# The ADF's new Multi-Role Tanker Transport capability

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The ability of strategic airlift and air-to-air refuelling (AAR) to increase operational combat options make them extremely valuable capabilities. This contribution to operations has shaped development towards the multi-role capable aircraft being acquired by the Royal Australian Air Force (RAAF) and considered by virtually all other contemporary air forces, including the United States Air Force (USAF).

The first real demonstration of AAR occurred in the United States (US) in 1923, when a DH-4B biplane was kept airborne for more than 37 hours. Despite AAR remaining a dangerous activity, by 1935, the record for the longest refuelled flight was in excess of 27 days! The effectiveness of AAR as an operational capability was initially demonstrated during the Vietnam War. Several significant examples have followed, including the Black Buck series of very long-range strikes launched from Ascension Island during the Falklands War, and ultimately during Operation *Desert Storm* when USAF B52s flew 35-hour bombing missions over the Persian Gulf from the continental US.

The Boeing 707-338 tankers which currently provide the Australian Defence Force's (ADF) AAR capability were purchased as a 'training capability' but have since seen operational service on several occasions. They were part of Operation *Desert Watch* in 1998 and Operation *Slipper* in Kyrgyzstan in 2002. During the latter deployment, the RAAF tankers completed in excess of 800 refuellings, transferring more than six million pounds of fuel. These operations were complemented by the fleet carrying out ongoing strategic airlift.

*Mid-air refuelling. Credit: Department of Defence*

The evolution of AAR capability has seen the development of two key systems: probe and drogue, developed by the United States Navy (USN); and boom, developed by the USAF. Both systems have their advantages and limitations. The boom system was developed to enable the higher fuel-transfer rates required by large receiver aircraft such as the B52. This, however, limits each tanker to a single boom, whereas the USN probe and drogue system is readily adapted to smaller aircraft and allows for multiple concurrent receivers, albeit at around one third of the boom transfer rate.

Until the development of the KC-10, each tanker was essentially limited to one type of refuelling, virtually doubling the number of

tankers required for operational receiver flexibility. As a result of the lessons learned from the limitations of previous tankers, the KC-10 is fitted with both systems and – more importantly – with the capability to use both systems during a single sortie. Coupled with a significant cargo capacity, this made the KC-10 arguably the first Multi-Role Tanker Transport (MRTT) aircraft. These capabilities are being continually refined and the ADF's new KC-30B is one resultant product.

Designated A39, the KC-30B is a derivation of the Airbus A330-200 airliner. Significant modifications to the aircraft have seen it fitted with both probe and drogue, and boom, refuelling systems. An Aerial Refuelling Operator uses a remote three-dimensional camera system to operate the refuelling systems from the cockpit. The aircraft is also able to receive fuel via boom, greatly enhancing its operational flexibility. The KC-30B is a very large aircraft with a maximum take-off weight of 233 tonnes, seating 270 passengers plus 35 tonnes of under-floor cargo and a fuel load of around 111 tonnes. These figures represent a significant increase over the current B707; most telling being the capability to offload more than 65 tonnes of fuel at 1000 nautical miles from base, representing a 147 per cent increase in the operational envelope. The modern systems used within the aircraft also offer a significant increase in reliability and efficiency: airlines have achieved a 98 per cent dispatch rate for the A330. However, because of the increased size of the aircraft, there is a limitation on airfields from which it can effectively operate, particularly at high gross weights.

The KC-30B represents a significant capability for the ADF. It will provide the ability to deploy a fighter squadron across the Australian continent in one step, including the carriage of all of the unit personnel and most of the required support equipment. Alternatively, the capability represents the ability to move 2000 personnel across 2000 miles in 24 hours.

*A KC-30 refuelling a C-17 Globemaster.*
*Credit: Department of Defence*

An MRTT aircraft in isolation is not a weapon system. One view of the tanker's role is that it is more akin to the shaft of a spear that carries the tip to the target, and not the tip itself. The ability to project weapons further has always been a part of the hunter/warrior mindset: consider the Aboriginal 'woomera', a tool that enables spears to be thrown further. Fighter aircraft designs have always been compromised by the need to find the right mixture of size, agility, range and overall capability. Invariably, a fighter aircraft has relatively limited range, hampered further by the carriage of weapons. The limitations of range are felt strongly when dealing with a continent the size of Australia. As stated in the ADF's *Air Power Manual*, 'Australia's geography means that even domestic deployments can be considered expeditionary by almost any standard.' Limitations in range can be overcome by AAR increasing the geographical area where precision effects can be created and strategic attacks undertaken.

Impermanence has been argued as a weakness of air power in the past. The acquisition and introduction of the KC-30B's

significant AAR capability enhances both real and virtual persistence.

*An A39-001 touching down. Credit: Department of Defence*

More importantly, AAR and the strategic lift offered by the KC-30B will enable air power to support land and maritime forces. It will do this by providing an increasing ability to degrade or destroy adversary forces through counter land and counter sea operations before they are able to close with friendly forces across the spread of Australia's region. With adequate AAR, the ability to provide offensive air power over sovereign Australian territories, such as Christmas Island, will become a reality. Much like the B707 operations during Operation *Desert Watch*, the KC-30B will increasingly offer the Australian Government force options to be part of international coalitions, particularly where a presence is required and yet the risk on the ground is too high.

The combined AAR and strategic lift capability of the KC-30B, in concert with the C-17 Globemaster and C-130 Hercules, will enhance the operational effectiveness of other elements of the ADF, especially land forces, by leveraging some of the key characteristics of air power such as reach, penetration, responsiveness, versatility, flexibility, concentration of force and concurrent operations. When combined with the delivery of offensive air power through supporting the air combat force, the new KC-30B will help the ADF realise the full flexibility that air power can offer.

- *AAR is a key component of the Air Force's capability to create persistent effects in expeditionary operations.*

- *The reach and capacity of the new MRTT provides enhanced mobility and force application options for joint forces.*

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