



# ATLAS

## *COLLABORATIVE COMBAT VARIANT*



**BAE SYSTEMS**

# ATLAS

## COLLABORATIVE COMBAT VARIANT



*Developed in-house by BAE Systems Australia, the ATLAS CCV is a new uncrewed ground combat vehicle designed as a battlefield companion to crewed armoured fighting vehicles and logistics vehicles.*

*Images: BAE Systems*

THE AUTONOMOUS TACTICAL Light Armour System (ATLAS) Collaborative Combat Variant (CCV) is an innovative uncrewed ground vehicle (UGV) of modular design, aimed at meeting the dynamically evolving future requirements of Western armoured ground forces.

Lightweight, highly mobile and with proven lethality, the ATLAS CCV is tailor-made for combat operations in support of armoured forces, reducing cognitive load, enhancing survivability and maximising the potential for success in combat operations.

The ATLAS CCV and the Vantage Automated Turret System

(ATS) have been developed with intimate support to crewed armoured platforms in mind, using operationally proven military off-the-shelf sub-systems to develop a high mobility, protected and lethal companion vehicle that is able to operate effectively with main battle tanks (MBT), infantry fighting vehicles (IFV), combat reconnaissance vehicles (CRV) and logistics vehicles, both on-road and off-road in complex terrain.

The 10-tonne mass (payload dependent) and the high-mobility driveline grants significant mobility advantages to the ATLAS CCV, allowing it to traverse terrain that today's tracked and heavy wheeled armoured vehicles may find challenging.

“This makes the ATLAS CCV an excellent platform for advanced reconnaissance, armoured overwatch and flank protection roles in littoral environments and in complex terrain, significantly reducing the exposure to expensive crewed platforms,” said Kisa Christensen, director of the Red Ochre Autonomy and Sensors line of business at BAE Systems Australia.

The company has developed the ATLAS CCV as an attritable system that delivers a logistics multiplier effect, rather than being an additional logistics burden to ground forces. The extensive use of common in-service sub-systems, such as the Supacat HMT drive-line and the use of the Bushmaster M242 25mm cannon enables the use of existing logistics supply chains, operator and maintainer training, ammunition and spare parts, driving down the cost of ownership.

The logistics multiplier effect also includes up to several tonnes of residual payload capacity offering the ability to extend the deployed endurance of crewed companion vehicles, with the ATLAS CCV able to carry a full first-line resupply of fuel or ammunition, rations and water for crewed platforms.

The BAE Systems team has ensured that administrative and operational transportability is integral to the ATLAS CCV design, with the turreted version transportable in a standard 20-foot ISO shipping container or on a standard 20-foot ISO flat-rack. This ensures safe and efficient transport of the ATLAS CCV using both existing military and civilian operational and strategic methods of transport, including by sea, rail and air.

The ATLAS CCV has advanced levels of autonomy hardware, sensors and software that maximise the passive operation of both the vehicle and the turret, minimising the risk of detection by enemy forces and maximising the survivability of the vehicle. The Vantage ATS only requires human approval for weapon firing.

This advanced autonomy technology is underpinned by BAE Systems’ Vehicle Management System, Mission Management System and Payload Management System.



**ABOVE: The ATLAS CCV is equipped with a 25mm gun turret, 8x8 mobility and an advanced autonomy and command, control and communications suite.**

The ATLAS CCV has been developed to operate passively using all of the standard modes of autonomous operation, including tele-operation, follow-me and waypoint navigation, coupled with the passive, highly automated operation of the turret that has been optimised for operation on uncrewed ground vehicles, on optionally crewed vehicles and on crewed vehicles and surface vessels.

With inherent flexibility built into the ATLAS CCV, its modular design facilitates many mission role payloads to be integrated with the platform in the field. These include direct fire medium and larger caliber turret systems, automated mortar systems, anti-tank guided missile launchers, loitering munitions launchers and reconnaissance and surveillance payloads.

The ATLAS CCV with the Vantage ATS is the future-oriented combat companion vehicle for today’s MBT, IFV and CRV, offering tangible reconnaissance, strike and fire support capabilities.

## CONTENTS

The UGV Advantage .....	4
Deployability .....	5
ATLAS CCV Concept of Employment .....	6
Technology & Design .....	8
The Brains Behind ATLAS CCV .....	10
Tactical Resupply .....	11

# THE UGV ADVANTAGE



UNMANNED VEHICLES HAVE been successfully used by militaries all over the world to extend reach, remove personnel from harm and effectively increase combat power with little overhead.

The use of UGVs is becoming increasingly important in modern combat operations. The threat of improvised explosive devices, conventional anti-vehicle mines and the evolution of small armed drones has significantly increased the risk to personnel and combat vehicles.

The ATLAS CCV allows a force to conduct difficult and dangerous tasks without exposing soldiers to those missions that are considered very high risk. A combat vehicle that can be trusted to complete tasks in support of a manned force element not only removes soldiers from harm's way but also increases the available workforce for other tasks.

"The ATLAS CCV is capable of undertaking the dirty and dangerous tasks such as direct fire support, obstacle clearance, combat reconnaissance or very short-range air defence. All of these tasks place an armoured vehicle and its crew at significant risk," said Stuart Bryden, business development manager - autonomy at BAE Systems Australia.

Recent conflicts have highlighted the risk that military fighting vehicles face on the modern battlefield. Certainly, any armoured fighting vehicle moving around the battlespace is likely to be considered high value for an adversary and be subject to targeting.

As a result, the use of unmanned platforms such as the ATLAS CCV family of vehicles becomes a force multiplier

**ABOVE: The ATLAS CCV family of vehicles becomes a force multiplier by providing combat mass without exposing humans to an adversary.**

by providing combat mass without exposing humans to an adversary.

The ATLAS CCV is not only a true fighting vehicle with the mobility of modern armoured vehicles, it is also designed to be a 'wingman' to infantry fighting vehicles, tanks and reconnaissance vehicles. With a significant payload capacity and versatility, the ATLAS CCV family of vehicles can form an autonomous fighting force for machine teaming or man-machine teaming.

The additional benefit to the use of UGVs such as the ATLAS CCV is the impact on workforce planning. The ATLAS CCV ground station could eventually allow a single operator to control multiple vehicles at one time. This allows an operator to execute a counter-UAV mission in support of an advance to contact or conduct a support by fire to suppress an enemy position for an attack. This type of mission with up to four manned vehicles would previously require up to 30 soldiers to execute.

The ATLAS CCV is the first in its class that can generate combat mass with an armoured force as part of a man-machine team. Reducing the number of soldiers that are exposed to significant risk on the battlefield has become an essential requirement for modern armies that maintain the capacity to conduct combat operations.

# DEPLOYABILITY

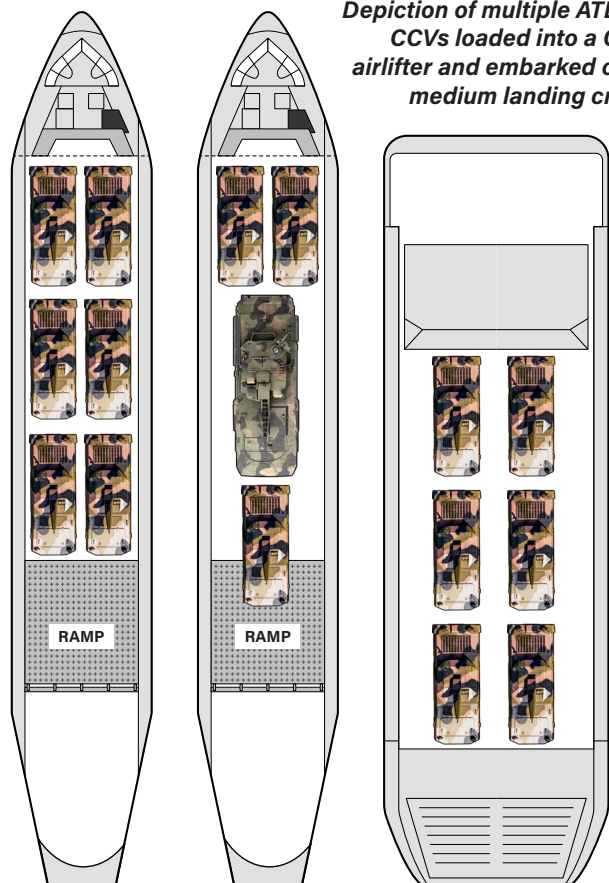
THE ATLAS CCV falls within the size and gross vehicle mass category that enables multiple vehicles to be easily transported and deployed by fixed-wing transport aircraft, on landing craft and as containerised loads.

For airtransportability, six ATLAS CCVs can be carried inside a C-17A Globemaster III airlifter without utilising the ramp. This enables rapid insertion of multiple combat-capable UGVs to secure an airstrip and act as an early-entry or blocking force.

As part of a manned-unmanned vehicle team, a single C-17 can carry one Boxer CRV supported by three ATLAS CCVs, delivering a highly mobile, lethal and flexible force in a single load.

The ATLAS CCV can also be transported via amphibious watercraft of various types and sizes, with a typical 50m medium landing craft able to embark at least six vehicles. This enables ATLAS CCVs to be landed across a beach as part of littoral manoeuvre operations in numbers aligned with the timely build-up of combat power ashore and high operational tempo.

Additionally, the ATLAS CCV is designed to fit within the confines of a 20ft ISO container and flat-rack, facilitating seamless and efficient deployment over strategic distances by sea, road or rail and where force composition discretion or concealment is desired.



*Depiction of multiple ATLAS CCVs loaded into a C-17 airlifter and embarked on a medium landing craft.*

## UGVs IN COMBAT

The modern land combat landscape has seen the emergence of innumerable unmanned systems, from first person view drones and loitering munitions to UGVs of various shapes, sizes and types, the latter designed for roles that include resupply, reconnaissance and assault.

Whilst airborne drones and loitering munitions have proliferated in operations such as those that continue in Ukraine, UGVs are yet to find the same level of widespread adoption and employment.

The challenge of operating on land is a persistent entry barrier for many UGV designs, where broken ground, myriad obstacles, dense undergrowth and low-traction/soft terrain present constant hurdles. Loss of communication links and command and control are also problems that must be overcome if UGVs are to become commonplace in the inventories of the world's armies.

The ATLAS CCV is able to meet the challenges of land operations by virtue of its proven high-mobility running gear, immensely capable and military-off-the shelf powertrain



and physical dimensions. These attributes – which include large off-road tyres, all-wheel steering, 8-wheel drive and a 10-tonne mass – help the vehicle 'muscle' its way through appalling terrain conditions, dense scrub and close country and over or through obstacles, thereby ensuring task continuation.

BAE Systems Australia's mature autonomy, sensor and command and control suite, which effectively acts as the eyes and brain of the ATLAS CCV, also maximises battlefield persistence and overall mission success.

## ATLAS CCV

## CONCEPT OF EMPLOYMENT

AS A PURPOSE-BUILT fighting platform, the ATLAS CCV is capable of performing a wide range of combat and combat-support roles that can supplement a traditional main force effort where increased lethality, coverage and battlefield flexibility are sought. Alternatively, it can undertake missions in a stand-alone capacity where the presence of an uncrewed platform is preferred over crewed vehicles.

The combination of a proven high-mobility, high-agility chassis and running gear, low-profile Vantage ATS 25mm gun turret and leading-edge autonomy, navigation and command and control systems enables the ATLAS CCV to accompany other combat vehicles on the battlefield and contribute meaningfully to mission success in whichever role it is tasked to fulfil, all using the same base vehicle.

## COMBAT WINGMAN

Of compact size and with significant organic firepower, the ATLAS CCV is an ideal 'battlefield buddy' for crewed combat vehicles. High mobility enables the ATLAS CCV to maintain contact with both tracked and wheeled crewed combat vehicles across difficult terrain and in all weather and environmental conditions.

In its role as 'combat wingman' for a crewed vehicle/manoeuvre force, the ATLAS CCV is able to undertake flank security, target identification and engagement, combat reconnaissance and direct fire.



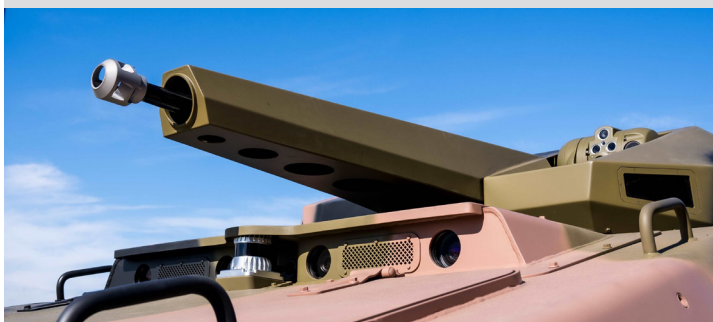
Artist's impression

## ASSAULT

In prosecuting an assault on a target, the M242 Bushmaster 25mm cannon integrated with the Vantage ATS provides accurate and highly lethal fire out to a range of 2,500m. Provided with a dual ammunition feed system, the 25mm gun arming the Vantage ATS turret is the most combat-proven medium-calibre weapon in the Western world and can successfully destroy all vehicle targets up to and including infantry fighting vehicles. A ready-use ammunition capacity of 260 rounds allows for multiple engagements and high battlefield persistence.

In addition to the fully-stabilised 25mm gun, the 10-tonne combat weight and rugged suspension system of the ATLAS CCV provides for a stable firing platform for the consistent delivery of accurate fire.

Due to its modular design, the ATLAS CCV can fulfill a wide range specific combat roles, including C-UAV and indirect fire support using a 120mm automated mortar system.



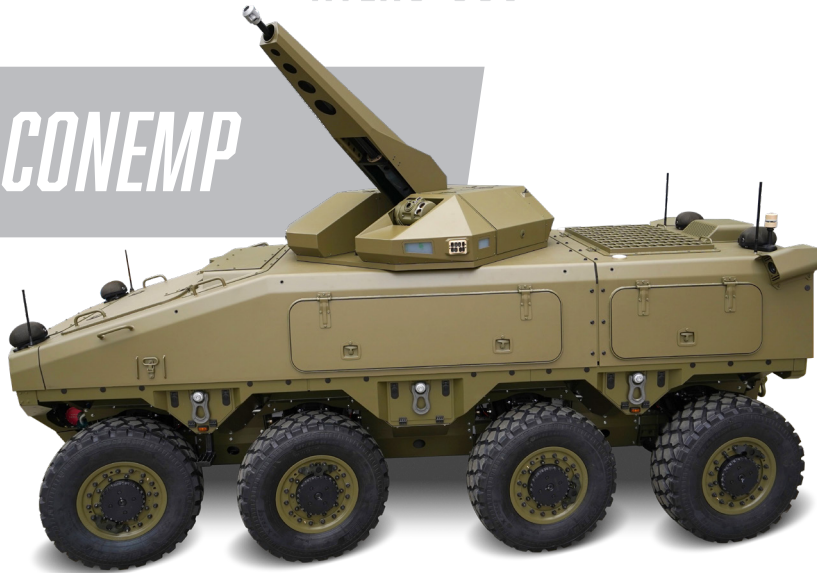
## RECONNAISSANCE &amp; SURVEILLANCE

Employing its advanced sensor suite – which is fitted as standard equipment and comprises a multi-spectral automatic target detection, tracking and classification system – the ATLAS CCV is able to act as the eyes and ears of a main force, either by being sent forward to carry out reconnaissance and surveillance or as a leave-in-place 'sentry' that can detect and track threats and hand these off to other combat assets. Alternatively, the ATLAS CCV is perfectly able to engage and neutralise detected targets itself out to 2,500m using its 25mm gun.

Operating in reconnaissance/surveillance mode, other specific roles which ATLAS is able to undertake include overwatch and electronic surveillance.



# ATLAS CCV CONEMP



## PRIMARY ROLES

### COMBAT WINGMAN

FLANK SECURITY

TARGET IDENTIFICATION & ENGAGEMENT

COMBAT RECONNAISSANCE

DIRECT FIRE

### ASSAULT

DIRECT ACTION

FIRE SUPPORT TO 2500m



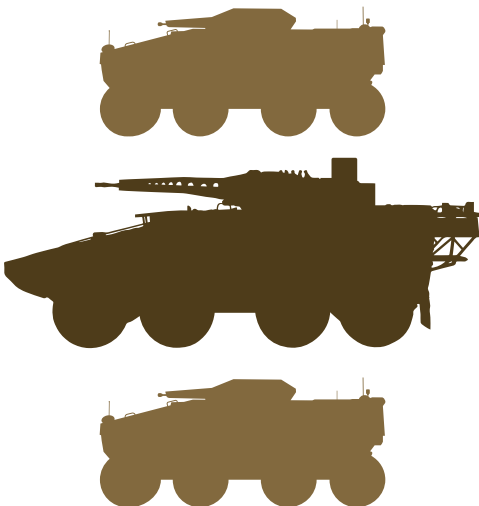
### RECONNAISSANCE & SURVEILLANCE

OVERWATCH

ELECTRONIC SURVEILLANCE

TARGET DETECTION & TRACKING

TARGET ENGAGEMENT TO 2500m



# TECHNOLOGY & DESIGN

A POTENT COMBINATION of proven MOTS sub-systems and leading-edge autonomy, sensors and design work in unison to deliver the mobility, firepower and intelligence of the ATLAS CCV.

MOTS components have been selected for their proven performance, reliability and low technical risk, while the bespoke technology developed by BAE Systems and its partners, including Supacat in the UK and Australia and Valhalla Turrets in Slovenia, has been incorporated into the design and provides a step-change in capability over other combat UGVs.

This approach to engineering design underpins the battlefield effectiveness, high lethality and multi-mission utility of the ATLAS CCV.

## SENSORS

- 360° multi-spectral automatic target detection, tracking and classification
- Day camera/thermal imaging/acoustic/passive electronic warfare/stereo vision
- LiDAR
- Capable of development for C-UAV engagements

## SURVIVABILITY

- Tailored protection depending on customer need to reduce overall vehicle mass
- Major sub-systems protected, including autonomy technology and ammunition stowage
- Axle lift capability to maintain mobility

## POWERPACK

- Powerpack has high commonality with Supacat HMT range of tactical vehicles
- Cummins ISB 6-cylinder 6.7ltr diesel engine as in Supacat HMT
- Allison 3000 automatic transmission

## DRIVELINE

- Supacat driveline with high commonality with HMT vehicle family

## TURRET

- 25mm automated medium calibre turret
- Purpose-designed to be as low-profile as possible to minimise vehicle exposure and contain overall dimensions.
- Optimised for UGVs and crewed/uncrewed platforms
- 260 ready-use rounds

## RUNNING GEAR

- 8-wheel drive
- Central tyre inflation system & run-flat inserts
- Reduced maintenance burden compared to tracked UGV competition







## AUTONOMOUS MODES OF OPERATION

- Tele-operation
- 'Follow Me' with obstacle avoidance
- Waypoint navigation with obstacle avoidance
- Goal-based mission planning

## ARMAMENT

- M242 Bushmaster 25mm cannon as used in LAV family, Bradley IFV and naval mounts
- High elevation (+70°)
- Potential for adaptive re-use of existing cannon stock
- Reduced cost of ownership
- Proven supply chain

## COMMAND & CONTROL

- Low probability of intercept communications
- Design supports manned-unmanned teaming
- Human on the loop for vehicle and turret operation
- Human in the loop for weapon engagement

## STORAGE

- Up to several tonnes residual payload potential inside the protected hull
- Designed to carry first line resupply for companion crewed platforms, including ammunition, fuel, rations, water and mission critical equipment

## AGILITY

- All axle steering
- Crab-walk steering capability
- Adjustable suspension and ride height
- Turning circle <13m

## MOBILITY

- Matched to on/off-road mobility of MBT, IFV, CRV and logistics trucks
- 2m gap crossing
- 1m vertical step
- 60° slope, 30° side slope

## VEHICLE & PAYLOAD CONTROL

- Vehicle Management System
- Mission Management System
- Payload Management System

# THE BRAINS BEHIND ATLAS CCV

THE ATLAS CCV Autonomy System is provided by the BAE Systems Australia autonomous uncrewed systems architecture, a specific instantiation of a common framework that has been in development for over 20 years in the air, land, and maritime domains.

The Autonomy System is the core of the ATLAS CCV; this system represents the platform 'driver', as well as a spatial and temporal planner and tactical decision maker.

The ATLAS CCS Autonomy System is capable of uncrewed dynamic vehicle behaviours such as accepting real-time control from a user (akin to remote control), autonomous geometric path following (a string of waypoints defining a path the vehicle follows) and path generation to avoid obstacles and navigate complex environments such as bushland.

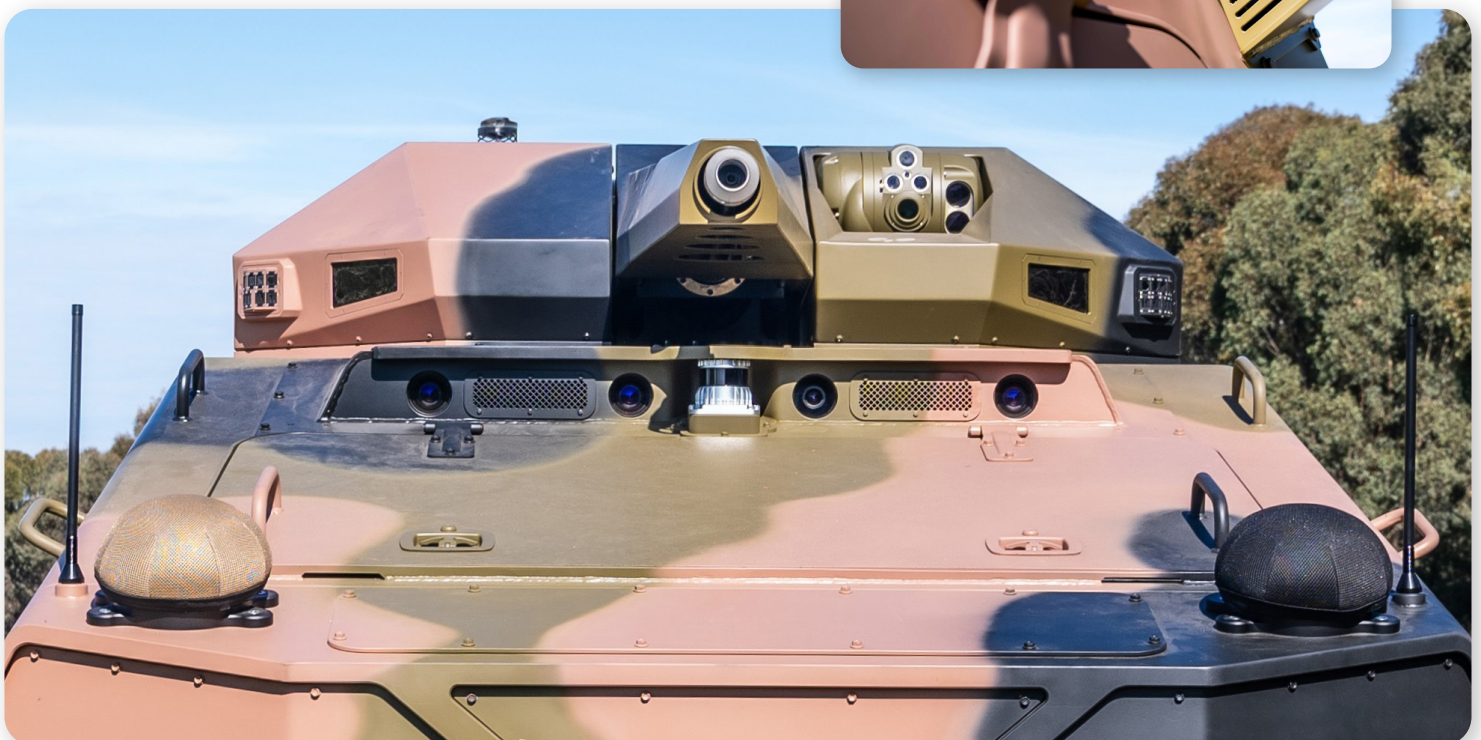
The ATLAS CCV incorporates an advanced sensor suite integrated with the Autonomy System to enable vehicle self and situational awareness. It is able to identify, classify and understand the complex real world environment in real-time and formulate appropriate responses to execute its mission.

The ATLAS CCV Autonomy System can use these features in a combined fashion to achieve goal-based autonomy for a particular mission context, such as beyond-line-of-sight reconnaissance. The ability of the Autonomy System to plan and disseminate tasks to achieve a goal is designed around reduced cognitive burden for an operator, who may be responsible for many vehicles.

Effective and secure communication between users and other assets – be it crewed or uncrewed – is a core aspect of the Autonomy System. This allows teaming and formations based on common mission datasets and allows effects to be combined and multiplied.

The Mission Module of the ATLAS CCV is highly customisable and interchangeable for a particular mission and payload. The Autonomy System is configurable through its architecture to the suite of potential Mission Modules, and allows for open expansion of Mission Module use cases throughout the ATLAS CCV life-cycle.

**BELOW: The vehicle management and mission management systems are at the heart of the ATLAS CCV's autonomy, command, control and communications.**



# TACTICAL RESUPPLY

IN ADDITION TO its primary role as a weaponised platform, the ATLAS CCV can also play a part in the logistics resupply of deployed elements operating on or close to the forward edge of battle.

Inherent in the design of the ATLAS CCV central hull is internal volume that enables the stowage of supplies such as first line fuel, water, batteries and small arms and medium calibre ammunition. This space is accessed via large rectangular doors that hinge upwards to permit the manual loading and unloading of supplies. Specific fuel pods can be purpose-designed into the hull to facilitate refuelling in the field of companion vehicles, such as MBTs, IFVs and CRVs.

Specific envisioned loads include diesel fuel in conformal tanks, jerrycans for both potable water and fuel and ammunition cans for 7.62/12.7/40mm direct fire support weapons and 25-30mm cannon. Medical supplies and mission essential equipment can also be carried.

Protected against small arms fire and possessing exceptional cross-country mobility, the ATLAS CCV could be sent forward into the direct fire zone to provide logistics relief to small units that have run critically low on fuel, water, rations or ammunition.

The epitome of using robotic and autonomous systems to perform tasks considered too dangerous for people, the secondary resupply function positions ATLAS CCV as a dual-role platform, thereby maximising both its battlefield utility and cost-effectiveness. **DTR**

**BELOW:** The centre stowage area is accessed on each side by a large access door and a large access hatch on the front glacis plate.





Innovation beyond boundaries

## Autonomous solutions to navigate any domain

Leveraging technical advantage is critical in a rapidly evolving multi-domain battlespace, where decision-makers seek an asymmetric edge.

Autonomous systems play a key role in that connected, information-rich landscape. Agile and affordable platforms deliver capability in an environment where sensing, deception and strike are critical requirements. They can also enhance the operational effect of crewed platforms by augmenting the force mix through affordable combat power.

Working with partners including the Australian Army, BAE Systems Australia is investing heavily in sovereign capability that drive autonomous systems. This ensures we can help our customers achieve mission success whilst protecting those who protect us.

[baesystems.com](http://baesystems.com)

**BAE SYSTEMS**