AIR POWER AND THE MARITIME TACTICAL UAS

The next generation of air and naval forces will be characterised by technologies that enhance our situational awareness and tactical reach.

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The importance of air power to military operations has reached the point that aviation platforms and systems have become common in the orders-of-battle of land and maritime forces and are no longer confined predominantly to air forces. This is certainly the case with the ADF, even though the delivery of air power remains the core role of Air Force and so requires all Air Force members to be air power professionals. As air power professionals, we must understand not only how air power is delivered by our own Service but also by a joint and integrated ADF. The unmanned aircraft system (UAS) provides an excellent example of how all three Services use a similar platform type to deliver air power for different but coherent purposes.

The UAS effectively addresses one of the shortcomings of air power—impermanence. As described in a recent Pathfinder, the main battle tank provides overt permanence in the land environment. The UAS can complement this with its attributes of low probability of counter detection, persistent overwatch or wide-area search and, in the case of armed UAS, kinetic response options. These attributes also provide a cogent case for the use of UAS in uncontested maritime environments.

Warships provide an overt and persistent maritime presence, akin to that of the tank in the land environment. The submarine provides a persistent covert surveillance, strategic strike and threat-in-being capability. The maritime commander’s ability to manoeuvre these relatively slow (in relation to aircraft) platforms to maintain the initiative against an adversary depends on a high level of situational awareness.

Providing persistent input to the common maritime operating picture is a role for the maritime tactical UAS (MTUAS). Land-based ISR assets are often constrained by range and endurance from contributing to this picture while scarce space-based assets cannot always be responsive to the needs of the tactical commander. An embarked MTUAS provides an accessible capability for a naval task group (NTG) that can augment land and space-based assets when they are available.

Persistent maritime ISR is primarily focussed on identifying and monitoring all contacts within the (moving) NTG’s area of interest. This is subtly different to the main purpose of ISR in the land environment—the continuous observation of a (stationary) specific area of interest. The maritime ISR asset usually looks FOR something, whilst the land ISR asset usually looks AT something. This difference determines the types of sensors and air vehicles most suitable for the maritime ISR task, which in turn can affect the analysis tools and personnel required.

Sustainment of sensors airborne for long periods of time is a task particularly suited to an unmanned system. In most operational maritime scenarios, situational awareness and combat-effectiveness can be meaningfully augmented by UAS—either organic to the vessels or tasked in support.

1 Pathfinder #268 – Air Power and the Main Battle Tank, published 27 June 2016.
Defence White Paper 2016 makes provision for the acquisition of land-based, Air Force operated UAS systems: the MQ-4C Triton ISR UAS and a yet-to-be identified armed ISR UAS. The White Paper also signals the intent to acquire MTUAS that are capable of being embarked and operated from a range of vessels. These systems, when combined with Air Force and Army UAS, will provide the joint force with layered and flexible options to support operations in all domains.

Navy intends to operate its tactical UAS in support of task groups, the usual operational organisation for its warships. Capital ships, such as the Canberra Class LHD and Hobart Class DDG, will provide the core around which amphibious task groups (ATGs) and surface action groups (SAGs) will be formed. This will require the MTUAS to operate in two key environments—the littoral and maritime. In the littoral, UAS will support amphibious operations by providing effects such as rapid environmental assessment, local area ISR and targeting. In the maritime environment, UAS will support SAGs by providing wide-area ISR, anti-surface warfare, anti-submarine warfare, battle-damage assessment and electronic warfare.

MTUAS are by definition organic, meaning they are under command of the officer in tactical control and used as an extension of the ship’s or task group’s own sensors. Given the limited space available on naval vessels, maritime UAS must be compact including mission control systems; launch, recovery and maintenance equipment; air vehicles, payloads and spares. As naval deployments may last up to nine months without access to deeper maintenance facilities, embarked UAS systems must be low-maintenance. Finally, given the limited cabin-space of naval vessels, the UAS crew has to be small, making the system personnel efficient.

Collectively, these requirements dictate that MTUAS must be smaller than its land-based equivalent yet still capable of meeting the full range of UAS operational requirements. However, there is some latitude for capital ships such as LHDs. Maritime UAS must be a flexible system capable of supporting multiple payloads that can be rapidly reconfigured to meet mission-specific requirements. The maritime operating environment also dictates that the MTUAS operate within radio line-of-sight rather than relying on less-certain, over-the-horizon datalinks such as broadband SATCOM. MTUAS must maintain constant communication directly with the controlling ship or task group, which if required, can then ‘re-broadcast’ ISR information. This does not prevent the UAS also being able to transmit data to multiple task group assets, however the command element requires consistent connectivity.

Current MTUAS require line of sight connectivity and this limits the value proposition of UAS autonomy. Nevertheless, high levels of automation are highly desirable in order to reduce the number of personnel required to operate the platform and undertake processing, exploitation and dissemination of the gathered data.

While this discussion has focussed on the unarmed ISR UAS in the maritime domain, developments in land-based UAS indicate further development of the maritime UAS is likely. Given their significant deck and hangar spaces, Canberra Class LHD are capable of employing sophisticated and capable MTUAS or even medium-sized strategic UAS.

Key Points

• The persistence of naval vessels on operations favours embarked UAS to provide sustainable situational awareness.
• Embarked Maritime Tactical UAS complement other maritime air power assets.
• Maritime UAS will develop to complement the maritime air power provided by Air Force under emerging joint operating concepts.