A Revolutionary Unmanned Aerial System:
Setting the Course for Afghanistan and Beyond
K-MAX DEPLOYMENT

Since its first successful unmanned resupply mission in Dec. 2011, the K-MAX is logging successes daily, delivering critical supplies to U.S. troops and allies at bases and outposts scattered throughout Afghanistan.

Here are a few accomplishments the K-MAX has achieved since flying its first unmanned resupply mission.

Delivered 4M+ pounds of

- Food
- Water
- Fuel
- Batteries

Moved 30,000 pounds of those Supplies per day

Completed 1,700+ day and night resupply sorties

LOCKHEED MARTIN

lockheedmartin.com/kmax
K-MAX Impact

Naval Postgraduate School – Business Case Analysis of K-MAX:
- Study concluded: K-MAX is less costly than ground convoys
- “By leveraging this capability the Marine Corps is able to modify the overarching warfighting strategy from constrained and defined supply routes (ground) to an indefinite amount of resupply routes (air).”

April 2012 Ops Tempo = 100K lb / wk

<table>
<thead>
<tr>
<th></th>
<th>K-MAX</th>
<th>Ground Convoy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel Required</td>
<td>3</td>
<td>12-34</td>
</tr>
<tr>
<td>Marine Exposure Time</td>
<td>0 hrs</td>
<td>1,100 hrs</td>
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<tr>
<td>Critical Resupply Time</td>
<td>1 hr</td>
<td>10-17 hrs</td>
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K-MAX moved 4M lbs

4M lb Convoy Equivalent:
- 400 7-ton cargo trucks
- 400 security vehicles
- 41K hrs personnel exposure

Zero Marines Exposed to Improvised Explosive Devices
Cargo UAS Autonomy Efforts

Actively Addressing Need – Extending Current Capability
ATUAS Technology

Autonomous Technologies for Unmanned Air Systems (ATUAS)

- Autonomous Load Pick-up
- Multi-Vehicle Control
- STANAG 4586
- Interoperability Profiles (IOP)
- Onboard Intelligence & 3D Ground Collision Avoidance
- Improved Safety for Beyond Line of Sight Delivery
- Increased Beyond Line of Sight Bandwidth
- Improved Delivery Point Accuracy
- Improved Safety for Beyond Line of Sight Delivery
- Contingency Management

Technology Aligned with Navy/USMC Cargo UAS Program
K-MAX Future

- Optionally Piloted Vehicle
- Inherent Reliability for Heavy Lift Missions
- Built to Lift – 1:1 Lift Ratio

**Adaptability**
- Multi-Mission UAS – 24/7 Operations
- Reliable, Heavy Lift Airframe – 1.5 MMH/FH
- Minimal Deployment Footprint

**Innovative UAS**
- Robust / Redundant Unmanned Control
- Dual Dissimilar Communication Links
- Optionally Piloted – Accelerated Testing

**Life Saving Capability**
- Reduces threat of IEDs to Ground Convoys
- Augments Manned Aviation Assets

**UAS Missions**

**Cargo Resupply**
- Precision Delivery
- Unmanned Retrograde
- Multi-Drop Carousel

**Inherent Missions**
- Special Operations

**Future Capability**
- Maritime Operations
- Ship-to-Ship/Shore

- Humanitarian Assistance / Disaster Relief
- Forestry / Construction
- Intelligence, Surveillance, Reconnaissance