

## APPENDIX A

### Aeronautics Defense Systems (ADS) Model Aerostar UAS Original Type Design Configuration/Performance Considerations

#### UAS Specifications



#### The Aerial Vehicle

##### Dimensions and weights

- Wingspan 21.3 ft
- Wing Area 35.7 sq ft
- Wing chord at root 2.0 ft
- Wing chord at tip 1.3 ft
- Total length 14.4 ft
- Height (on wheels) 3.8 ft
- Max T/O Weight 470 lbs
- Empty weight 231.5 lbs
- Max. fuel weight 99 lbs
- Max. Payload weight 140 lbs

##### Aerial Vehicle Performance

- Cruise/Loiter speed: 58-62 kts
- Dash speed: 80 kts
- Vmax: 110 kts
- Rate of climb: (b) (4)
- Service ceiling: 18,000 feet
- Endurance in loiter speed:

Altitude (MSL)	Endurance
5,000 ft.	12 Hr.
10,000 ft.	8 Hr.
14,000 ft.	6 Hr.

Note: Chart assumes Standard Atmosphere

- A/C Range using C-band data link:
- 60 nm
- A/C Range can be increased by handing off the A/C to forward controlled ground controlled stations. Range is further increased if the L/S bands are used.
- Take-off distance: 820 ft/ 1100 ft (sea level/ Fallon)
- Glide rate (no wind): 1:10
- A/C Temp Limits: -4°F to 153° F
- Stall speed flaps up: 42 kts (48.3 mph)
- Stall speed flaps 38 deg.: 38 kts (43.7 mph)
- Best climb speed: 62 kts (71.3 mph)

#### **Propulsion system**

- Engine type: Zanzottera 498ia – Opposed Two Cylinders Two Stroke Boxer
- Power: 38 HP at 6700 rev/min
- Propeller (pusher) of 28 in diameter and 28 in pitch. Laminated wood material.

#### **Electrical power supply system**

- Alternator (28 V/64A output alternator)
- Back-up batteries (28V)
- Provides 2 hours of backup power.

#### **Safety Features**

- Strobe and Anti-Collision Lights
- Mode 3 IFF transponder Squawking 5176 or 5177
- UAV warning NOTM prior to all flights 24 hours prior to flights.
- Redundant Power supplies.
- Emergency Return Home mode: Automatically returns home to a pre determined recovery location in case of both uplink failures. Returns on a predetermined path and altitude to minimize airspace conflicts.

#### **Payloads**

- DSP-1 - EO/IR/Laser Pointer (60lbs)
- MOSP – IR/Laser Designator
  - Significantly larger and heavier than DSP-1.

#### **Targeting Accuracy**

- The target acquisition accuracy for the Tactical UAV system has been calculated in terms of RMS (root mean square) under the following conditions:
- Aerial vehicle altitude above ground: 6000 feet
- Payload observation pitch angle: 45 deg.
- Slant range between the UAV and the target: 2.8 km.
- Target terrain altitude is known (from map) with accuracy of about 100 ft. (DTED maps data base)

Taking in account the major error contributors (UAV inertial angles, payload angles, altitude, UAV GPS coordinates), the target coordinates accuracy is 360 ft. CEP

#### **Level 3 Remote Video Terminal**

- Receives video images directly from the UAV.
- Controls airborne payload (including Laser Designator)

- Display map with UAV location coordinates and payload line of sight to target coordinates.
- Man portable.
- Range = 15 – 20 Nm  
(breakup will occur if flying over RVT)

**Audible Signature**

- The UAV can not be heard from the following altitudes:
  - Urban environment: 5000 - 7000 feet  
(Subject to environmental noise)
  - Open Area at night time: 12,000 feet

**Visual Signature**

- Daytime observers looking for the A/C can usually find it at distances around 1.8 miles (variable).

**Data-link system**

- **Down link**
  - C Band (b) (4) 10 watt - Directional/Omni-Directional
  - Information rate: 9600 BAUD
- **Up link**
  - Primary: C band (b) (4) – Directional/Omni-Directional
  - Secondary: UHF band (b) (4) – Omni Directional
  - Level 3 RVT: UHF band (b) (4) - Omni Directional