

**Dutch Space**

an EADS Astrium company

# SPADES

## Smart Parafoil Autonomous Delivery System 1000 Mk2 (2,200 lbs) '2K' System



### System description

SPADES is a reusable autonomously guided air delivery cargo system and is intended for use by military personnel when delivering cargo safely and accurately in support of civilian and re-supply missions or direct support of tactical operations. The SPADES 1000 ("2K") system is designed to provide accurate, low-risk airdrops with payloads ranging from 100 to 1,000 kg (200 – 2,200 lbs) with the same high level of accuracy throughout the payload range. In addition, the system is designed for portability, ease of operations, ruggedness, and simple maintenance procedures to lower costs, reduce training time, and maximize operational effectiveness.

Since the year 2001, SPADES systems have participated in over 300 test drops and with a 50m Circular Error Probability (CEP) capability, they are ideal for supporting tactical missions or logistic operations where accuracy is a key to success. SPADES can be used with standard military riggings and compatible with a number of different parafoil types, basically to be applied at operator's choice.

### Unique 'Box & Frame' concept

The SPADES 1000 airborne guidance unit (AGU) weighs only 34 kg (75 lbs) including two removable battery packs. The system is supported by an external protective frame for parachute and payload attachment, and for protection against severe unintended impacts. The unique 'box & frame' concept allows for ease throughout the rigging process. The payload, frame and parachute can be pre-rigged completely, enabling AGU insertion/exchange



up to the last minute before drop. Once on ground, the AGU can be rapidly removed for man-carried recovery from the landing zone. In fielded situations, frame and batteries can be disposed of if necessary, with low cost consequences for replacement.

Optionally, the protective frame can be delivered with telemetry equipment for 2-way communications between system and operating personnel. This feature can be used for all kinds of testing purposes and remote control during flight.

### Ease of Operations

The SPADES feature of real-time wind detection eliminates the need for gathering wind data before the air drop and consequently does not require an additional fly-by to make actual wind measurements prior to the drop. For mission planning no other wind information is needed than what is available from open sources and used for standard manned flight mission planning. Minutes before drop-off, changes in target locations and waypoints can be entered. The independent SPADES mission planner

software can handle up to 15 drops at the same time, each having its individual mission profile. The mission planner software can be installed on any commercial laptop pc. SPADES is also fully compatible with the JPADS mission planner.

The system is easily checked for operational performance before loading and on-board the aircraft through a built-in test that visually identifies a ready or failed status. The quick-link steering line connections are easily accessible for attachment/detachment within 1 minute without having to open the AGU.

### Ruggedness

Results accumulated from the demonstration and test drops show that the design is rugged and capable of consistently performing in harsh conditions. The external structure and stiffened skin of the AGU protects the components inside, allowing for high shocks both at impact and during transport.

### Accessibility & Maintainability

The system has a modular design and enables easy access to all major components / line replaceable units (LRUs). Standard tooling is used to assemble/ disassemble all components, which can all be replaced within two hours. Maintenance and repair procedures are therefore simple and fast which lowers cost, reduces training time, and improves system availability. SPADES 1000 can be used at least up to 50 times without major overhaul

### Customer support

SPADES is ready to provide logistic and maintenance support in the domestic area of our customers by utilizing our world-wide EADS network and other liaised specialist companies.

### Airworthiness

The SPADES 1000 is in the process of being certified against military airworthiness requirements. This will qualify the system for safe operation over populated areas, enabling missions in a large variety of areas and circumstances.



*SPADES 1000 AGU insertion in rigged configuration*



*SPADES 1000 AGU (right) and protective frame with pre-rigged parachute*

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