

## The HIPPO All Terrain Support Vehicle (ATSV)

### Light Forces

Light forces by their very nature have a high degree of strategic and operational mobility as they are capable of being deployed rapidly into and within theatres by air and aviation assets. This provides not only a rapid theatre intervention capability to deal with emerging threats, but also the ability to achieve operational and tactical surprise.



Fig 1: Aviation insertion by CH-47



Fig 2: Airborne insertion by C-130

Images contain public sector information licensed under the UK Open Government Licence v3.0

Light forces are optimised for complex terrain such as jungles, mountains and the dense urban environment where the terrain prevents the deployment of armoured and mechanised platforms or speed necessitates the rapid deployment of forces by air.



Fig 3: Jungle operations

Image contains public sector information licensed under the UK Open Government Licence v3.0

However, light forces are limited in their tactical agility and operational endurance by the quantity of equipment and combat supplies that they can physically carry.



## Burden on the soldier

In 1950 SLA Marshal published “The Soldier’s Load and the Mobility of a Nation.” He concluded that a soldier should carry no more than 1/3 of their body weight. UK research in the early 2000s in support of the Future Integrated Soldier Technology (FIST) project and the Platoon Combat Experiment 2013-15 reached similar conclusions. For the average infantry soldier that is a load of no more than 24 kg.

The British Army has instigated a policy of “Fight Light” to minimise the amount of equipment carried. However, even under “Fight Light” the current assault load is more than 33 kg.

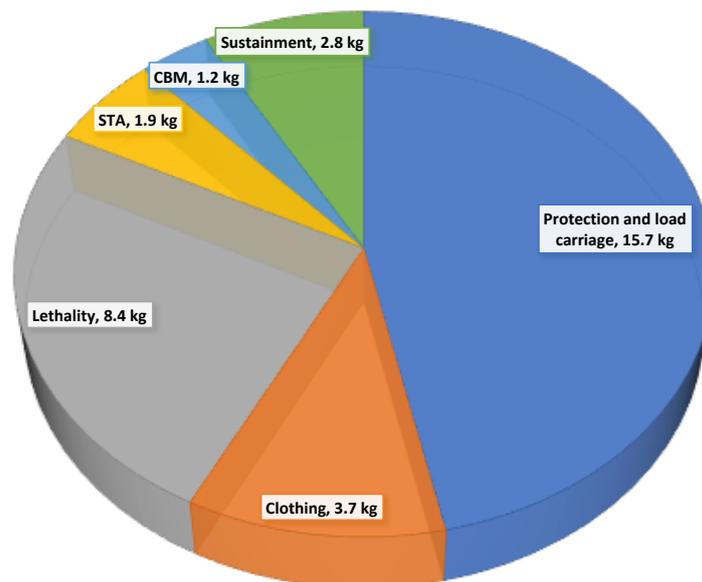


Fig 4: “Fight Light” assault load

Furthermore, in order to get into an assault position, soldiers are required to carry other equipment such as rations and water, spare ammunition, entrenching tools, anti-armour weapons, radios, electronic counter measures, mortar ammunition, 40mm grenades, machine gun ammunition etc. Distributing this combat load across a 29-strong platoon sees an additional 27 kg of load on top of the 33 kg of assault load – a staggering 60 kg. No wonder that musculoskeletal injuries are so prevalent among infantry soldiers.



## The HIPPO ATSV

The HIPPO ATSV addresses the challenges for light forces in three ways:

- Load carriage.
- Mobility.
- Power generation.

### Load Carriage

The HIPPO ATSV can carry a driver, passenger and 750 kg of cargo on the back decks of the vehicle. This is sufficient to allow a dismounted rifle platoon to operate unburdened in assault order for up to 72 hours.



*Fig 5: HIPPO ATSV with crew and 750 kg of cargo*

At the 2017 UK Army Warfighting Experiment (AWE) the HIPPO ATSV showed that it had the payload to carry an entire rifle platoon's daysacks, spare ammunition and other supplies.

The addition of a trailer gives a further 1500 kg of cargo capacity – sufficient for 3 x 81 mm mortars and 312 x 81 mm bombs.



*Fig 6: Prototype Mk 1 HIPPO and trailer carrying mortars and ammunition*



### Mobility

The HIPPO ATSV can be rapidly deployed by air and aviation assets – it is air droppable by parachute and can be internally transported by support helicopter such as CH-47, CH-53 and AW101 MERLIN. It can be underslung by utility helicopters such as UH-60. The HIPPO ATSV has superb cross-country performance and it is amphibious.



*Fig 7: The HIPPO ATSV negotiating a water obstacle in heavily wooded terrain*

The addition of a track kit (user installed over the wheels) means that the HIPPO-X can negotiate deep snow – making it an ideal all year platform for mountain troops.

### Power Generation

The last decade has seen an exponential growth in the number of electronic devices carried by dismounted soldiers – radios, ECM, GPS, night vision, situational awareness. While each piece of technology assists the soldier in their duties it comes at a price – weight. It also places a burden on the resupply chain.

The HIPPO ATSV can generate 5 kW of electrical power. This allows it to constantly run battery charging which reduces the number of batteries required to be carried by individual soldiers and reduces the burden on the resupply chain. The stress on the resupply chain can be further reduced by the HIPPO ATSV's ability to run a water purification unit which reduces the demand for water from the rear. The 24V electrical supply is sufficient to operate other electrical equipment eg command post radios, mast mounted surveillance equipment, a tethered UAS for surveillance and/or radio rebroadcast, electronic counter measures, a water heater for hot drinks and food, remote weapon station, etc.

A high capacity Lithium Ion battery in the hull of the vehicle allows electrical demand to be met during silent watch.

The HIPPO ATSV is also capable of exporting hydraulic power for light engineering applications.



## Robotics and Autonomous Systems

The HIPPO ATSV is “drive by wire.” This enables the vehicle to be fitted with an applique kit for Robotics and Autonomous Systems (RAS) applications. The HIPPO ATSV has already been demonstrated to the UK Defence Science and Technology Laboratory (DSTL) with an autonomy kit fitted as part of the Autonomous Last Mile Resupply (ALMR) project. Future RAS applications could include a surveillance and reconnaissance package, a remote weapon station, a route proving capability, communications rebroadcast.

## Summary

The HIPPO ATSV allows light forces to deliver tactical overmatch through its:

- Load carriage
- Mobility
- Power generation



Fig 8: HIPPO ATSV

## Contact

For more information contact:

Rob O'Connor; [rob@pardus.co.com](mailto:rob@pardus.co.com)

