

# T-Series Heavy Lift Electric UAS

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MALLOY AERONAUTICS

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# Malloy Aeronautics T-Series

The T-Series, designed by Malloy Aeronautics, are all-electric heavy lift uncrewed aircraft systems (UAS) that deliver rapid response solutions to a wide range of applications. Limited training requirements paired with low operating and maintenance costs provide a cost effective, sustainable alternative to traditional systems.

Class-leading payloads from 68kg (T-150) through to 300kg (T-650) create an opportunity for new and disruptive mission types. Runway independent, paired with a compact footprint ensure the T-Series range can fulfil a variety of use cases such as logistics, weapons release and casualty evacuation (CASEVAC) in all circumstances no matter the conditions.

With zero carbon emissions at the point of use, Malloy Aeronautics has designed the T-Series to revolutionise military operations especially where there is a requirement to carry heavy loads. This helps to keep military personnel out of harm's way in dangerous situations or disaster zones, whilst providing a low environmental footprint.

With a strong pedigree in complex systems integration and delivery, BAE Systems and Malloy Aeronautics are developing enhanced, assured military capabilities for the T-Series. This includes the introduction of advanced mission planning and management systems, autonomous system capabilities, and sophisticated weapon and payload development and integration.

# Malloy Aeronautics T-Series

Introduction of products



## T-150

Providing the ability to reliably lift 68kg in all weather conditions, the T-150 UAS is a trusted partner. With a removable battery, the T-150 UAS is mission ready by design and there is no need to wait hours to send a vehicle back out, increasing cargo cadence and value for money.

Capable of delivering time sensitive and high value cargo, the T-150 UAS has been designed for the toughest military environments, demonstrated operationally in the arctic circle, desert and at sea.

The T-150 is a best in class, all-electric UAS that delivers operational excellence and is recognised by militaries across the globe as a leading logistics drone.

## T-400

Lifting 180kg under the harshest of conditions, the T-400 provides an ability to deliver heavy and difficult payloads anytime, anywhere. Removable batteries easily lifted by personnel, alleviates the waiting for a battery to recharge, increasing cargo cadence and value.

For a vehicle of its size the T-400 is incredibly easy to operate and is able to carry out complex tasks, with low burden of complexity to the user. Operated effectively through sense and avoid and autoland systems, the easy-to-implement architecture of the T-400 optimises system usage, whilst reducing time integrating sensors and payload.

The T-400 is a step up in size from the T-150 but retains the class-leading characteristics that make the T-150 so heavily utilised around the world. Commonality across the T-Series fleet allows for low training burden and an easy ability to broaden the envelope for operational use.







## T-600

Originally designed as a demonstrator aircraft, capable of vertical take-off and landing (VTOL), carriage of payloads up to 200kg and speeds of over 125km/h, the T-600 has rapidly evolved into much more than a flying test bed. With its range of up to 55km, depending on payload, combined with a design which allows for easy disassembly for transportation, the T-600 has become a sought after capability by customers.

The T-600 recently completed a large NATO exercise in Portugal to integrate the very latest maritime technologies across allied forces. During the multinational Robotic Experimentation and Prototyping using Maritime Uncrewed Systems exercise known as REPMUS, the T-600 successfully demonstrated the carriage and release of an inert Sting Ray Training Variant Torpedo.

As well as current operational applicability, the T-600 was designed to develop, validate and display technologies which may be applied to the T-650, a completely new design of an all-electric heavy lift UAS. Offering rapid reconfiguration capabilities applicable to military, commercial and humanitarian uses.

## T-650

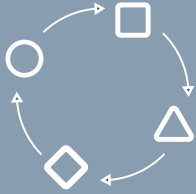
As the world's heaviest-lifting all-electric VTOL UAS, the T-650 will deliver class-leading 300kg payload capacity and benefits from a number of advantages resulting from its VTOL configuration. It is runway independent with a beyond visual line of sight (BVLOS) capability, enabling it to operate from hard to reach locations which are inaccessible by most alternative forms of aircraft or ground vehicle.

It is specifically designed with a diverse range of applications in mind, including ship-to-ship and ship-to-land movements, making it a leading candidate for both land and sea-based logistics operations. A simple design, with only limited moving parts, provides value to customers through significantly reduced maintenance and operating costs when compared to traditional rotary wing aircraft.

The T-650 will be developed to operate either as a stand-alone asset, or integrated across multi-domain systems with other assets across the fleet offering further opportunities to streamline operations.



# Benefits



Multi-role  
reconfigurable platform



Class leading  
payload capacity



Low operating &  
maintenance costs



Integrable with  
third party systems



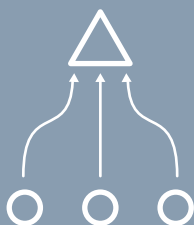
Secure  
interoperability



# Benefits



All-electric: Zero emissions  
at point of use



Commonality  
across the fleet



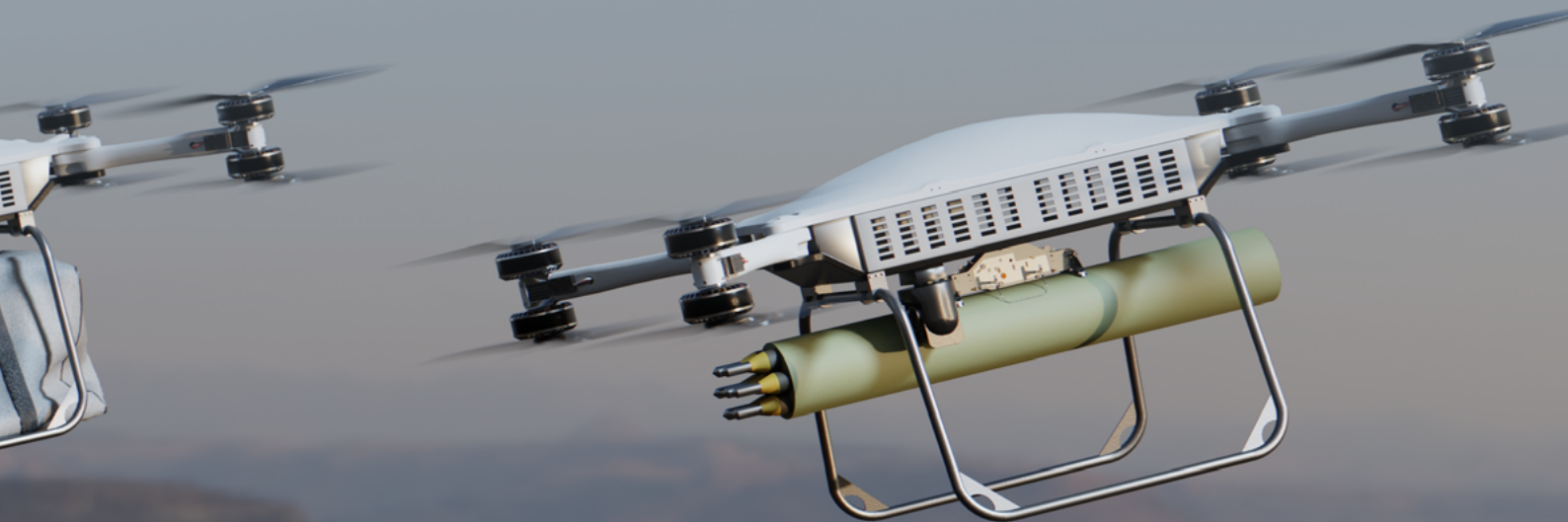
Low turnaround  
time



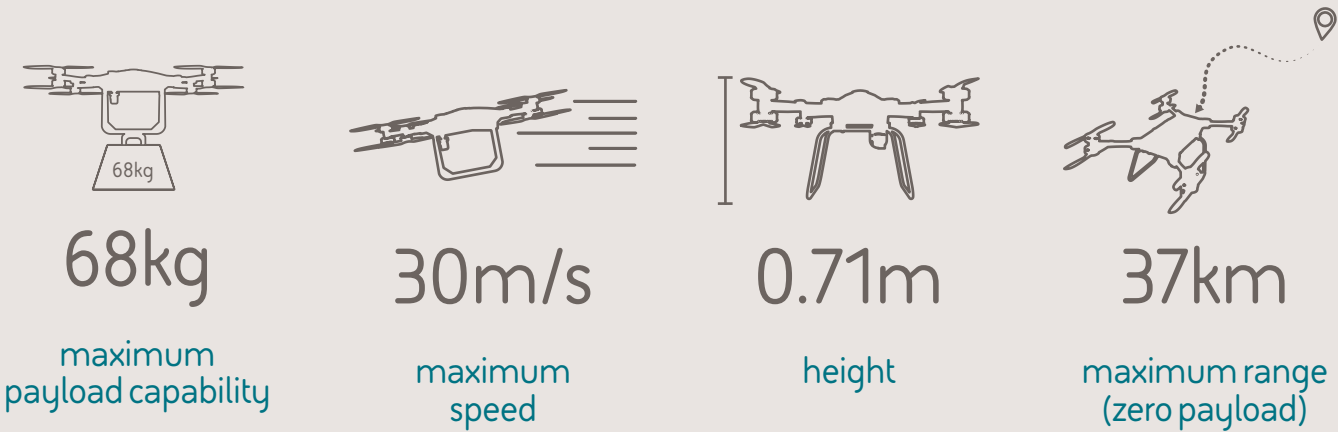
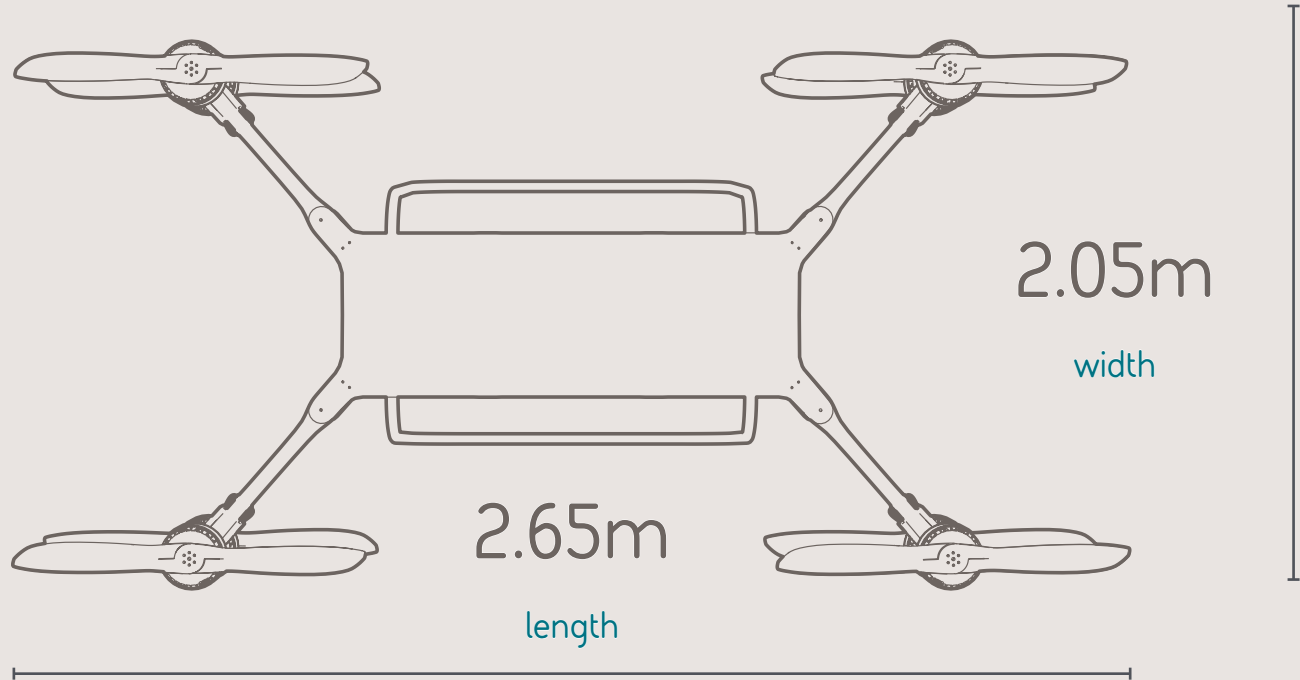
Runway independent  
operation



Limited training  
required

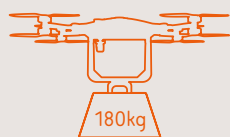
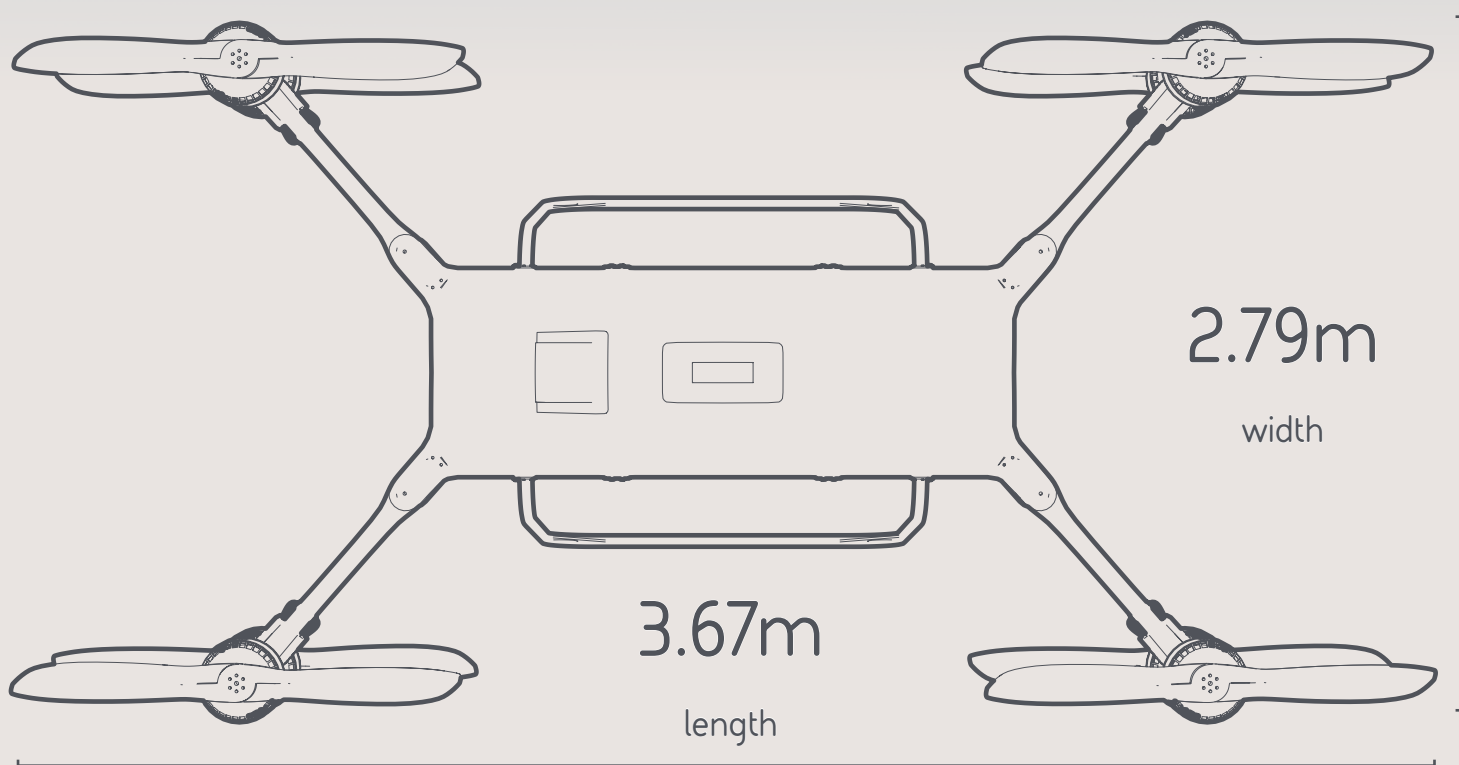


# T-150





# T-400



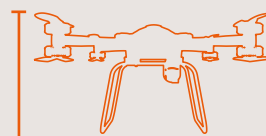
180kg

maximum  
payload capability



40m/s

maximum  
speed



1.14m

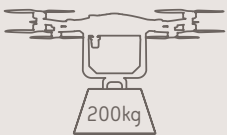
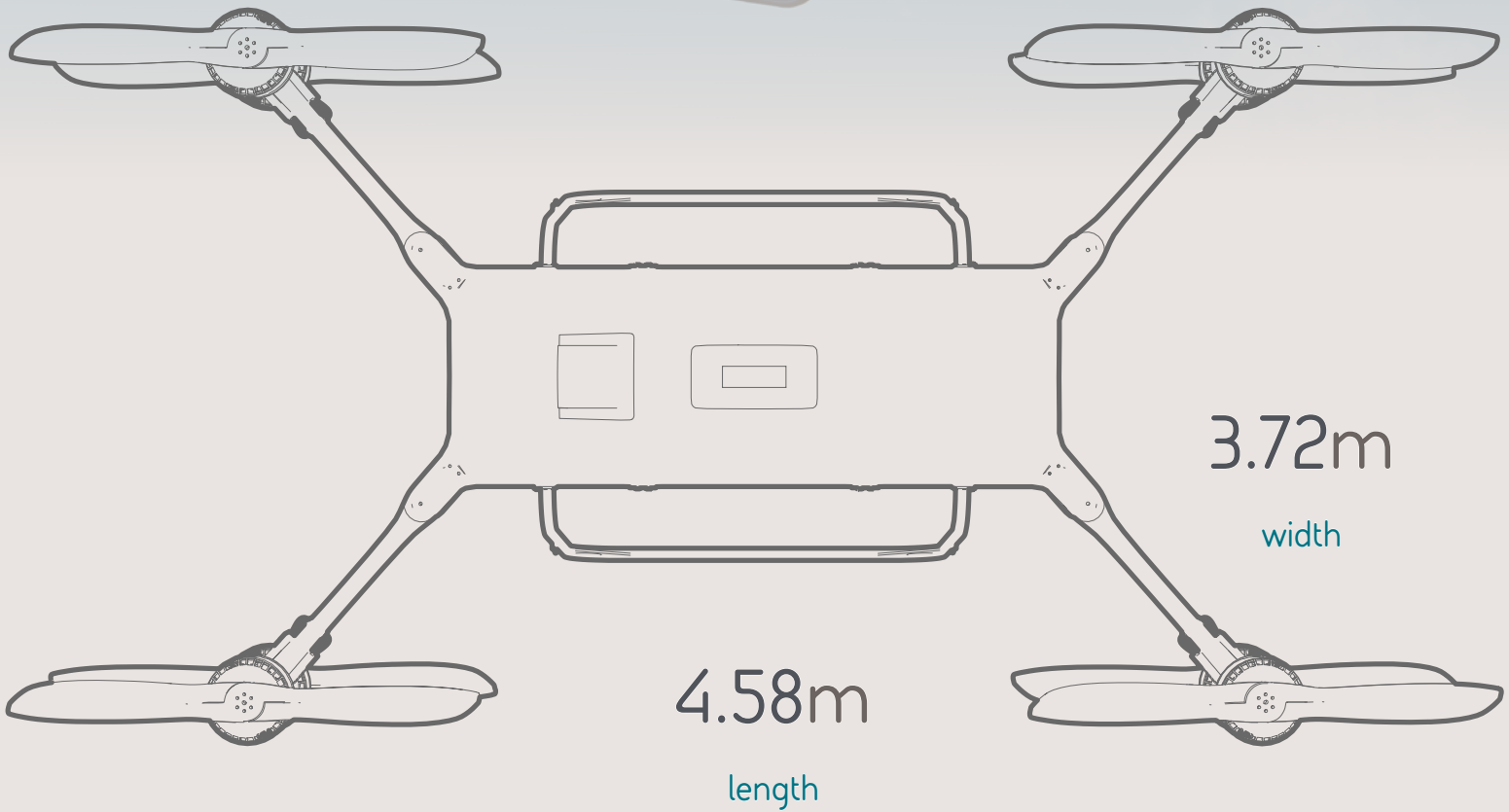
height



50km

maximum range  
(zero payload)

# T-600



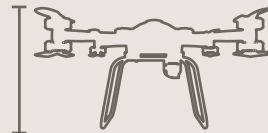
200kg

maximum  
payload capability



35m/s

maximum  
speed



1.17m

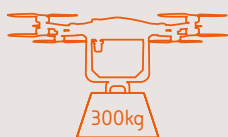
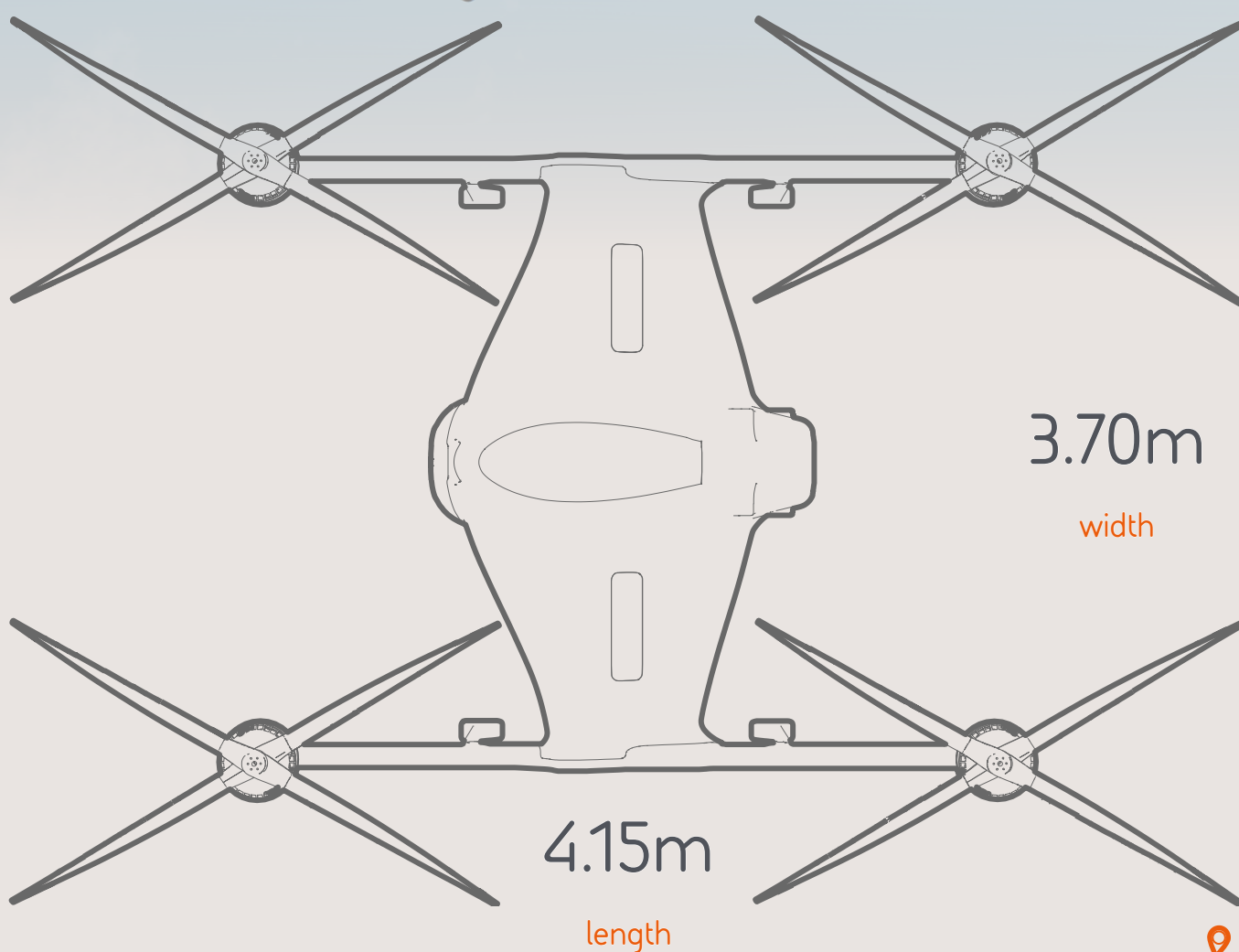
height



55km

maximum range  
(zero payload)

# T-650



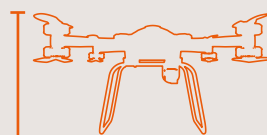
300kg

maximum  
payload capability



40m/s

maximum  
speed



1.08m

height



30km

maximum range  
(maximum payload)

# T-Series Capability

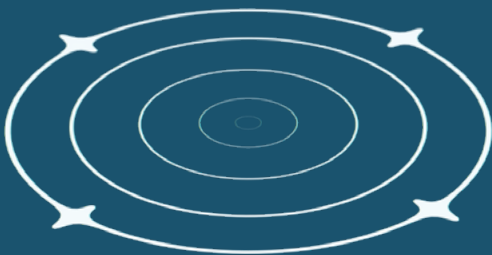
## Core Features

- Vertical take-off and landing (VTOL)
- Multi-role capability
- Removable hot-swappable rechargeable batteries
- Remote payload release capability
- Open architecture system
- Weatherproof design
- Customised transportation media
- ITAR free design
- Blood and medical goods transportation capability
- 1-2 person operation dependent on mission



## Options

- Precision autonomous landing
- Anti-GPS jamming capability
- On-board mission computer
- Bespoke advanced mission planning system
- Configuration for sea operations
- Customised payload integration
- Integration with other military systems





## Pedigree

- In service with multiple armed forces
- Extensively tested by the US and UK military
- Tested in extreme hot and cold (-21.6 degrees Celsius) temperatures
- Continuous improvement through testing and customer feedback
- Programme of record with US Marine Corps



# Use Cases

## One drone, many uses.

### Logistics

The T-Series is capable of conducting a range of logistics and re-supply missions across multiple domains in daytime or nighttime conditions. It provides operators with a reduction in the cost per flying hour and servicing over traditional crewed rotary wing craft. Furthermore, the ability for uncrewed operation in both land and maritime domains reduces the dangers of flying crewed aircraft in contested airspace or in hazardous environments such as in high sea states or in mountainous regions.

Due to the lower cost compared to larger rotary wing craft, the T-Series can be equipped to smaller military

formations, facilitating greater mission flexibility. Its simple design with only limited moving parts, also reduces maintenance requirements, lowering the personnel footprint on operations.

With autonomous capabilities, the T-Series can support automated logistics and re-supply missions with minimum personnel and maximum capacity. The T-Series is designed to be easily reconfigured with different payloads, enabling it to be readily adapted to support different mission types.



### CASEVAC

Development of a CASEVAC system will enable the short range transfer of a casualty out of immediate danger and to the next line of care. The CASEVAC capability allows for casualties that are in immediate danger to be extracted without risking crewed aircraft in hazardous environments.

The smaller footprint of the T-650 will enable it to manoeuvre closer to the casualty and require a significantly smaller landing area. Utilising a UAS for CASEVAC reduces the burden on other expensive crewed assets, releasing them for other critical missions and lowering operational costs. The characteristics of the T-650 CASEVAC system allow for low profile extraction to prevent signposting the mission to adversaries.



## Anti-Submarine Warfare

Capability is being developed to enable the T-650 to deploy a lightweight torpedo, adding offensive anti-submarine warfare (ASW) capabilities to ships that do not have an organic ASW system or are too small to accommodate a helicopter.

Compared to traditional helicopter-based torpedo deployment, T-650 would provide faster mobilisation times with significantly lower operating costs and would release helicopters for other tasks.

T-650 offers the potential for teaming with other crewed or uncrewed platforms. With additional platforms available, the weapon train may be extended, keeping the threat engaged for longer or multiple torpedoes may be deployed.

A T-650 can also provide greater torpedo range than traditional tube launched systems on warships.

## Find to Strike

Development of capability to carry and launch air-to-surface missiles, including guided anti-armour missiles will give the T-Series capability to deliver an end-to-end find to strike capability.

Working either interdependently or collaboratively with an autonomous laser target designation capability offers the potential to change the way in which joint fire operations are currently carried out.

This system is a direct response to a clear and urgent need, confirmed by end users close to the operational challenges and current capability shortfalls. Where close air support is unavailable, target designation and release of precision

laser-guided munitions at a range beyond that of small arms fire is currently not feasible. In such circumstances, a T-Series UAS could provide the ability to rapidly deploy precision strikes in support of ground forces under attack.

By taking the requirement for crewed air assets out of the loop, the risk to aircrew and time to targeting and strike are reduced dramatically. This greatly enhances the ground forces' survivability by reducing the time it takes to get rounds on target as well as greatly increasing the probability for a first-round strike and disruption of enemy forces.





## Why BAE Systems

BAE Systems has a proud history of working closely with our customer and military partners. As a provider of military aircraft for over 100 years, we have continued to evolve our approach to support our customers achieve their operational goals. Best known for the delivery of complex military platforms, BAE Systems is also able to provide services such as: training (both aircrew and ground crew) and integrated support services including fleet planning / management, aircraft maintenance, supply chain management, engineering support (including technical queries and product upgrades) and overall service management for our customers globally. We work alongside numerous regional air, land and maritime forces to deliver cutting-edge

capabilities, including those from NATO and the Gulf Co-operation Council. We have a reputation for supporting our customers no matter what the challenge, maintaining our support operations for customers in times of tension and conflict, and more recently during the global pandemic. BAE Systems endeavours to tailor its solutions to meet the future needs of its customer.

We are bringing our extensive expertise in the design, engineering and systems integration of complex platforms together with industry leaders in electric aircraft to accelerate the pace of innovation to meet our defence customers' net zero ambitions.

FalconWorks® is the agile innovation powerhouse for the air sector. It is a world-leading future technology innovation hub that can continuously deliver breakthrough technologies at pace that keep our customers ahead.

FalconWorks® brings together talented people working with a clear vision and purpose – to do things differently and to think about not just what comes next, but what comes after next.

FalconWorks® is driving the development of sustainable electric solutions in the defence sector and parallel markets. The decision to pursue electric products stemmed from expressed customer interest, our standing commitment to sustainability and continued push to develop innovative products.





## Why Malloy Aeronautics

Malloy Aeronautics, a wholly owned subsidiary company of BAE Systems, manufacture the world's most advanced fleet of heavy lift VTOL logistics drones. Founded in 2013, the company has developed a range of last mile aerial logistics capabilities working in collaboration with the US Marines, Royal Navy, and Royal Marines. The company has signed a five year programme of record with the US Department of Defence, and has delivered multiple aircraft to the UKMOD.

Malloy Aeronautics' portfolio of aircraft provide a low cost, highly effective supply solution, across all domains, to remote and inaccessible locations, in support of peacetime operations, humanitarian relief and in contested areas. Its platforms are tailored to clients' requirements and can include a variety of cameras, sensors, communications equipment and GPS hardening options.

Malloy Aeronautics has a strong history of partnering, with both end users and industry collaborators, enabling it facilitate integration of third party assets and equipment, including novel capabilities developed with and for end users.

Its expanding operation has a broad range of design, manufacture and test capabilities. The company has a strong focus on innovation and is investing in the development of its own drive trains and electric motors to secure vertical integration. It is renowned for its agile development and rapid prototyping capabilities, supporting customers in developing and testing mission-specific airborne systems for the most extreme and demanding operations.

# Dave Holmes

MANAGING DIRECTOR, FALCONWORKS®

"Malloy's proven track record of innovative technology in this field, with our understanding of the military operating environment and extensive engineering and systems integration experience, is enabling us to develop a sustainable and cost-effective solution for both military and commercial customers."

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# Oriol Badia

CHIEF OPERATING OFFICER, MALLOY AERONAUTICS

"Beyond the military capabilities, there is also clear potential in the commercial, security and humanitarian arenas. Our goal is to ensure that our capabilities are not just the first and best for defence, but that they become the future workhorse to keep all our personnel safe."

MALLOY AERONAUTICS





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