

PATHFINDER

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C-130 HERCULES: FIFTY YEARS IN RAAF SERVICE

If...the F-111 is the most significant aircraft the RAAF has ever operated, since World War II at least, the Hercules follows closely. It is difficult to overstate the importance of the Hercules to national defence.

—Dr Alan Stephens (1995)

2013 marked ten years of continuous operations by RAAF C130s in the Middle East, a formidable milestone for any unit and capability in the ADF. This deployment, however, is only one chapter in the history of the C130 in RAAF service. The RAAF has operated C130s for over 50 years, with four different variants from the C130A to C130J conducting missions across the full spectrum of operations from peacetime humanitarian assistance to conventional warfare. The Australian experience is far from unique, with over 70 countries currently operating at least one variant of the type.

So how does one explain the exceptional popularity, longevity and utility of this ubiquitous platform? One approach would be to measure the platform's capability against the characteristics of air power—those key attributes of the air domain that are important to understand in order to realise the full potential of air power. Exploring how the design and operation of the C130 embodies and exploits some of the more relevant characteristics of air power—*speed, reach, payload, precision, flexibility and dependency* - gives some insight into the success of this aircraft.

The characteristics of air power are interdependent, and can be analysed and applied in clusters. The first cluster to be examined in relation to the C130 comprises of Reach, Speed, Payload and Precision. The C130As introduced into service in 1958 were the first turboprop aircraft operated by the RAAF. The new engine resulted in a combination of efficiency and speed that gave the C130 a *reach* that enabled it to cover the entire South East Asia and the Southern and Western Pacific regions, a capability repeatedly employed over the next five decades. A series of Defence White Papers has

consistently emphasised the importance of the area for Australia's national security.

The C-130s' ability to deliver passengers and cargo to destinations in the Asia-Pacific region, in response to natural disasters and in conducting Search and Survivor Assistance missions in the Southern Ocean, has been of great benefit to Australia. The archipelagic nature of the region, as well as Australia's reliance on maritime transportation for its economic well-being has made this an essential capability for the RAAF. The C130 transits up to twenty times quicker than surface transport and is largely uninhibited by physical barriers of geography. Its transit *speed* is complemented by an effective cargo handling system and ramp, enabling it to offload cargo quickly and efficiently both on the ground and when airborne, further increasing its mission effectiveness.

The C130 cannot match the sheer bulk capacity of the planned Canberra-class Land Helicopter Dock (LHD) and carries a lesser *payload* than its stable mate the C-17. It can, however, deliver a useful load of either 128 personnel; 8 pallets of cargo; military or civilian vehicles; small surface vessels; or aircraft up to the size of a Black Hawk. Surprisingly, in many cases, the most important load on the C130 is the humble forklift, a critical enabler for any air mobility operation. Thoughtful load planning, whether loading equipment, supplies, medical teams or advance parties, can fully exploit the C130s flexible payload capability.

The final characteristic in the cluster, *Precision*, is more often associated with the strike role than air mobility. The C130, however, can exploit precision not only through accurate airdrop using GPS-guided parachutes such as the Joint Precision Air Drop System

	C130A	C130J
Entry into RAAF	1958	1999
Power Plant	4 x Allison T56-A-11 (3,750eshp)	4 x Rolls-Royce AE 2100D3 (4700hp)
Length	29.79 m	34.37 m
Max Takeoff weight	56,337 kg	79,378kg
Max payload	16,601 kg	19,598kg
Service Ceiling	34,000 ft	40,000 ft
Cruise Speed	595 km/hr	643 km/hr



Cargo being loaded into a C-130J Hercules on the RAAF Base Amberley flight line

(JPADS), but also through generating a precise effect by delivering its load to, or extracting one from, a location at the critical time. Examples of this include the 1997 evacuation of 450 personnel from Phnom Penh by six RAAF C130 sorties, or in a more spectacular fashion when four Israeli C130s delivered a commando force 4000km to Entebbe airport in Uganda to rescue airline hostages in 1976.

Just as an effective understanding and employment of the air power characteristics can generate positive effects, poor application can result in limitations on the utility of the C130. Without centralised control of an air mobility force, C130 missions can be wasted if the aircraft is not fully utilised, either through suboptimal loading, or empty transit sectors. The ADF has employed centralised control and load allocation, provided by the Air and Space Operations Centre, Air Mobility Control Centre and No 1 Joint Movement Group, to mitigate this limitation. Effective management and coordination can optimise C130 loads from different Services, countries, or non-government organisations.

The two characteristics of **Flexibility** and **Dependency** are also critical to the optimised employment of the C130. Its robust design has not only allowed it to perform a number of roles such as airborne operations and aeromedical evacuation, but also enabled a wide range of modifications; the USAF AC-130H gunship and the KC-130 tankers used by many air forces are the most poignant examples of this. In RAAF service, modifications such as self-protection systems have increased the RAAF C130s' capability, exploiting the flexibility and versatility inherent in this aircraft.

The strengths of the C130 can be impacted by the final air power characteristic of **dependency**: the reliance air power has on ground support. Without a suitable airfield or drop zone or without an effective training and safety framework and maintenance capability, the **reach, speed, payload** and **precision** capabilities of a C130 can be critically inhibited. Poor maintenance and management of these complementary capabilities and enablers can significantly impact the effects the C130 can generate.

The success and longevity of the C130 can be attributed to how the aircraft, and the personnel that operate it, have been able to exploit the air power characteristics inherent in it. The **speed, reach, payload, precision and flexibility** of the C130 has provided an invaluable service to Australia for more than five decades, and is particularly suited to the large area of responsibility and overseas deployments of the RAAF. Complemented by its new air mobility stable mates of the KC-30, C-17, C-27J and KA350, the C130 can be relied on to generate quality air power for decades to come.

Key Points

- *The optimal employment of air power requires an understanding of its characteristics, an integral part of professional mastery*
- *The C130's design and capabilities are well suited for Australia's geographic environment and overseas operational requirements*
- *The success of the C130 can be attributed to how the aircraft exploits the air power characteristics of speed, reach, payload, precision and flexibility*



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