



VOX Aircraft™ LLC presents a brief tech-talk on why speed matters so much in mission profile/planning

There are a plethora of sUAS and medium size VTOL UAV offerings. Many of them boast very long durations or loiter times on station, but their respective flight speeds are far juxtaposed on the other side of the performance spectrum. Indeed, almost all high aspect-ratio-winged, longer loiter capable sUAS and mid-sized VTOL UAVs are very slow in cruise flight modes. Most of them detailing cruise speeds in the ranges of only 65-80kts. This can be highly limiting if their intended target of choice or mission station is hundreds of miles away from a safe launch base or desired mission control point.

UAS Mission Capability-Flexibility-Repeatability Comparisons

Sample Mission: MRMUAS Overland ISR/Patrol/ID-Confirm/Deliver at 150 mile radius and 15min/deliver or 50 mile route monitor

Mfg. Model	Units of Measure	VOX M15-XS	L3-HARRIS FVR-90	Textron AEROSONDE HQ	Arcturus Jump-20	Martin V-Bat	VOX M50-XR
Airspeed	kts	150	65	65	72	90	180
Payload	lbs	22	32	15	28	8	38
Range	nm	680	470	90	100	350	750
Endurance	hours	8	18	8	12	8	6
Time to Deploy	min's	35	55	15	55	30	45
Gross T/O Weight	lbs	140	120	105	215	86	315
Size (W.S. x O.L.)	feet	16 x 15	15.4 x 8.2	14.5 x 8.1	18.5 x 9.4	9 x 8	18 x 16
Time to Target	hours	1	2.3	n/a	n/a	1.67	0.83
Poss. # of Deliveries	#	2	1	0	0	1	2.5
Surplus Time - Post 1	hours	5.75	2.37	0	0	4.1	4.15
Surplus Range - Post 1	nm	340	155	0	0	24	405
Poss. Route Scans	#	2	1	0	0	1	2.5
Poss. Mission Type	type**	ISR & Delivery	ISR & Delivery	n/a	n/a	ISR Only	ISR & Delivery
CTOLS Factor*	range*	low	low	low	low	high	low

Notes & Factors

- * Crosswind Take Off and Landing Sensitivity (CTOLS) of the airframe/system
- ** Missing type(s) that could be executed (primarily based on max. payload ratings)
- Surplus Time - Post 1 = Amount of endurance remaining after posting one complete mission
- Surplus Range - Post 1 = Amount of Range remaining after completing one mission cycle
- #'s = Number of missions that could be completed at gross weight, MEP, and fuel onboard
- MRMUAS = Medium Range Mission profile for mid-sized UAS airframes/systems

Too often mission planners use paper specifications to set or rather limit UAS mission profiles and or mission goals. Even to the point of thinking they don't "need" something or cannot create brand new profiles to consider. REF The chart above: Reviewing a typical Medium Range UAS Mission profile for mis-sized UAV offerings being considered for certain missions. Although some boast very long endurance times you will notice that those airframes cannot complete even one typical MRM profile based on range alone. The fact that they can loiter at some low flight speed becomes unimportant. Further, time to target is often a vital mission requirement or feature given up too early in the planning stages before deployments are decided on. Note that VOX's airframes in these categories can reach target locales in less than half the time and can even complete multiple mission cycles per fuel load!!