 Wing** provides expeditionary combat air base support capability. The Wing prepares and provides interoperable expeditionary combat air base support capability to air operations and other directed activities in a joint and interagency environment. The wing comprises the following units:

- **Security Forces Squadrons.** Nos 1, 2 and 3 Security Forces Squadrons provide force protection, security and fixed and expeditionary air base defence for the conduct of Air Force and ADF operations. With headquarters at RAAF Bases Williamtown, Amberley and Edinburgh respectively, these squadrons also have detachments supporting other air bases.

- **Contingency Response Squadrons.** Nos 381, 382 and 383 Squadrons are capable of deploying at very short notice to provide effective air base operations in austere conditions at a forward location in a low-threat environment and/or provide the initial element to establish a major air base within the region to ensure a smooth transition to ongoing operations.

- **Communications and Information Systems Support.** No 1 Combat Communications Squadron provides tactical and temporary communications and information systems support to operations, exercises and other activities in support of Air Force and ADF.

- **Expeditionary Air Base Recovery.** No 65 Squadron was formed on 1 July 2015 to deliver explosive ordnance demolition and airfield engineering capabilities. These capabilities assist in assessment of potential air bases, preventing damage to air bases, repairing damage that may occur during operations, and restoring flying and base operations.
• **Operational Conversion Training.** No 295 Squadron is the primary provider for individual operational conversion, collective training, standardisation and preparedness for personnel of CSG units.

**No 96 Wing** provides air base support at Air Force permanent bases, bare bases and support to expeditionary air base capability. The Wing is responsible for the delivery of fixed air base combat support to enable air operations for ADF, allied and regional forces operating from Air Force permanent air bases, and bare bases. The wing also provides support to expeditionary combat air base capability to enable deployed air operations. Other service providers, such as the Defence Support and Reform Group, assist No 96 Wing to provide the air base support necessary to enable the generation and delivery of air power from Air Force’s operational air bases. No 96 Wing comprises:

- No 13, 17, 20, 21, 22, 23, 24, 25, 26, 27, 29, 30 and 31 Squadrons supporting Air Force activities and air bases across Australia; and
- No 19 Squadron is based at RMAF Base Butterworth, Malaysia, to support ADF operations and exercises deployed and conducted in South-East Asia.

**Health Services Wing** provides deployable operational health support. The Wing delivers operational health support wherever and whenever needed, and provides deployable health facilities as part of flexible air base support operations. This includes the provision of expeditionary and fixed base health support to Air Force and wider ADF operations. Health Services Wing comprises the following units:

- Nos 1 and 2 Expeditionary Health Squadrons, providing deployable health support to air operations. These squadrons have headquarters at RAAF Bases Amberley and Williamtown respectively, with detachments providing health support at other operational air bases.

- No 3 Aeromedical Evacuation Squadron is based at RAAF Base Richmond and provides an ADF domestic and expeditionary aeromedical evacuation capability.

- Health Operational Conversion Unit provides military health education and training for Defence health personnel.

**Combat Support Control Centre (CSCC).** CSCC is the operations, planning and control centre for all CSG expeditionary missions. It provides operational level immediate combat support planning capability to both Director General Air Command Operations at HQAC and Director General Air at HQJOC. It also executes operational command of combat support elements assigned to HQJOC. Acting as CSG’s operations centre, the CSCC also liaises closely with the FEG’s three wings to deliver effective air base support whilst continuing the raise, train and sustain activities required to maintain CSG’s preparedness for operations.
Air Warfare Centre

The Air Warfare Centre (AWC) is critical to establishing the RAAF as a modern and fully integrated combat force that can deliver air and space power effects in the information age. The AWC is supported by an integrated workforce which includes Air Force, Army, Navy, Public Service and defence industry personnel, distributed as shown in Figure 10.

The goals of the AWC are to provide:

- a focal point for bottom-up innovation at the tactical and operational levels;
- coordinated and integrated tactics and procedures development across all Air Force platforms using live, virtual and/or constructed (LVC) environments;
- coordination of science and technology (S&T) and research and development (R&D) effort across Air Force;
- testing of current and proposed concepts of operation (CONOPS) against force structure and higher-level Defence plans at the operational and tactical level;
- collation of lessons learned through experimentation for inclusion in strategic planning, capability development, doctrine development and exercise planning; and
- exchange of ideas across the ADF and allied services.

The AWC is made up of the following directorates:

- HQ Air Warfare Centre
- Test and Evaluation Directorate
- Aircraft Research and Development Unit
- Air Warfare Engineering Squadron
- Institute of Aviation Medicine
- Information Warfare Directorate
- Joint Electronic Warfare Operational Support Unit
- No 87 Squadron
- No 462 Squadron
- Air Intelligence Training Unit
- Air Force Ranges Directorate
- Tactics and Training Directorate

Figure 10. Air Warfare Centre organisation and disposition.
Headquarters AWC is responsible for the coordination and implementation of common and integrated functions across AWC in order to meet the AWC mission.

**Test and Evaluation Directorate (TED)** is the ADF service provider to Air Force and Army for specialised flight test and evaluation, aviation medicine support, aeronautical information products, stores clearance and aviation systems engineering support. It consists of the following units:

- **Aeronautical Information Service–Air Force (AIS-AF)** provides ADF and Airservices Australia with tailored, accurate and current aeronautical information in both printed and electronic formats to support air operations.
- **Aircraft Research and Development Unit (ARDU)** provides flight test expertise for ADF. This unit plans, conducts and analyses test and evaluation activities of existing and new Air Force and Army aircraft to enhance the capabilities of fixed- and rotary-wing aviation aerospace weapons systems.
- **Air Warfare Engineering Squadron (AWE SQN)** designs and develops non-standard modifications, special test equipment and facilities, and telemetry functions to support ground and flight tests.

**RAAF Institute of Aviation Medicine (IAM)** ensures the effectiveness and safety of ADF air operations by conducting research and training ADF aircrew to understand and manage the physiological challenges of flight.

**Information Warfare Directorate (IWD)** centralises Air Force’s tactical information warfare elements and provides the wider RAAF with an integrated and tailorable operational support capability drawn from across the intelligence, electronic warfare and information operations domains. It consists of the following units:

- **Joint Electronic Warfare Operational Support Unit (JEWOSU)** provides electronic warfare support to Navy, Army and Air Force. The unit also provides subject matter advice to the Capability Acquisition and Sustainment Group and the Australian Intelligence Community.
- **No 87 Squadron (87SQN)** Collectively, the Squadron enables airpower and is responsible to Air Force for the provision of intelligence for Decision Superiority and the delivery of Precision Effects.
- **No 462 Squadron (462SQN)** seeks to exploit, and protect against exploitation, the information domain and supports operational commanders in providing a secure information environment to support air operations.
- **No 460 Squadron (460SQN)** is Air Force’s targeting squadron. In collaboration with Australian Geospatial-Intelligence Organisation (AGO), it provides accurate and timely targeting products and associated personnel in support of military operations.
- **Air Intelligence Training Unit (AITU)** develops and delivers all source air intelligence training to prepare air intelligence analysts and officers to meet the needs of Air Force’s intelligence capability.

IWD is also responsible for projects aimed at delivering a centralised ISR processing, exploitation and dissemination (PED) capability projects, such as:

- **Joint Airborne ISR Exploitation Environment (JAISREE)** trial.
- **Distributed Ground System – Australia (DGS-AUS)** – the Air Force centralized ISR Processing, Exploitation and Dissemination (PED) system. DGS-AUS is data and sensor agnostic and, through
the exploitation of imagery and signals intelligence, provides ADF and allied forces with timely, accurate, relevant and actionable intelligence.

• **AF Ranges Directorate (AFRD)** is the primary provider of Air Force air weapon ranges and LVC simulation to enable the testing of war materiel and the training of Air Force personnel to deliver more effective warfighters. AFRD consists of the Woomera Test Range (WTR) and Air Weapon Ranges (AWR) functions to support frontline fifth-generation Air Force capabilities. These functions include range management, support to Test and evaluation, support of basic to advanced Air Warfare Training, and management of LVC capabilities and simulation.

**Tactics and Training Directorate (TTD)** focuses on the development of multi-discipline high-end integrated tactics and training across Air Force through a combination of training, education, engagement and integrated exercises. TTD consists of a headquarters element and No 88 Squadron whose aim is to design and facilitate integrated tactics between Air Force FEGs, jointly with Navy and Army, and with our coalition partners. Future developments of this directorate include raising the Air Warfare School (AWS) to conduct training for AWC staff, including the Air Warfare Instructors Course (AWIC).
Air Force People

An important factor in the generation of air power is Air Force’s people. It takes more than just aircrew to generate air power and Air Force is comprised of a multitude of people in various trades which Air Force organises into employment groups for airmen musternings and officer specialisations. The logistics officer and the aircraft technician are just as important to the successful application of air power as the fighter pilot. In addition to skilled personnel in uniform, Air Force requires appropriately skilled public service, contractor and industry personnel employed where necessary to complement the uniformed workforce.

Over the next decade the number of people leaving employment will be much more than the number of people joining the workforce.
Additionally, the Australian workforce is facing a skills shortage that is creating strong competition for people for the workforce. The ADF Total Workforce Model (TWM) has been developed to meet this challenge; to attract and retain the people we need.

### Air Force Job Families

The Air Force job family structure has been principally instituted for the purpose of employing a ‘job family’ approach to allow employment groups who have similar roles/work to be grouped together for analysis purposes. The Air Force job families and each family’s list of airmen musternings and officer specialisations are listed below.

#### Air & Operations
- Air Surface Integration Officer/Combat Control Officer (ASIO/CCO)
- Combat Controller (CC)
- Crew Attendant (CREWATT)
- Flight Engineer (FLTENG)
- Loadmaster (*including Air Refuelling Operator*) (LOADM) (incl ARO)
- Operations Officer (OPSO)

#### Air Technical
- Aeronautical Life Support Fitter (ALSFIT)
- Armament Technician (ARMTECH)
- Aircraft Structural Technician (ASTTECH)
- Aviation Support Technician (*Gap Year only*) (AVSUPTECH)
- Aircraft Surface Finisher (ASURFIN)
- Aircraft Systems Technician (ASYSTECH)
- Aircraft Technician (ATECH)
- Avionics Technician (AVTECH)
- Non-Destructive Inspection Technician (NDITECH)
- Systems Technician (SYSTECH)

#### Cyber
- Cyber Specialists (tba)

<table>
<thead>
<tr>
<th>Engineering</th>
<th>Force Protection and Discipline</th>
<th>Ground Technical</th>
<th>Health</th>
<th>Infrastructure Technical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace Engineer Officer-Aeronautical (AERO)</td>
<td>Air Base Protection (ABP)</td>
<td>Communications Electronic Systems Technician (CESYTECH)</td>
<td>Dental Assistant (DENTASST)</td>
<td>Airfield Engineering Common (AFENG)</td>
</tr>
<tr>
<td>Aerospace Engineer Officer-Armament (ARM)</td>
<td>Airfield Defence Guard (ADG)</td>
<td>Ground Mechanical Engineering Technician (GMETECH)</td>
<td>Dental Officer (DENT)</td>
<td>Carpenter (CARPENTER)</td>
</tr>
<tr>
<td>Aerospace Engineer Officer-Electronics (ELECTR)</td>
<td>Air Force Police (AFPOL)</td>
<td>Grounds Support Equipment (GSE)</td>
<td>Environmental Health Officer (ENVH)</td>
<td>Electrician (ELECN)</td>
</tr>
<tr>
<td>Airfield Engineer (AFENG)</td>
<td>Air Force Security (AFSEC)</td>
<td>Systems Technician (SYSTECH)</td>
<td>Laboratory Officer (LAB)</td>
<td>Plant operator (PLANTOP)</td>
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<tr>
<td>Fire Fighter (FIREFR)</td>
<td>Air Force Police (AFPOL)</td>
<td>Security Forces Airmen (SECFOR)</td>
<td>Pharmacist (PHARM)</td>
<td>Plumber (PLUMBER)</td>
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<tr>
<td>Ground Defence Officer (GRDEF)</td>
<td>Security Policy (SECPOL)</td>
<td>Security Policy (SECPOL)</td>
<td>Radiographer (RADIOG)</td>
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</tr>
<tr>
<td>Ground Force Protection (GRPOL)</td>
<td></td>
<td>Senior Dental Assistant - Preventative (SDAP)</td>
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</tr>
</tbody>
</table>

57
- Works supervisor (WKSSPVR)

**Intelligence and Information Systems**
- Air Intelligence Analyst (AIA):
  - Geospatial Intelligence (GEOINT)
  - Operational Intelligence (OPINT)
  - Signals Intelligence (SIGINT)
- Air Surveillance Operator (ASOP)
- Communications Information Systems Controller (CISCON)
- Air Intelligence Officer (AIO)

**Logistics**
- Logistics Officer (LOG)
- Cook (COOK)
- Movements (MOV)
- Motor transport driver (RAAF Active Reserve only) (MTD)
- Supply (SUP)

**Officer Aviation**
- Pilot:
  - Fast Jet Pilot (FJP)
  - Fixed Wing Pilot (FWP)
  - Remote Pilot (REP)
- Mission Aircrew:
  - Weapon Systems (WSO)
  - Maritime Patrol and Response (MPRO)
  - Air Mobility (legacy) (AMO)
  - Airborne Electronics (legacy) (AEO)
- Mission Controllers:
  - Air Battle Management (ABM)
  - Air Traffic Control (ATC)

**Support Operations**
- Air Force Imagery Specialist (AFIS)
- Chaplain (CHAP)
- Executive Warrant Officer (EXECWOFF)
- Legal Officer (LEGAL)
- Musician (MUSICIAN)
- Personnel Capability Officer (PCO)
- Personnel Capability Specialist (PCS)
- Personnel Psychologist (PSYCH)
- Physical Training Instructor (PTI)
- Training Systems Officer (TSO)
Air Force Reserves

The Air Force Reserves operate across the continuum of Air Force functions and missions performing day-to-day support and mobilisation roles in peacetime, warlike, contingency, domestic and humanitarian emergencies. The Reserve’s primary focus has shifted from a purely strategic role to a day-to-day support role whilst retaining its requirement to provide a workforce surge capability in the event of a major contingency. Since 2006, Reserve members have been fully integrated within Air Force, tri-Service units and non-Service organisations across Australia.

The Reserves are a component of the integrated workforce that enhances the capacity for commanders to sustain operations and meet surge requirements. The Air Force intent is integrating Reserves into the workforce so there is no distinction between the Reservist and Permanent Air Force member. Ideally, this combined contribution, in an integrated workforce, will deliver a richer and enhanced capability to the Air Force team outcome, noting that many Reservists have a diverse range of skills, academic qualifications and experience not usually held by someone at their Service rank.

Reserve personnel are a direct enabler to Air Force capability by providing niche support on a part-time basis in roles that do not require a full-time person allocated to a task. The employment of Reservists in this manner provides greater flexibility to the Air Force and at the same time meets the unique individual requirements of many Reserve personnel.
Australian Air Force Cadets

The Australian Air Force Cadets (AAFC) is a community based, youth oriented organisation with a military and aviation focus that is administered and actively supported by Air Force. The AAFC was originally established in 1941 as the Air Training Corps and was a part of the Empire Training Scheme. Its original aim was to provide pre-entry training for air and ground crews for the RAAF during the Second World War.

The AAFC evolved from the ATC as an effective and popular youth development organisation for girls and boys between the ages of 13 and 18 years of age who are Australian citizens and who are physically able to participate in some of the many and varied activities on offer. The Cadets, and volunteer Officers and Instructors of Cadets, or organised into separate Wings established in each state and territory.

Cadets attend weekly parades, and school holiday encampments. Cadets follow a set training syllabus with activities such as flying, fieldcraft, adventure training, firearms safety training, drill and ceremonial, service knowledge, aeromodelling, navigation, and gliding. The training imparts new knowledge and the cadets acquire valuable life skills and develop qualities such as leadership, self-reliance, self-discipline, self-respect, good communication, teamwork and citizenship. AAFC also provides opportunities for Cadets to apply for the International Air Cadet Exchange Program (IACE) and the Duke of Edinburgh Awards scheme.

Australian Defence Force Ranks and Insignia

The Air Force rank and insignia system forms a part of the backbone of the Australian Defence Force and indicates a member’s role and degree of responsibility. Historically, the Air Force ranks are based on those used by the Royal Air Force, going back to the Second World War, although there are some differences in the insignia, as shown on the following page.
AUSTRALIAN DEFENCE FORCE
BADGES OF RANK AND SPECIAL INSIGNIA

NAVY
- Admiral
- Vice Admiral
- Commodore
- Captain
- Commander
- Lieutenant Commander
- Lieutenant
- Sub Lieutenant
- Acting Sub Lieutenant
- Midshipman

ARMY
- General
- Lieutenant General
- Major General
- Brigadier
- Colonel
- Lieutenant Colonel
- Major
- Captain
- Lieutenant
- 2nd Lieutenant

AIR FORCE
- Air Chief Marshal
- Air Marshal
- Air Vice Marshal
- Commodore
- Group Captain
- Wing Commander
- Squadron Leader
- Flight Lieutenant
- Flying Officer
- Pilot Officer
- Officer Cadet

NAVY
- Warrant Officer of the Navy
- Warrant Officer
- Chief Petty Officer
- Petty Officer
- Leading Seaman

ARMY
- Regimental Sergeant Major
- Warrant Officer of the Army
- Warrant Officer Class 1
- Warrant Officer Class 2
- Staff Sergeant
- Corporal or Lance Corporal
- Lance Corporal

AIR FORCE
- Warrant Officer of the Air Force
- Flight Sergeant
- Sergeant
- Corporal
INTRODUCTION

Part 2 describes a selection of the air combat systems that generate the capabilities that Air Force operates today, along with those that Air Force will operate in the near future.

Having the required skilled people and ensuring all requirements of the fundamental inputs of capability (FIC) are met are essential to the generation, employment, and sustainment of air power. Actual air power effects are provided, however, by the technological systems that Air Force employs in order to provide response options for the Australian Government across the full range of operations. A full range of operations covers humanitarian assistance/disaster relief efforts and other missions along the spectrum of conflict up to, and including, high-end conventional warfighting.
## SUMMARY OF AIR FORCE CAPABILITIES

The tabulated list below shows a summary of Air Force capabilities and roles, aggregated into Force Element Groups, which are described in more detail later in this guide.

### Air Combat Group
- **EA-18G Growler**
  - airborne electronic attack
- **F-35A Lightning II**
  - multi-role fighter
- **F/A-18A/B Hornet**
  - multi-role fighter
- **F/A-18F Super Hornet**
  - multi-role fighter
- **Hawk 127 Lead-in Fighter**
  - introductory fighter aircraft conversion
- **Pilatus PC-9/A**
  - forward air control
- **Combat Control Team**

### Surveillance and Response Group
- **AP-3C Orion**
  - land and maritime surveillance; anti-submarine and anti-ship warfare; naval fleet support; and search and rescue operation
- **E-7A Wedgetail**
  - air battlespace management
- **MC-55A Gulfstream**
  - electronic warfare
- **MQ-4C Triton Unmanned Aircraft System**
  - maritime patrol and surveillance
- **P-8A Poseidon**
  - maritime patrol and response
- **Defence Air Traffic Control**
- **Jindalee Operational Radar Network**
- **Mobile Control and Reporting Centre**
- **Vigilare**
- **Space Surveillance Radar**
- **Space Surveillance Telescope**

### Air Mobility Group
- **737 Boeing Business Jet**
  - special purpose aircraft fleet
- **C-17A Globemaster III**
  - strategic airlift
- **C-27J Spartan**
  - battlefield airlift
- **C-130J Hercules**
  - tactical airlift
- **CL-604 Challenger**
  - special purpose aircraft fleet
- **KC-30A Multi-Role Tanker Transport**
  - air-to-air refuelling and strategic airlift
- **KA350 King Air**
  - training and passenger transport

### Air Force Training Group
- **PC-9/A**
  - pilot training
- **PC-21**
  - pilot training

### Combat Support Group
- **Bushmaster**
  - protected mobility
- **Lightweight G-Wagon**
  - high-mobility, general-purpose transport
- **Military Working Dog**
  - security, crime prevention patrols, emergency response, and intruder detection
- **Panther Airfield Fire Truck**
  - aircraft rescue firefighting and structural rescue firefighting
- **Titan Truck Fire General Purpose**
  - aircraft rescue and firefighting
- **Woomera Range Complex**
  - test and evaluation of military systems

### Air Warfare Centre
- **Established at RAAF Base Edinburgh**
EA-18G Growler

**Operational Characteristics**
- **Manufacturer:** Boeing
- **Speed:** Mach 1.8 (2 200 km/h)
- **Dimensions:** 18.3 m long, 4.88 m high, 13.62 m wingspan
- **Ceiling:** Above 50,000 ft (15.24 km)
- **Ferry Range:** 3330 km (extended with air-to-air refuelling)
- **Combat Radius:** 1570 km (fully armed with external fuel tanks)
- **Crew:** Two (pilot and mission specialist)
- **Weapons:** AIM-120 AMRAAM radar-guided missiles; AGM-88 anti-radiation missile; AGM-154C JSOW; GPS-guided JDAM; and ALQ-128 wideband receiver, ALQ-99 tactical jamming pods.

**Operational Employment**
The E/A-18G Growler is a dual-seat, Force-Level Electronic Warfare (FLEW) aircraft capable of a wide range of electronic support and electronic attack actions in contested environments, as well as the ability to disrupt or jam a range of military electronics systems, including radars and communication systems. The E/A-18G utilises the F/A-18F airframe, engines, avionics and sensors with additional unique EW sensors and associated equipment.

Growler provides a new dimension to operations, unique to our region, which increases effectiveness and reduces the risk to ADF forces conducting operations across the land, maritime and air domains. The aircraft has nine weapon stations capable of carrying 13,600 kg of fuel, pods, and/or weapons in various configuration options.

Air Force currently has eleven EA-18G Growlers operated by No 6 Squadron, based at RAAF Base Amberley, and employed in conjunction with ADF air, land and sea forces.
F-35A Lightning II

Operational Characteristics

Manufacturer: Lockheed Martin

Speed: Mach 1.8 (2200 km/h)

Airframe: 15.7 m long, 4.40 m high, 10.7 m wingspan

Ceiling: Above 45,000 ft (13.72 km)

Ferry Range: 2220 km (extended with air-to-air refuelling)

Combat Radius: 740 km (with weapons load)

Crew: Pilot

Weapons: AIM-120 AMRAAM radar missiles and AIM-9X Sidewinder missiles; Small Diameter Bomb; AGM-154 JSOW; Mk-80 series GP bombs; GBU-12 laser-guided and GBU-31 GPS-guided bombs; and 25-mm cannon.

Operational Employment

The F-35A Lightning II is the Australian Defence Force’s first fifth-generation air combat capability. The F-35A is a fifth-generation fighter, with advanced survivability, lethality and supportability to ensure Australia maintains a capability edge against current and emerging threats. The F-35A incorporates comprehensive stealth technology, electronic protection, electronic attack and advanced countermeasures to survive in demanding threat environments. It has fused, multi-spectral sensors and advanced networking capabilities for an unprecedented level of situational awareness and when combined with advanced weapons, will deliver increased lethality against heavily defended targets.

The F-35A Lightning II delivers air power effects through control of the air, land and maritime strike and ISR in support of land and maritime forces. Australia has committed to 72 F-35A aircraft for squadrons at RAAF Base Williamtown, and RAAF Base Tindal. In the future, a fourth operational squadron will be considered, for a total of 100 F-35A aircraft.
F/A-18A/B ‘Classic’ Hornet

Operational Characteristics

Manufacturer: Boeing (formerly McDonnell Douglas)

Speed: Mach 1.8 (2 200 km/h)

Dimensions: 17.1 m long, 4.7 m high, 12.4 m wingspan

Ceiling: Above 45,000 ft (13.72 km)

Ferry Range: 2700 km (extended with air-to-air refuelling)

Combat Radius: 740 km

Crew: F/A-18A – pilot; F/A-18B – instructor pilot & student

Weapons: AIM-120 AMRAAM and AIM-132 ASRAAM guided missiles; AGM-84 Harpoon anti-ship missiles; Mk-80 series conventional and Paveway laser-guided bombs; GPS and laser guided JDAM; AGM-158 JASSM; and 20-mm nose-mounted cannon.

Operational Employment

The F/A-18A (single seat) and F/A-18B (twin seat) Hornets are multi-role fighter aircraft that first entered service with Air Force in the mid-1980s. Hornets have the ability to attack air, ground and maritime targets by employing a range of integrated systems, including precision guided weapons using a radar and infrared pod for sensing and targeting. The Hornet is capable of offensive and defensive counter air operations, strategic attack, anti-surface warfare, close air support of ground troops, and air interdiction of enemy supply lines including shipping.

Nos 3 and 77 Squadrons (operational squadrons) and No 2 Operational Conversion Unit (a training squadron) at RAAF Base Williamtown near operate the F/A-18A/B Hornet. The aircraft is also operated by No 75 Squadron (an operational squadron) at RAAF Base Tindal. Air Force has 71 F/A-18A/B Hornets.
## F/A-18F ‘Rhino’ Super Hornet

### Operational Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manufacturer</strong></td>
<td>Boeing (formerly McDonnell Douglas)</td>
</tr>
<tr>
<td><strong>Speed</strong></td>
<td>Mach 1.6 (1960 km/h)</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>18.3 m long, 4.9 m high, 13.6 m wingspan</td>
</tr>
<tr>
<td><strong>Ceiling</strong></td>
<td>Above 50,000 ft (15.24 km)</td>
</tr>
<tr>
<td><strong>Ferry Range</strong></td>
<td>2700 km (extended with air-to-air refuelling)</td>
</tr>
<tr>
<td><strong>Crew</strong></td>
<td>Two (Pilot and Air Combat Officer)</td>
</tr>
<tr>
<td><strong>Weapons</strong></td>
<td>AIM-120 AMRAAM radar-guided missiles, AIM-9X Sidewinder infra-red seeking missile, AGM-84 Harpoon anti-ship missiles, AGM-154C JSOW, conventional and laser-guided bombs, GPS-guided and laser-guided JDAMs, and M61A2 20-mm nose-mounted cannon.</td>
</tr>
</tbody>
</table>

### Operational Employment

Larger than the F/A-18A/B ‘Classic’ Hornet, the F/A-18F ‘Rhino’ Super Hornet is a dual-seat aircraft that delivers an advanced air combat capability for all air-to-air and air-to-surface operations. The Super Hornet can be armed with both conventional and laser-guided weapons and, with its 11 weapon stations, is capable of carrying 14 515 kg of fuel and/or weapons in various configuration options. The F/A-18F enjoys increased combat survivability through reduced radar signature and an integrated defensive electronic-countermeasures suite. Equipped with APG-79 Active Electronically Scanned Array (AESA) radar, enhanced sensors and high-bandwidth network connectivity, the F/A-18F Super Hornet provides ADF with a true 4.5 generation fighter aircraft capability.

Air Force has 24 F/A-18F Super Hornets, operated by No 1 Squadron at RAAF Base Amberley.
Hawk 127 Lead-In Fighter

**Operational Characteristics**

**Manufacturer:** BAE Systems  
**Speed:** 1207 km/h  
**Dimensions:** 11.95 m long, 4.08 m high, 9.39 m wingspan  
**Ceiling:** 50,000 ft (15.24 km)  
**Ferry Range:** 1200 km  
**Crew:** Two (pilot instructor and student)  
**Weapons:** Air Intercept Missile (AIM)-9M infra-red missiles; practice, conventional and laser-guided bombs; and 30-mm cannon.

**Operational Employment**

The Hawk 127 aircraft prepares qualified Air Force aircrew for operational conversion onto the F/A-18A/B Hornet and F/A-18F Super Hornet. While not an operational aircraft, the Hawk 127 can fly night and day missions to train fast-jet aircrew in air-to-air and air-to-surface operations. The aircraft also provides lower-cost, fast-jet, close-air-support training and Navy air-defence training. The Hawk 127 is a training and support aircraft that will be upgraded to ensure it can meet future aircrew training requirements for the F/A-18F Super Hornet and the F-35A Lightning II.

The Hawk 127 is operated by No 76 Squadron at RAAF Base Williamtown and No 79 Squadron at RAAF Base.
Pilatus PC-9/A
Forward Air Control

Operational Characteristics
Manufacturer: Pilatus
Speed: 580 km/h
Dimensions: 10.2 m long, 3.3 m high, 10.2 m wingspan
Ceiling: 25,000 ft (7.62 km)
Ferry Range: 1850 km (with two underwing tanks)
Combat Radius: 650 km
Crew: Pilot & Forward Air Controller

Operational Employment
Based at RAAF Base Williamtown are four modified PC-9/A (Forward Air Control variant) aircraft in grey paintwork, fitted with smoke grenade dispensers for target marking. They are used to train ADF Joint Terminal Attack Controllers (formerly forward air controllers) who coordinate air support to troops on the ground.

No 4 Squadron at RAAF Base Williamtown operates four PC-9/A aircraft for FAC training. The PC-9/A is an exceptionally capable aircraft that has served Air Force for over twenty years. In order to meet the training requirements for more advanced future aircraft, the PC-9/A is planned to be replaced by the PC-21.
Combat Control Team

Operational Characteristics

Combat Effects: Joint Terminal Attack Control
Assault Zone
Reconnaissance
Advanced Force Operations
Weather Observation
Planning and Liaison
Pilot & Forward Air Controller

Operational Employment

The role of the Combat Control Team (CCT) is to integrate, synchronise and control the elements of air and space power at the tactical level that enable the execution of precision attack and military advance force operations. It is an extension of Air Force’s tactical command and control of Air Power to enable survivable, sustainable and credible operations in a non-permissive environment due to either enemy ground action or environmental considerations. Combat Controllers (CC) contribute to capability through the provision of Air Power application within the Joint Operations Command, Air Command and Special Operations Command environments. CCs provide the application of the following effects:

Combat Controllers work either individually with other units or in small, discrete teams with a high degree of autonomy for decision-making founded on maturity and sound judgement when under significant environmental and physical stress.
AP-3C Orion

**Operational Characteristics**

**Manufacturer:** Lockheed Martin  
**Speed:** 750 km/h (max), 650 km/h (cruise)  
**Dimensions:** 35.6 m long, 10.4 m high, 30.8 m wingspan  
**Ceiling:** 35,000 feet (10.67 km)  
**Ferry Range:** 8900 km  
**Endurance:** 15 hours  
**Crew:** Air Force pilots and mission aircrew are assigned depending on the needs of the mission.  
**Weapons:** Mark 46 lightweight torpedoes, AGM-84 Harpoon anti-ship missiles  
**Ordnance:** Acoustic sonobuoys, maritime marker devices, Air-Sea Rescue Kit (ASRK) and survival aid ‘heli-boxes’.

**Operational Employment**

The AP-3C Orion is capable of land and maritime surveillance, anti-submarine and anti-ship warfare, naval fleet support, and search-and-survivor-assistance operations. The AP-3C Orion is operated by No 10 Squadron at RAAF Base Edinburgh.

The P-3C variant was introduced in 1978, and underwent several significant upgrades before it became the current AP-3C Orion, which was introduced into service in 2002. The AP-3C Orion is in the process of a graduated draw down to retirement, with the final aircraft planned for withdrawal in 2021. The AP-3C will be replaced by the P-8A Poseidon and MQ-4C Triton, which will perform the vital functions of long range maritime patrol.
E-7A Wedgetail

**Operational Characteristics**

**Manufacturer:** Boeing  
**Speed:** Maximum 870 km/h, cruise 760 km/h  
**Dimensions:** 33.6 m long, 12.6 m high, 34.3 m wingspan  
**Ceiling:** 41,000 feet (12.5 km)  
**Ferry Range:** 5600 km (extended with air-to-air refuelling.)  
**Endurance:** 10 hours (without air-to-air refuelling)  
**Crew:** Pilots and mission aircrew are assigned depending on the mission needs.  
**Equipment:** MESA radar; EW self-protection including infra-red countermeasures, chaff, and flares; and radio systems, datalink and satellite communications.

**Operational Employment**

Entering service in 2009, Australia’s ‘eyes in the sky’—the E-7A Wedgetail—represents a new capability for ADF. It provides a key surveillance component of the networked defence force, fusing and disseminating information to air, maritime and land forces to enhance their effectiveness and survivability. The Wedgetail detects and identifies vehicles within the battlespace and provides command-and-control direction for airborne assets as well as support and situational awareness of the battlespace to surface- and land-based anti-air warfare elements.

Air Force has six E-7A Wedgetail aircraft, operated by No 2 Squadron at RAAF Base Williamtown.
MC-55A Gulfstream

**Operational Characteristics**

- **Manufacturer:** Gulfstream
- **Speed:** 904 km/h
- **Dimensions:** 29.4 m long, 7.8 m high, 28.5 m wingspan
- **Ceiling:** 51,000 feet (15.5 km)
- **Ferry Range:** 12,501 km
- **Endurance:** 12 hours
- **Crew (on ground):** Air Force pilots and mission aircrew, assigned to meet mission needs.
- **Equipment:** Electronic warfare support suite.

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1 Based on Original Equipment Manufacturer’s specifications for Gulfstream G550.

**Operational Employment**

From the early 2020s, Defence will acquire up to five long-range electronic warfare support aircraft based on the Gulfstream G550 airframe with additional and modified systems. This capability will substantially enhance electronic warfare support to naval, air, and land forces for operations in electromagnetic environments manipulated by hostile forces, with the operating cost, range and endurance benefits of a commercial airframe.

The aircraft will be acquired in two tranches and incrementally upgraded to maintain commonality with the US-developed systems for long-term supportability and to maintain interoperability.
MQ-4C Triton Unmanned Aircraft System

Operational Characteristics
Manufacturer: Northrop Grumman
Speed: 613 km/h
Dimensions: 14.5 m long, 4.6 m high, 39.9 m wingspan
Ceiling: 50,000 feet (15.24 km)
Range/Endurance: 24+ hours
Crew (on ground): Flown by pilots from a ground station, supported by a co-pilot. ISR and data will be analysed by aircrew, intelligence and operations officers, engineers, and logisticians (depending on mission needs).

Equipment: ISR sensor suite that provides a 360-degree view of its surroundings to over 2000 nautical miles.

Operational Employment
Triton is a remotely piloted type of Unmanned Aircraft System (UAS) that Air Force will operate alongside the P-8A Poseidon. Triton, together with P-8 Poseidon, will provide Australia with an advanced maritime patrol and surveillance capability to replace the ageing AP-3C Orion.

It is a high-altitude, long-endurance aircraft capable of all-weather surveillance and reconnaissance tasks over maritime and land environments. Reinforcements to the airframe and wing, along with de-icing and lightning protection systems allow the Triton to descend through cloud layers to gain closer views of ships and other targets at sea. With Australia’s maritime area of operational interest covering over one-seventh of the world’s oceans, the multi-mission Triton will be a critical complement to Poseidon for Australian air power to contribute to maintain a credible national level of maritime awareness.

Up to seven Tritons will be stationed at RAAF Base Edinburgh, with a forward operating base at RAAF Base Tindal.
P-8A Poseidon

Operational Characteristics

**Manufacturer:** Boeing  
**Speed:** 907 km/h  
**Dimensions:** 39.5 m long, 12.8 m high, 37.6 m wingspan  
**Ceiling:** 41,000 feet (12.5 km)  
**Range:** 2200 km combat radius with four hours on station  
**Ferry Range:** 7500 km (extended with air-to-air refuelling)  
**Endurance:** 10 hours (extended with air-to-air refuelling)  
**Crew:** Air Force pilots and mission aircrew (up to ten crew) are assigned to meet the mission needs.  
**Weapons:** Mark 54 torpedoes, AGM-84 Harpoon anti-ship missiles, and self-protection measures.

Operational Employment

With four times the data processing capacity of Air Force’s current AP-3C Orions, the P-8A Poseidon will provide a more advanced and manned Maritime Intelligence Surveillance Reconnaissance & Response (MISRR) capability including anti-surface and anti-submarine warfare, maritime and overland ISR, electronic support, and search and survivor assistance.

The P-8A will also be capable of receiving air-to-air refuelling from the boom of tanker aircraft, such as Australia’s KC-30A once testing is complete, pushing its endurance out to over 20 hours – making it possible to patrol Australia’s isolated Southern Ocean territories.

RAAF Base Edinburgh will be the main operating base for the P-8A Poseidons, operated by No 11 Squadron. The Government has committed to acquiring 15 P-8A Poseidon aircraft. 12 P-8A Maritime Patrol Aircraft have been approved for acquisition, and three are subject to normal Government Defence acquisition approval processes.
Defence Air Traffic Control

Operational Characteristics
ADF Airspace Management (ASM) and military Air Traffic Control (ATC) service are delivered by the RAAF Air Traffic Control (ATC) officer workforce and the Australian Defence Air Traffic System (ADATS) capability. In addition to providing safe, efficient and flexible ASM and Air Base Air Traffic Services (ABATS) for military aircraft at home and deployed locations, the ATC workforce contributes an integral component of the national Air Traffic Management (ATM) architecture by providing ABATS for civilian aircraft operating in military-controlled airspace surrounding Defence ‘controlled’ air bases.

Operational Employment
The objectives of the Defence Air Traffic Control (ATC) organisation are to:
• prevent collisions between aircraft;
• prevent collisions between aircraft and obstructions on air bases;
• expedite and maintain an orderly flow of air traffic;
• provide advice and information useful for the safe and efficient conduct of a flight;
• notify and assist relevant organisations regarding aircraft in need, as required;
• liaise with Airservices Australia and other organisations to ensure the safe and efficient operation of ADF aircraft in Australian airspace; and
• contribute to Air Battle Management (ABM).

The RAAF ATC workforce provides ASM and ABATS for humanitarian aid and disaster relief in Australia and overseas, as well as ASM, ABATS and battlefield airspace control (includes de-conflicting aircraft and battlefield weapons in combat environments such as amphibious and land operations). The deployable ATC capability includes a tactical air surveillance radar, control cabin, and tactical air operations tower.

Under a whole-of-government approach, the military ATC is integrated into the national ATM network to contribute to the national recognised air picture. The military ATC facilities provide a limited back-up for civilian ATC operations. ATC permanent positions exist at RAAF Bases Amberley, Darwin, Edinburgh, East Sale, Pearce, Richmond, Tindal, Townsville, and Williamtown, and RAAF Gin Gin (35 km northwest of RAAF Base Pearce), Naval Air Station Nowra, and Army Aviation Centre Oakey.
Jindalee Operational Radar Network

Operational Capability
Australia’s Jindalee Operations Radar Network (JORN) comprises three Over-The-Horizon-Radar (OTHR) sites located at:

- Longreach, Queensland;
- Laverton, Western Australian; and
- Alice Springs, Northern Territory.

JORN comprises six large remote sites - transmit and receive sites separated by 150km, for each of the three OTHR radars – eleven unmanned sounder sites that span Northern Australia, and the JORN Coordination Centre located in 1RSU at RAAF Base Edinburgh.

Operational Employment
OTHR utilises the refractive properties of the ionosphere to refract or bend transmitted HF electromagnetic waves back to Earth. When these refracted HF waves hit a radar reflective (metal) surface of sufficient size — either airborne or maritime — some of the energy is reflected back along the transmission path to the OTHR receiver. Sophisticated computer systems then process the received energy to discern objects within the radar’s footprint.

JORN provides wide-area surveillance of Australia’s northern approaches at ranges of 1000 to 3000 km from the radar sites and is used to conduct air and maritime surveillance in support of Australia’s national surveillance effort. However, the extent of available JORN coverage and actual system performance is highly variable and principally dependent on the state of the ionosphere (ie the upper layers of the atmosphere).

JORN was designed to detect air targets equivalent in size to the Hawk 127 aircraft or larger, and objects on the surface of the water equivalent in size to a Navy patrol boat or larger. Conversely, the detection of small wooden vessels is highly improbable, given the typical size, construction and speed of such vessels.
Mobile Control and Reporting Centre

Operational Characteristics
Capability: TPS-77 Air Surveillance Radar

Operational Employment
Garrisoned at RAAF Base Darwin, the Mobile Control and Reporting Centre (MCRC) provides a deployable and persistent air surveillance, information management, command-and-control (C2) capability in support of directed joint and combined operations. Deployable for several weeks or longer, it provides options to the Government as an enabler to the networked force, including the planning and execution of coalition and allied air operations.

The existing capability entered service in the 1980s and has been deployed on operations within Australia and overseas. An Air Force mobile control and reporting centre and tactical air defence radar system were deployed to Kandahar Airfield in Afghanistan, to provide control for military aircraft throughout Afghanistan from 5 August 2007 to 7 July 2009. Operating 24 hours-a-day, seven days-a-week for nearly two years, 75 personnel have supported more than 196,000 aircraft movements.
**Vigilare**

**Operational Characteristics**

**Capability:** Vigilare capability represents a highly networked command and control capability for the RAAF, combining surveillance, airspace battle management and provision of the Recognised Air Picture (RAP) to higher Defence headquarters and the joint force.

**Operational Employment**

Vigilare provides the ADF with an integrated command, control and communications system within the RAAF air defence ground environment. This is an enabler for Air Battle Management providing control of military air operations for the joint force in an area of operations and may include the control and coordination of defensive counter air, offensive counter air, strategic attack, close air support and other warfighting or supporting air activities.

Vigilare provides the ADF with a fixed and persistent—24 hours-a-day, seven days-a-week—surveillance and battlespace management capability. It is designed to provide an integrated defence systems communications network and produces a comprehensive picture of air and surface activity over Australia and throughout the near region. Teams of mission controllers, air intelligence staff, and air surveillance operators exchange surveillance information and battle management instructions to military forces operating across Australia.

The RAAF has two regional operations centres located in the Northern Regional Operations Centre (NORTHROC) at RAAF Base Tindal, Northern Territory, and the Easter Region Operations Centre (EASTROC) located at RAAF Base Williamtown, New South Wales.
Space Surveillance Radar

Operational Characteristics
Capability: Space situational awareness

Operational Employment
C-Band Space Surveillance Radar seeks to improve Space Situational Awareness for Defence by utilising a US-owned space surveillance radar and radar control system. The sensor is based at Naval Communications Station Harold E. Holt (HEH) and operates as an additional sensor in the United States (US) global Space Surveillance Network.

The ADF is embarking on two joint initiative projects with the US to introduce a space situational awareness (SSA) capability. This is a recently acquired capability which will grow and provide ADF with an increased awareness of objects and activities in the orbital space environment.

The radar, operated by Australia on behalf of the US, contributes to the US Global Space Surveillance Network, which provides warnings to all satellite operators of potential collisions with other satellites or debris.
Space Surveillance Telescope

**Operational Characteristics**

**Capability:** Wide aperture electro-optical telescope

**Operational Employment**

The ADF is embarking on two joint initiative projects with the US to introduce a space situational awareness (SSA) capability. This is a new capability which will grow and provide ADF with an awareness of activities in space.

The Space Surveillance Telescope involves Australia hosting the deployment of a space surveillance telescope (SST) to improve its ability to monitor space over the southern hemisphere. This highly advanced technology will enable the observation and detection of objects in space out to 36,000 km above the Earth in geostationary orbit. The telescope is established Naval Communications Station Harold E Holt.

The US-owned wide aperture electro-optical telescope, which is operated by Australian crews at 1RSU, located at RAAF Base Edinburgh, on behalf of the US will contribute to the US Global Space Surveillance Network (SSN). The SSN provides warnings to satellite operators of potential collisions with other satellites or debris.

The new Space Surveillance Telescope facilities will contribute to further strengthening Australia’s and the United States of America’s partnership towards a global surveillance capability and the ADF’s space surveillance capability.
737 Boeing Business Jet

Operational Characteristics

| Manufacturer | Boeing |
| Speed        | 850 km/h |
| Dimensions   | 33.6 m long, 12.5 m high, 35.8 m wingspan |
| Ceiling      | 41,000 ft (12.5 km) |
| Range        | 11,390 km |
| Crew         | Two pilots and up to four crew attendants, assigned as needed by the mission. |
| Capacity     | Thirty passengers in VIP configuration. |

Operational Employment

Air Force has a fleet of two Boeing Business Jet (BBJ) aircraft, which were introduced in 2002, are part of the Special Purpose Aircraft fleet operated by No 34 Squadron based at Defence Establishment Fairbairn, in the Australian Capital Territory.

The BBJs provide an agile transport capability that can carry Government and staff within Australia and overseas. The aircraft has seating, a meeting room, working space, and communications facilities. The use of Air Force Special Purpose Aircraft allows Government to attend international forums and conduct state visits easily, thus ensuring Australia is represented on the world’s stage.

Air Force has a fleet of two BBJs. The BBJ complements the smaller CL604 Challengers also operated by No 34 Squadron.
C-17A Globemaster III

Operational Characteristics
Manufacturer: Boeing
Speed: 830 km/h
Dimensions: 53.0 m long, 16.8 m high, 51.8 m wingspan
Ceiling: 45,000 ft (13.7 km)
Range: 10,389 km carrying 18,143 kg payload (extended by air-to-air refuelling)
Crew: Pilot, Co-pilot, and Loadmaster
Capacity: 102 troops; 54 ambulatory and 36 stretcher patients; or 77.5 tonnes of cargo, depending on mission needs.

Operational Employment
Eight C-17A Globemaster III aircraft provide a responsive global heavy airlift capability to allow the rapid deployment of troops, supplies, combat vehicles, heavy equipment and helicopters anywhere in the world.

The C-17A can carry approximately the equivalent of three C-130J Hercules or four semi-trailer loads of humanitarian aid.

Since delivery, the C-17A has flown an air bridge supporting Australian operations in the Middle East; provided rapid humanitarian assistance to New Zealand, Japan and Pakistan and assisted the civil community in Australia. For example, the C-17A Globemaster III was instrumental in providing support to Bundaberg airport, after the Queensland floods in January 2013, including the re-supply of the aviation fuel reserves depleted by the relentless rescue efforts of Army and civilian helicopters. In 2011, two C-17s deployed to Japan to support search and rescue efforts after an 8.9 magnitude earthquake and tsunami.

Air Force has eight C-17A Globemasters, operated by No 36 Squadron based at RAAF Base Amberley.
C-27J Spartan Battlefield Airlifter

Operational Characteristics
Manufacturer: Alenia/L3
Speed: 670 km/h
Dimensions: 22.7 m long, 9.6 m high, 28.7 m wingspan
Ceiling: 30,000 ft (9.1 km)
Range: 1700 km (at maximum take-off weight)
Crew: Pilot, Co-pilot, and Loadmaster
Capacity: 34 passengers/paratroopers; 21 stretcher patients; or 5000 kg of cargo, vehicles, or combinations.

Operational Employment
The C-27J Spartan is a medium-sized military transport aircraft derived from the Alenia G-222. It is significantly improving the ADF’s intra-theatre airlift capability by using a greater range of airfields and threat environments, both in Australia and in our neighbouring regions.

Equipped with a modern avionics suite and sharing common engineering aspects with the C-130J Hercules, the C-27J features protection against ground fire and electronic warfare self-protection systems that enhance battlefield survivability. The size of the cargo compartment allows rapid transfer of loads—from the C-17A and the C-130J aircraft—for delivery to austere airfields, thus enhancing efficiency in ADF air mobility support to the battlefield or natural disaster zone.

Air Force has ten C-27J Spartan aircraft operated by No 35 Squadron, initially located at RAAF Base Richmond. The squadron will relocate to RAAF Base Amberley once permanent facilities are completed in 2019.
**C-130J Hercules**

**Operational Characteristics**
- **Manufacturer:** Lockheed Martin
- **Speed:** 625 km/h
- **Dimensions:** 34.4 m long, 10.1 m high, 40.4 m wingspan
- **Ceiling:** Above 40,000 ft (12.2 km)
- **Range:** 5100 km with 18,155 kg payload
- **Crew:** Pilot, Co-pilot, and Loadmaster
- **Capacity:** 128 troops, 74 paratroops, aeromedical evacuation kit, or 80 stretcher patients plus medical staff.

**Operational Employment**
The C-130J is the latest generation of Hercules to provide tactical and strategic transport of people, supplies, vehicles and equipment. The C-130J provides medium to long-range transport with an excellent short field and semi-prepared airfield capability. Much like previous models, the C-130J has built on a legacy of airlift support to ADF throughout the world, fulfilling roles such as search-and-survivor-assistance, aeromedical evacuation and humanitarian aid to Australian and neighbouring civil communities during natural disasters, and in the aftermath of the 2002 and 2005 Bali bombings.

Australia’s 12 C-130J Hercules aircraft are operated by No 37 Squadron at RAAF Base Richmond.
KC-30A Multi-Role Tanker Transport

Operational Characteristics
Manufacturer: Airbus Military
Speed: 860 km/h
Dimensions: 59.0 m long, 17.4 m high, 60.3 m wingspan
Ceiling: Above 41,000 ft (12.5 km)
Range: 14,800 km (extended by air-to-air refuelling)
Crew: Pilot, Co-pilot, Air Refuelling Operator, Mission Aircrew, and Crew Attendants, assigned as needed by the mission
Capacity: 270 passengers, 34,000 kg of cargo, or various combinations of both.

Operational Employment
The KC-30A Multi-Role Tanker Transport (MRTT) is an Airbus A330 with military modifications designed by Airbus Defence and Space for air-to-air refuelling (AAR) and long-range transport. Major modifications to the aircraft include the installation of two wing pods for hose/drogue refuelling, an aerial refuelling boom system and military avionics, including mission planning computers and communications equipment. Able to remain on station up to 1800 km from base and offload 50 tonnes of fuel over four hours, the KC-30A is a force multiplier for other air power capabilities such as the F/A 18 Hornet, Growler, and Super Hornet. The KC-30A can also carry cargo loaded on military or civilian pallets and up to 270 passengers.

No 33 Squadron operates a fleet of five KC-30A aircraft from RAAF Base Amberley. An additional two A330-200 aircraft were purchased from Qantas and are undergoing modification to KC-30A standard in Spain. In September 2014, one KC-30A aircraft deployed to the Middle East under Operation Okra to provide AAR for RAAF and coalition aircraft. The aircraft has flown at least one mission each day and has offloaded approximately 36 tonnes of fuel on each sortie.

Air Force has six KC-30A aircraft based at RAAF Base Amberley.
CL-604 Challenger

Operational Characteristics
Manufacturer: Bombardier
Speed: 870 km/h
Airframe: 20.9 m long, 6.3 m high, 19.6 m wingspan
Ceiling: 41,000 ft (12.5 km)
Range: 5600 km
Crew: Pilot, Co-pilot, and one crew attendant
Capacity: Nine passengers.

Operational Employment
Introduced into service in 2002, the two 737 Boeing Business Jet (BBJ) and three CL-604 Challenger aircraft support special purpose air transport for the Governor-General of Australia, the Prime Minister, other Government members and visiting heads of state. With their modern interior and an outstanding record for safety and efficiency, the BBJ and Challenger provide an appropriate standard of VIP transport. The 737 BBJ is typically used for long-distance travel or for carrying larger numbers of passengers, but does on occasion perform air logistic support. The CL-604 Challenger is typically used for shorter tasks to smaller airfields and does on occasion perform air logistic support.

The CL-604 Challenger is operated by No 34 Squadron at Defence Establishment Fairbairn. On 24-hour standby and providing between 1200 and 1800 special purpose flights per year, No 34 Squadron maintains a high operational tempo, including planned international operations into large airports and domestic tasks into small country airports at short notice.

Air Force has a fleet of three CL604 Challenger aircraft. Approaching the expiration date of the current aircraft leases, Air Force is investigating options to replace the BBJ and Challenger aircraft with more modern, efficient and capable aircraft with the flexibility to better meet Government obligations.
Operational Characteristics

- Manufacturer: Pilatus
- Speed: 580 km/h
- Dimensions: 10.18 m long, 3.28 m high, 10.24 m wingspan
- Ceiling: 25,000 ft (7.62 km)
- Range: 1500 km
- Combat Radius: 650 km
- Crew: Student & instructor pilots for a training sortie

Operational Employment

Advanced training of Air Force and Navy pilots in the PC-9A commenced in 1989 and is conducted at No 2 Flying Training School at RAAF Base Pearce. Designed by Pilatus in Switzerland and built under license by Hawker de Havilland in Sydney, the PC-9/A is also operated by the Central Flying School at RAAF Base East Sale for the training of flying instructors. The aircraft is flown by the RAAF’s Roulettes aerobatic team.
Pilatus PC-21 Pilot Trainer

Operational Characteristics

Manufacturer: Pilatus  
Speed: 685 km/h  
Dimensions: 11.2 m long, 3.8 m high, 9.1 m wingspan  
Ceiling: 25,000 ft (7.62 km)  
Range: 1333 km  
Crew: Student & instructor pilots

Operational Employment

As part of the new Pilot Training System, the PC-21 will replace Air Force’s current PC-9/A. It will be based at RAAF Base East Sale in Victoria and RAAF Base Pearce in Western Australia.

The PC-21 is a key element of the new Pilot Training System, which will be able to train more people faster and to a higher standard. The total system comprises advanced aircraft, flight simulators, and an electronic learning environment.

Australia is acquiring 42 PC-21 aircraft. The PC-21s will be based at RAAF Base East Sale in Victoria and RAAF Base Pearce in Western Australia.
KA350 King Air

**Operational Characteristics**

- **Manufacturer:** Raytheon Beechcraft
- **Speed:** 570 km/h
- **Dimensions:** 14.2 m long, 4.4 m high, 17.7 m wingspan
- **Ceiling:** 35,000 ft (10.67 km)
- **Range:** 3400 km
- **Crew:** Two pilots or one pilot and one mission specialist student
- **Capacity:** Seven passengers.

**Operational Employment**

The KA350 King Air is a modern twin-engine turboprop, with a normal crew of two pilots and a range of over 2000 km. They have been used to support Australian Defence Force operations overseas in East Timor, Papua New Guinea and the Solomon Islands.

The King Air provides Air Force with a flexible light transport capability, used for training and development of aircrew, and transport of passengers within Australia and the immediate region.

Currently, eight King Airs are operated by No 32 Squadron at RAAF Base East Sale in Victoria. The aircraft are fitted with console-based training and simulation equipment and supported by a suite of ground-based simulators. These are used primarily for navigation training of air combat officers and maritime aviation warfare officers. They can also be used for transport duties, with capacity for seven passengers.
COMBAT SUPPORT GROUP
Mission: Prepare for and conduct flexible combat support operations

Bushmaster Protected Mobility Vehicles

Operational Characteristics
Manufacturer: Thales
Dimensions: 7.1 x 2.3 x 3.25 m (to top of wire cutters)
Max Road Speed: 100 km/h (limited)
Max Road Range: 800 km
Crew: up to 10

Operational Employment
The Bushmaster is a four-wheel drive (constant) on-road and off-road vehicle that is designed to transport ten troops including a driver, together with their weapons and equipment. The Bushmaster can itself be transported by road, rail or air. The hull is a fully welded monocoque (or single-shell) structure manufactured from armoured steel plate. Two square hatches and a gun ring with hatch are fitted in the roof, and a single access door is located at the rear of the vehicle. Two mounting points for quick-connect, swing-arm gun mounts are fitted to the roof and are accessed through the rear hatches. External mounting points are provided for the installation of a grenade launching system.

The power train consists of a Caterpillar diesel engine coupled to a ZF six-speed automatic transmission. The vehicle is fitted with a central tyre inflation system which provides a means of manually or automatically controlling the tyre inflation pressures based on terrain and vehicle speed, and to reduce the likelihood of tyre damage.
Light Weight G-Wagon

**Operational Characteristics**
- **Manufacturer:** Mercedes Benz
- **Dimensions:** 4.82 x 1.85 x 2.21 m
- **Max Road Speed:** As per posted speed limits
- **Fuel Tank:** 95 expandable to 150 litres
- **Crew:** 2

**Operational Employment**
The G-Wagon provides high-mobility, general-purpose, load transport. Available in several variants, it is an essential component of the support, sustainment, deployment and redeployment structure and can be used to transport combat supplies, materiel and replacement combat systems. The vehicles will accommodate a driver and a co-driver.

It can be used as a mobile command post or converted to an ambulance. Haulmark trailers provide the G-Wagon with extra payload capacity; the single-axle increases payload by 800kg and the tandem-axle provides a payload of 1500kg.
Military Working Dogs

**Operational Characteristics**

**Breeds:** German Shepherd and Belgian Shepherd Malinois

**Breeding:** RAAF breeding program (Amberley)

**Speed:** 20-30 km/h

**Crew:** Military working dog handler

**Operational Employment**

Military working dogs and their handlers are responsible for providing security, crime prevention patrols, emergency response and intruder detection at permanent air bases and deployed locations around the world. Both handlers and their dogs are tested regularly to ensure readiness to deploy at any time.

Dogs and handlers are carefully matched to ensure many years of loyal service. Once matched, handlers and their dogs work together to maintain a high standard of fitness and training. The dogs are often from Air Force’s own breeding program, and members of the public can volunteer to foster Air Force puppies.
Panther Airfield Fire Truck

Operational Characteristics
Manufacturer: Rosenbauer (Austria)
Engine: Detroit diesel
Dimensions: 11.75 x 3.30 x 3.60 m
Water Tank Capacity: 8500 litres
Crew: One driver, three firefighters

Operational Employment
The Panther is a high-performance six-wheel-drive vehicle which provides emergency response to aircraft incidents to save life and minimise damage. It is an on-and off-road vehicle with digital controls and an air-conditioned cab for the driver and crew of three. A two-stage centrifugal pump can project water and foam to a range of 70 m. Each truck can project 6200 litres per minute from its roof and bumper-mounted cannons. The Panther is also equipped with a Minimax dry-chemical-powder firefighting system.

A quick-attack hose reel and discharge outlets enable fire fighters to conduct offensive aircraft rescue and firefighting. Fully loaded, the Panther can accelerate to 80 km/h within 35 seconds.
Titan Firefighting Field Truck

Operational Characteristics
Manufacturer: E-One (US)
Engine: Detroit diesel
Dimensions: 7.9 m x 3.0 m x 2.9 m
Water Tank Capacity: 2800 litres
Crew: One driver, three firefighters

Operational Employment
The Titan is a four-wheel-drive vehicle used for aircraft rescue firefighting and structural rescue firefighting at permanent bases and in a deployed environment. Each vehicle is capable of continuous operation given sufficient supplies and personnel, and is capable of stationary firefighting or ‘pump and roll’ operation using a roof-mounted turret. The Titan carries a crew of four in an air-conditioned cab, with breathing apparatus built into the seating.
Woomera Range Complex

Operational Characteristics

Location: Defence Practice Area, located north-west of Woomera, South Australia.

Area: 124,000 km² (i.e., about the same size as England).

Operational Employment

The Woomera Range Complex (WRC) is comprised of:

- Woomera Test Range (WTR), including the Woomera Prohibited Area (WPA);
- Woomera Restricted Airspace (above the WPA);
- Nurrungar Test Area (outside WPA); and
- Woomera village including RAAF Base Woomera aerodrome.

The WRC is widely recognised as a unique capability for secure testing of long-range weapons, sensitive weapons systems and Unmanned Aircraft Systems (UAS), in support of Defence and National objectives.

Providing a highly specialised operations environment for the testing of war materiel, the WTR supports the conduct of research, experimentation, test and evaluation of ground-based and air weapons systems, including UAS and future sensitive weapons systems, for Australian and allied forces.

Under Part VII of Defence Force Regulation 35, the WPA is a declared prohibited area for the purposes of ‘testing of war materiel’. The WRC is in high demand for weapons testing and other specialised activities, as it is the only range remaining in the western world in which next-generation weapons systems can be tested safely, securely and within the land borders of the range. Defence use of the WPA is now operating under the Hawke Review’s new shared-access model which balances Defence and non-Defence use of the WPA. The new shared-access model recognises Defence as the primary user of the WPA.
AIR WARFARE CENTRE
Mission: Deliver integrated air warfighting solutions for superior combat effectiveness

History
The Air Warfare Centre (AWC) was created at the direction of CAF under Plan Jericho to address opportunities to improve Air Force’s ability to maximise the operational effectiveness of fifth-generation, networked capabilities through improved integration across Defence and increased knowledge sharing with allied AWCs.

Purpose
The AWC exists within Air Command and is critical to establishing the RAAF as a modern and fully integrated combat force that can deliver air and space power effects in the information age.

Organisation
Integrated Mission Support (IMS) provides central coordination and integration of tasking across the AWC. IMS includes an Innovation Hub which is the focal point for bottom up innovation to ensure the AWC can harness the skillsets spanning across the other Force Element Groups, other services, academia, and Defence Industry.

Information Warfare Directorate (IWD) centralises the Air Force’s tactical information warfare elements and provides the wider RAAF with an integrated and tailored information warfare operational capability drawn from the Intelligence, Electronic Warfare and Information Operations fields. IWD enables the coherent development and management of the RAAF’s Information Warfare capabilities.

Test and Evaluation Directorate (T&ED) delivers comprehensive, timely and integrated Test & Evaluation through a flight test squadron and a unique engineering/manufacturing capability. T&ED provides support and advice throughout a weapon system life-cycle including preview testing (risk reduction to inform acquisition), developmental, acceptance and operational T&E. It enables the warfighter through the
provision of specialist medical advice, research and training and aeronautical information service.

**Air Force Ranges Directorate (AFRD)** improves the way Air Force conducts Live, Virtual and Constructive simulation with other elements of Defence and our coalition partners in order to deliver more effective warfighters. AFRD will enhance the way Air Force tests war material and trains the warfighter. It will standardise all range requirements to deliver a more realistic and practical testing environment.

**Tactics and Training Directorate (T&TD)** is located at RAAF Base Williamtown and is tasked with the development of multi-discipline, high-end integrated tactics and training across the Air Force through a combination of training, education and integrated exercises.
PART 3 - GLOSSARY
**TERMINOLOGY**

**20mm aircraft ammunition.** 20mm aircraft gun ammunition is used by the M61A1/M61A2 aircraft automatic gun system configured in the F/A-18 Classic Hornet.

**30mm aircraft ammunition.** 30mm Aden aircraft gun ammunition is used by the Mk 127 Hawk Lead-In Fighter.

**Air & Space Operations Command & Control Capability System (ASO C2CS).** Software applications, deployable systems and specialist military equipment operating within the fixed and/or deployed Defence ICT environment to support the ADF command and control of ADF air operations.

**Air Intercept Missile–9M (AIM-9M) Sidewinder.** The 2.9 m long, 85 kg AIM-9M Sidewinder is a supersonic, infra-red homing, guided missile that provides the ability to attack from all directions, including head-on. Changes over early models meant an improved capability against infra-red countermeasures, enhanced background discrimination capability and a reduced-smoke rocket motor. These modifications increased its ability to locate and lock-on to a target and decrease the chance of missile detection.

**Air Intercept Missile–9X (AIM-9X) Sidewinder.** The 3 m long, 85 kg AIM-9X Sidewinder is a supersonic, infra-red homing, guided missile that provides the ability to attack from all directions, including head-on. Changes over early models meant an improved capability against infra-red countermeasures, enhanced background discrimination capability and a reduced-smoke rocket motor. These modifications increased its ability to locate and lock-on to a target and decrease the chance of missile detection.

**Air Intercept Missile–120 (AIM-120) Advanced Medium-Range, Air-to-Air Missile (AMRAAM).** The 3.6 m long, 157 kg AIM-120 AMRAAM provides an all-weather, active radar-guided missile with beyond-visual-range, air-to-air attack capability, as well as air defence support. Once the missile closes in on a target, its active radar guides it to an intercept.

**Air Intercept Missile–132 (AIM-132) Advanced Short-Range, Air-to-Air Missile (ASRAAM).** The 2.9 m long, 87 kg imaging infra-red homing ASRAAM is designed as a replacement for the AIM-9 Sidewinder. It has longer range (50 km) and higher speed (Mach 3+), but less manoeuvrability than the Sidewinder.

**Air-to-Ground Missile–84 (AGM-84) Harpoon Anti-Ship Missile.** The Harpoon is a 3.8 m long, all-weather, over-the-horizon, sea-skimming, 519 kg weapon for use against surfaced submarines and ships. It uses active radar homing to locate its target.

**Air-to-Ground Missile–88 (AGM-88) High-Speed Anti-Radiation Missile (HARM).** The AGM-88E is a tactical, supersonic, air-to-surface missile designed to home in on electronic transmissions coming from a ground-based radar system. Its 66 kg warhead is designed to destroy the transmitter. Air Force EA-18G Growler aircraft will carry a training version of the AGM-88.

**Air-to-Ground Missile–154 (AGM-154) Joint Stand-off Weapon (JSOW).** The JSOW is a 4.1 m long, 470 kg, medium-range, highly survivable, precision-guided weapon for attacking defended targets from outside the range of standard anti-aircraft defences, to increase aircraft survivability. It is a low-cost, highly lethal, ‘launch-and-leave’ glide weapon that employs a Global Positioning System (GPS)/inertial navigation system (INS) for mid-flight guidance and an infra-red seeker for terminal guidance. It is capable of day/night and adverse weather operation.

**Air-to-Ground Missile–158 (AGM-158) Joint Air-to-Surface Standoff Missile (JASSM).** The JASSM is a 4.3 m long, 974 kg, semi-stealthy, long-range (over 370 km), turbojet-
powered cruise missile. Its mid-course
guidance uses the INS/GPS unit developed
for the JDAM and JSOW guided bombs,
with either a high-level or low-level (500 m)
cruise altitude, followed by a steep dive
on to the target using an imaging infra-red
seeker.

**AN/ALQ–99 Tactical Jamming Pod.** This
pod is an airborne electronic warfare,
integrated jamming system used on EA-18G
Growler aircraft. The system is capable of
intercepting, automatically processing and
jamming received radio frequency signals.
The system receivers can also be used to
detect, identify and direction-find those
signals, providing signals intelligence either
automatically or manually.

**AN/ALQ–128 Wideband Receiver.** This
electronic warfare warning set is a countermeasure
receiver used to give information through
radar warning suites that allows it to provide
active jamming against adversary radar
threats.

**AN/ALR-56M Radar Warning Receiver.** This
receiver is the component of the electronic
warfare system used to detect threat radars
and provide situational awareness to the
aircrew and improve survivability.

**AN/APG-73.** This is an all-weather, multi-
mode, airborne radar system designed for
both air-to-air and air-to-surface operations.
It incorporates a variety of search, track and
track-while-scan modes to give the pilot a
complete look-down/shoot-down capability.
The AN/APG-73 is the radar that was fitted
to the F/A-18A/B Hornets during the Hornet
Upgrade Program.

**AN/APG-79.** The revolutionary AN/APG-79
AESA radar provides F/A-18E/F aircrews
with powerful new capabilities. Entirely new
from front-end array to back-end processor
and operational software, the system
substantially increases the power of the
F/A-18E/F Super Hornet. With more power
than the APG-73, the APG-79 has much
greater air-to-air detection range and allows
tracking of significantly more targets. It also
has a much better ability to identify targets
and break out those that are closely spaced.

**BDU-33 Practice Bomb.** The BDU-33 is a 25
lbs practice bomb used in air weapons
training. It is designed as a lower-costing,
non-explosive alternative to the Mk 80
series general purpose bombs that follow a
similar weapon ballistic trajectory.

**BLU-109/B Bomb.** BLU-109 is a special-
purpose 2000lbs high-explosive warhead
that is designed with a strengthened bomb
casing to improve its penetration through
hardened targets before functioning. It can
be configured with fin stabilizers and a
guidance control unit for improved precision
guidance.

**BLU-126 Low-Collateral Damage Bomb (LCDB).**
BLU-126 LCDB is a variant of the Mk 82
general purpose bomb, with a smaller
explosive charge, and configured with
JDAM-ER wing kits. It was developed for
use in situations where friendly forces or
civilians are situated dangerously close to a
target planned for an air strike, when other
weapon options may not be appropriate.

**Bomb.** A bomb is an aerodynamically-
shaped metal container, usually fin-
stabilised, filled with a high explosive,
smoke, incendiary or chemical composition
designed to be dropped from an aircraft.

**Conventional Bomb.** A conventional bomb
consists of five major parts: an outer casing,
the inner explosive material, devices such as
fins to stabilize the weapon in flight, one or
more fuses to ignite the main charge, and a
mechanism for arming the fuse or preparing
it to explode. The outer case is most
commonly made of metal and has a point at its nose. The explosive charge usually consists of trinitrotoluene (TNT) or other high explosives in combination. The fin assembly at the tail end of the weapon enables it to fall through the air nose-first, by the same principle as the feathers on an arrow.

**Electronic Attack.** That division of electronic warfare involving the use of electromagnetic energy, directed energy, or anti-radiation weapons to attack personnel, facilities, or equipment with the intent of degrading, neutralising, or destroying adversary combat capability and is considered a form of fires.

**General-Purpose (GP) Bomb.** This is an air-dropped weapon intended as a compromise between blast damage, penetration and fragmentation in explosive effect. They are commonly fitted with a guidance kit to create a precision-guided weapon.

**Glide Bomb.** A glide bomb has aerodynamic surfaces to give it a much flatter, gliding, flight path than that of a conventional bomb without such surfaces. This allows it to be released at a greater distance from the target, allowing a successful attack without the aircraft needing to pass within range of the target’s anti-aircraft defences.

**Global Positioning System (GPS).** GPS is a space-based satellite navigation system that provides location and time information in all weather conditions, anywhere on or near the surface of the Earth. However, to calculate positional data, the receiver requires an unobstructed line-of-sight to four or more of the system’s satellites.

**Guided Bomb Unit–12 (GBU-12) Laser-Guided Bomb.** A GBU-12 is 225 kg with a laser-guidance kit attached to it. When an operator illuminates the target with a laser designator, the weapon homes to a spot of laser energy reflected from the target.

**Guided Bomb Unit–24 (GBU-24) Laser-Guided Bomb.** Laser guidance bomb modification kits are used to modify a the Mk-84 general purpose 2000lbs bomb GBU-24(V)1/B and the BLU-109/B penetrator bomb into the GBU-24(V)2/B. When an operator illuminates the target with a laser designator, the modified weapon is able to home to a spot of laser energy reflected from the target, improving the guidance precision.

**Guided Bomb Unit–31 (GBU-31) GPS-Guided Bomb.** A GBU-31 is a 900 kg general-purpose bomb fitted with a JDAM guidance kit.

**Guided Bomb Unit–39 Small Diameter Bomb I (GBU-39 SDB I).** This is a 110 kg precision-guided glide bomb for attacking fixed targets but with less collateral damage. The bomb uses GPS/INS guidance to fly to the target. The small size allows an aircraft to carry a larger number of weapons.

**Guided Bomb Unit–53 Small Diameter Bomb II (GBU-53 SDB II).** This is a 110 kg precision-guided glide bomb that can identify and strike mobile targets from stand-off distances in all weather conditions. The bomb uses GPS/INS system to guide itself into the general vicinity of a moving target with any necessary course corrections provided using a data link. The bomb has three modes of target acquisition: active radar, infrared homing and semi-active laser.

**Inertial Navigation System (INS).** INS is a navigation aid that uses a computer, motion sensors and rotation sensors to continuously calculate, via dead reckoning, the position, orientation and velocity of a moving object without the need for external references. This system is sometime referred to as an inertial guidance system.

**Joint Direct Attack Munition (JDAM).** JDAM is a tail kit that contains an INS and a GPS guidance control unit that converts existing
unguided free-fall bombs into accurate, adverse weather ‘smart’ bombs. It enables employment of accurate air-to-surface weapons against high-priority fixed and relocatable targets from fighter aircraft and can be directed against single or multiple targets on a single pass. Once released from the aircraft, it autonomously navigates to the designated target coordinates, which can be loaded into the aircraft before take-off, manually altered by aircrew before weapon release, or automatically entered during target designation with onboard aircraft sensors. It can be launched from more than 25 km from the target with updates from GPS satellites to help guide the weapon to the target.

**Joint Direct Attack Munition – Extended Range (JDAM-ER).** JDAM-ER is a tail kit that contains an INS and a GPS guidance control unit that converts existing unguided free-fall bombs into accurate, adverse weather ‘smart’ bombs. It enables employment of accurate air-to-surface weapons against high-priority fixed and relocatable targets from fighter aircraft and can be directed against single or multiple targets on a single pass. Once released from the aircraft, it autonomously navigates to the designated target coordinates, which can be loaded into the aircraft before take-off, manually altered by aircrew before weapon release, or automatically entered during target designation with onboard aircraft sensors.

**Laser-Guided Bomb.** This is an aerial weapon that uses semi-active laser homing to strike a designated target with greater accuracy than an unguided bomb. It uses on-board electronics to track targets that are designated by laser, typically in the infra-red spectrum, and adjust the weapon’s glide path to precisely strike the target. Since it is tracking a light signature, not the object itself, the target must be illuminated by a laser.

**Joint Direct Attack Munition (LJDAM).** LJDAM is a JDAM tail kit with an added laser sensor giving the LJDAM the ability to attack moving, relocatable and maritime targets. The target must be designated by a laser from a separate source, either by ground forces, by a pod on the attacking aircraft, or by a separate support aircraft.

**Link-16.** Link 16 is a military tactical data exchange network which allows military aircraft as well as ships and ground forces to exchange their tactical picture in near-real time, as well as supporting the exchange of text messages, imagery data and providing two channels of digital voice.

**Link-22.** Link 22 is a secure digital radio link in the high-frequency and ultra-high-frequency bands, designed for use by military forces.

**M61A1/M61A2 20mm Automatic Gun.** This is a hydraulically driven, 6-barreled, rotary-action, air-cooled, electrically fired weapon mounted in the nose of the F/A-18 Hornet, with selectable rates of fire of either 4000 or 6000 rounds per minute.

**Mk-46 Air-Launched Lightweight Torpedo.** This is a 2.6 m long, 276 kg, air-dropped naval weapon designed to attack high-performance submarines to a maximum depth of 365 m.
Mk-54 Barracuda Torpedo. This is a 2.7 m long, 230 kg naval anti-submarine weapon. The MK-54 is the next-generation of the MK-46 and can be released from most anti-submarine warfare aircraft or naval ships. The P-8A Poseidon uses a GPS-guided parachute kit to drop the Mk-54 from high altitude to track, classify and attack underwater targets.

Mark 80-series General Purpose Bombs. Air Force employs Mk 82 (500lbs), Mk 83 (1000lbs) and Mk 84 (2000lbs) general-purpose bombs. These bombs may be employed as conventional unguided weapons. These bombs are reconfigurable with aerodynamic fin stabilizers to extend their range and guidance control system for improved precision guidance.

Markers Marine and Sea Markers. Pyrotechnic markers are deployed, from appropriately configured aircraft, to provide a day or night visual reference point on the water surface, especially during anti-submarine warfare and search-and-rescue missions.

Missile. A missile is a self-propelled weapon whose trajectory or course is controlled while in flight.

Practice Bomb. A practice bomb -Bomb Dummy Unit (BDU)- is an inert variant of an operational weapon that has similar mass and flight characteristics as the high explosive variant. BDUs are used to train pilots in the different flight characteristics of an aircraft carrying and releasing a bomb load; the BDU also flies a similar flight trajectory as the high explosive variant in weapons practices.

Precision-Guided Bomb. This is a guided, air-dropped weapon intended to precisely hit a specific target and minimise collateral damage. It is sometimes referred to as a ‘smart’ bomb.

Smoke Grenade. The PC9/A is configured to carry a Smoke Grenade Dispenser for release smoke grenades to mark ground targets in a coordinated effort with a Joint Tactical Air Controller (airborne or groundborne) during Forward Air Control training sorties.

Sonobuoy. A sonobuoy is a sonar or acoustic device that is dropped in water and used to detect submerged submarines. When activated, it relays information to the aircraft by radio. It may be active directional or non-directional, or it may be passive directional or non-directional.

Space Surveillance Telescope (SST). The SST meets a capability gap in detecting and tracking satellites on the geostationary orbit situated over the eastern hemisphere. It was designed by the US Defence Advanced Research Projects Agency and is installed at Naval Communications Station Harold E Holt (HEH), located north of Exmouth, Western Australia. It is and operated by Australian space crews in 1RSU.

Space Surveillance Radar. The C-band space surveillance radar is installed at HEH. Its mission is to provide southern hemisphere coverage of resident space objects for catalogue maintenance, space object identification, and support for special events. It is and operated by Australian space crews in 1RSU.

Torpedo. A torpedo is a self-propelled, underwater munition containing explosives that detonate upon impact with the ship or submarine being targeted.

Unguided Bomb. This conventional, aircraft-delivered weapon does not contain a guidance system. When released, it follows a ballistic trajectory to the Earth. It is also called a free-fall bomb or ‘dumb’ bomb.
## ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>AAFC</td>
<td>Australian Air Force Cadets</td>
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<tr>
<td>ABATS</td>
<td>Air Base Air Traffic Services</td>
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<tr>
<td>ACAUST</td>
<td>Air Commander Australia</td>
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<td>ACG</td>
<td>Air Combat Group</td>
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<td>ADF</td>
<td>Australian Defence Force</td>
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<tr>
<td>ADGE</td>
<td>Air Defence Ground Environment</td>
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<tr>
<td>AEA</td>
<td>Airborne Electronic Attack</td>
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<tr>
<td>AEW&amp;C</td>
<td>Airborne Early Warning and Control</td>
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<tr>
<td>AFHQ</td>
<td>Air Force Headquarters</td>
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<tr>
<td>AFC</td>
<td>Australian Flying Corps</td>
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<tr>
<td>AFI</td>
<td>Air Force Improvement Program</td>
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<tr>
<td>AFTG</td>
<td>Air Force Training Group</td>
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<tr>
<td>AGO</td>
<td>Australian Geospatial-Intelligence Organisation</td>
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<tr>
<td>AirA</td>
<td>Air Academy</td>
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<td>ALS</td>
<td>Air Logistics Support</td>
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<tr>
<td>AMCC</td>
<td>Air Mobility Control Centre</td>
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<tr>
<td>AME</td>
<td>Aeromedical Evacuation</td>
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<td>AMG</td>
<td>Air Mobility Group</td>
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<tr>
<td>AMTDU</td>
<td>Air Mobility Training and Development Unit</td>
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<tr>
<td>AMTS</td>
<td>Air Mission Training School</td>
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<tr>
<td>AOC</td>
<td>Air and Space Operations Centre</td>
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<tr>
<td>AP-3C</td>
<td>Orion maritime patrol aircraft</td>
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<td>APDC</td>
<td>Air Power Development Centre</td>
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<td>APS</td>
<td>Australian Public Service</td>
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<tr>
<td>ASM</td>
<td>Airspace Management</td>
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<tr>
<td>ASW</td>
<td>Anti-Submarine Warfare</td>
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<td>ASuW</td>
<td>Anti-Surface Warfare</td>
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<tr>
<td>ATC</td>
<td>Air Traffic Control</td>
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<tr>
<td>ATM</td>
<td>Air Traffic Management</td>
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<tr>
<td>AWC</td>
<td>Air Warfare Centre</td>
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<tr>
<td>BFTS</td>
<td>Basic Flying Training School</td>
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<tr>
<td>C-130J</td>
<td>Hercules medium-transport aircraft</td>
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<tr>
<td>C2</td>
<td>Command and Control</td>
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<tr>
<td>C-27J</td>
<td>Spartan battlefield airlifter</td>
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<tr>
<td>C3ISR</td>
<td>Command, Control, Communications, Intelligence, Surveillance, and Reconnaissance</td>
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<tr>
<td>CAF</td>
<td>Chief of Air Force</td>
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<tr>
<td>CASG</td>
<td>Capability Acquisition and Sustainment Group</td>
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<td>CCT</td>
<td>Combat Control Team</td>
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<td>CDF</td>
<td>Chief of Defence Force</td>
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<td>CIMIC</td>
<td>Civil/Military Cooperation</td>
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<td>CJOPS</td>
<td>Commander Joint Operations</td>
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<td>CSCC</td>
<td>Combat Support Control Centre</td>
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<td>CSG</td>
<td>Combat Support Group</td>
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<tr>
<td>DCAF</td>
<td>Deputy Chief of Air Force</td>
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<tr>
<td>DGACOPS</td>
<td>Director General Air Command Operations</td>
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<td>DGCP-AF</td>
<td>Director General Capability Planning–Air Force</td>
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<td>DGACC-AF</td>
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<td>DGACE-AF</td>
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<td>DGLOG-AF</td>
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<td>DGRES-AF</td>
<td>Director General Reserves–Air Force</td>
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<td>DGS-AUS</td>
<td>Distributed Ground System – Australia</td>
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<td>DGSP-AF</td>
<td>Director General Strategy and Planning–Air Force</td>
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<td>DGTA</td>
<td>Director General Technical Airworthiness</td>
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<tr>
<td>DPA</td>
<td>Gazetted Defence Practice Area</td>
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<tr>
<td>DST</td>
<td>Defence Science Technology</td>
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<tr>
<td>E-7A</td>
<td>Wedgetail airborne early warning &amp; control</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>EA-18G</td>
<td>Growler Airborne Electronic Attack</td>
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<tr>
<td>EMS</td>
<td>Electromagnetic Spectrum</td>
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<tr>
<td>EWBM</td>
<td>Electronic Warfare Battle Management</td>
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<tr>
<td>F-35A</td>
<td>Lightning II fighter/attack aircraft</td>
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<tr>
<td>F/A-18A/B</td>
<td>Hornet fighter/attack aircraft</td>
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<td>F/A-18F</td>
<td>Super Hornet fighter/attack aircraft</td>
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<td>FAC</td>
<td>Forward Air Control</td>
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<tr>
<td>FEG</td>
<td>Force Element Group</td>
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<td>FLEW</td>
<td>Force Level Electronic Warfare</td>
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<td>GPS</td>
<td>Global Positioning System</td>
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<tr>
<td>HQAC</td>
<td>Headquarters Air Command</td>
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<tr>
<td>HQJOC</td>
<td>Headquarters Joint Operations Command</td>
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<tr>
<td>INS</td>
<td>Inertial Navigation System</td>
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<tr>
<td>ISR</td>
<td>Intelligence, Surveillance, and Reconnaissance</td>
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<tr>
<td>JAISREE</td>
<td>Joint Airborne ISR Exploitation Environment</td>
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<tr>
<td>JEWOSU</td>
<td>Joint Electronic Warfare Operational Support Unit</td>
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<td>JORN</td>
<td>Jindalee Operational Radar Network</td>
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<td>JTAC</td>
<td>Joint Terminal Attack Controller</td>
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<td>KA350</td>
<td>King Air 350</td>
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<tr>
<td>KC-30A</td>
<td>Multi-Role Tanker Transport</td>
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<tr>
<td>LIF</td>
<td>Lead-In Fighter</td>
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<tr>
<td>MCRC</td>
<td>Mobile Control &amp; Reporting Centre</td>
</tr>
<tr>
<td>MESA</td>
<td>Multi-role Electronically Scanned Array</td>
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<tr>
<td>MISRR</td>
<td>Maritime Intelligence Surveillance Reconnaissance and Response</td>
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