Aerospace Recommended Inputs Guide

Fixed-Wing UAV Edition — MQ-9 Reaper (Night Vision)

UAV Battery Efficiency Estimator

Aerospace Recommended Inputs Guide

1. MALE UAVs (MQ-1 Predator, MQ-9 Reaper)

These speed, altitude, and payload ranges are validated against open-source operator manuals and aerodynamic performance envelopes.

- MQ-1 Loiter: 100–130 km/h
- MQ-1 Cruise: 130–180 km/h
- MQ-9 Loiter: 120–160 km/h
- MQ-9 Cruise: 160–220 km/h
- Recommended Altitudes: 1,500–7,000 m depending on mission
- Payload (realistic): MQ-1 = 50–200 kg, MQ-9 = 100–350 kg

2. Tactical Fixed-Wing UAVs

Recommended inputs reflect typical RQ-11, Puma, Vector, and Teal-class aircraft performance:

- Valid Speeds: 30–110 km/h
- Operational Altitudes: Below 1,000 m
- Payloads: ≤50% of max for realism

3. Multirotor UAVs

Multirotor dynamics require conservative speed and altitude values for realistic endurance modeling.

- Speeds: 0–40 km/h (small), up to 60 km/h (large)
- Safe Altitudes: Below 120 m AGL
- Gust Limits: 0–6 recommended

4. Interpreting Outputs as an Aerospace Engineer

These ranges ensure expected aerodynamic behavior:

- Lower speed ⇒ higher induced drag and higher power
- Higher altitude ⇒ reduced drag and increased endurance
- More payload ⇒ reduced endurance
- Terrain, stealth, and gust penalties model real drag effects

5. MIT-Style Benchmarks

Benchmark flight points for validation and testing:

- MQ-9 Benchmark: 180 km/h @ 5,000 m, Payload 300 kg
- MQ-9 Loiter: 140 km/h @ 4,000 m
- MQ-1 Endurance: 130 km/h @ 3,500 m
- Puma: 60 km/h @ 100 m
- Small UAS: Hover or 20–30 km/h