



MICRO ELECTRIC ROTARY WING UAS

SPYBALL-B is a ducted fan, electrically powered Micro Unmanned Aerial System (MUAS) designed to assist front line troops with the detection of potential threats and targets. It features a Vertical Take-off and Landing (VTOL) system specifically designed for “hover and stare” and intelligence missions at platoon level. Thanks to its lightweight construction, SPYBALL-B can be carried and operated directly from an advanced reconnaissance unit.

Typical applications

- IED/EOD location and identification
- Target acquisition
- Short range/over-the-hill surveillance and monitoring
- Battlement assessments
- Border protection
- Crowd control
- Hostage and siege situations
- Strategic intersection/crossroads surveillance
- Infrastructure monitoring and surveillance

SPYBALL-B has a maximum takeoff weight (MTOW) of 2kg, an endurance of 25 minutes and a link range of 5Km LOS. It is homologated and certified according to Italian Law AER.P-2 by the Italian General Air Force Armament Authority:

- STANAG 4703 (Edition 1) as certification base, adapted for ducted fan vehicles
- Pilot Program for the application and implementation of STANAG 4703 standard in NATO countries

The Command & Control Software was developed and certified according to standard rule RTCA DO-178B: certification released as DAL (Development Assurance Level) at B level. SPYBALL-B can be operated in automatic or semi-automatic modes. An automatic obstacle avoidance feature (programmed via the MUAS common Ground Command & Control Station) enables the platform to track along narrow paths. It is supplied with a standard stabilised gimbal with EO and/or IR cameras optionally supplied with laser range finder. The camera can be controlled independently of the platform, at any time during the flight.

- In its standard configuration, a SPYBALL-B system (comprising three airframes) is supplied with:
- x2 Day/Night pan & tilt gimbal modules
 - x1 infra-red/thermal pan & tilt gimbal module
 - 1 Man portable Ground Command & Control Station (GCCS)
 - Ancillary maintenance devices
 - Spare parts kit

SPYBALL-B



Different configuration and system mixes can be supplied according to specific requirements.

FEATURES AND CAPABILITIES

- Unique hovering and remote recovery
- One-man operation
- Obstacle avoidance
- P/Y GPS (SAASM) module (optional)
- All electric propulsion for safe transport, quiet operation and simple maintenance
- Pan and tilt stabilised gimbals
- Built in video enhancement features (stabilisation, visual tracking, target locking, mosaic-ing)
- Low life-cycle cost
- NATO standards compliant

GROUND COMMAND & CONTROL STATION

SPYBALL-B also includes the portable Ground Command & Control Station (GCCS) and associated antennas - common command & control component of all unmanned aerial systems. The GCCS is a custom-designed control unit which includes all the sub-systems needed to operate the UAS and its payload.

The GCCS has an overall weight of 7kg and an endurance of approximately 2hrs.

The Ground Data Terminal (GDT)

The GDT houses both the RF terminals and the central CPU, along with with the storage memory. It is also equipped with a GPS receiver for locating the UAV.

The Human Machine Interface (HMI)

combines live video feed and a map overlay onto a single monitor. It also includes a 7" touch screen and flight controls.

The Mission Controller (MCO)

is an optional Payload Operator Station consisting of a rugged PC equipped with proprietary software that connects to the SCCV to displays the same telemetry and video. A payload operator working on this station is able to perform payload video processing, leaving the GCCS Operator (pilot) to focus on flying the UAS. The MCO can also be used for mission planning, map preparation and general C4I.



GCCS MAIN FUNCTIONS

- Mission planning
- Map database management
- Command & Control of UAS through telemetry link
- Receipt of payload video through video link
- Navigation data and video recording
- Video processing (stabilisation, tracking, OSD)
- Storage of telemetry data and video stream

The GDT can be backpacked for ease of transportation or placed on the ground with an antenna support tripod. An Ethernet connection is available for real-time video and data dissemination to a C4I network.

Software

The GCCS contains both commercial and custom software. The custom software is developed according to RTCA-DO178 level B.

Compliance

STANAG 4586 via LAN, STANAG 4545, STANAG 4609.

TECHNICAL SPECIFICATION

| | |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Diameter | 0.48m |
| Height | 0.55m |
| Maximum Takeoff Weight (MTOW) | 2kg (±5%) |
| Speed | 28.8km/h |
| Endurance | >25min |
| Operational altitude (AGL) | 20m to 100m |
| Maximum operating ceiling (ASL) | 2100m |
| EO payload | HFOV 46° Sensitivity 0.025 lux (50 IRE) F1.2 3200°K 420 Tv lines Active pixels 640x480 Video output PAL |
| IR payload | HFOV 40° Spectral band [8,14] um Sensitivity (NEdT) at f/1.0 <50mk Resolution 320x240 Frame rate 60Hz Video output PAL (B) |
| Propulsion | Electrical (brushless) LIPO rechargeable battery pack |
| Radio link range | 5Km Line of Sight (LOS) |
| Data link | Uplink/downlink - 4 patterns of hopping |
| Video link | Downlink 4 selectable channels |
| Rain proof (MIL-STD-810F, 506.4) | 10 mm/hr |
| Operating temperature | -32°C to 49°C (MIL-STD-810F, 501.4 & 502.4) |
| Storage temperature | -32°C to 49°C (MIL-STD-810F, 501.4 & 502.4) |