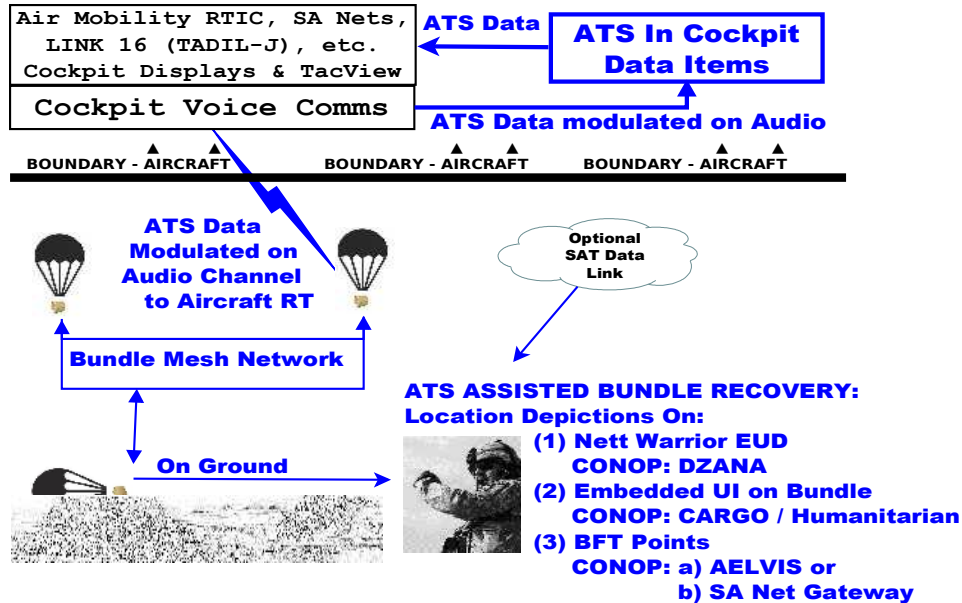


Constellation Data Systems, Inc. Airdrop Telemetry System* (ATS) Quad Chart

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Graphical Depiction: **ATS in Blue** (Other Courier Font/Black)



Operational Need, Gaps and Capability - on DZ / in Aircraft

- ✓ Airdropping cargo has reduced IED risks to warfighters.
- ⇒ Gap: Bundles not tracked post release, often lost.
- Capability:** Post impact bundle mapping & contents depiction.
- ⇒ Benefit: Mapping minimizes DZ time (enemy observation).
- “Grab the plasma and we’ll go. --- Leave the water!”**
- ⇒ Benefit: Facilitates location of missing bundles...
- “We’re missing the 5.56. --- Does ATS map an un-retrieved bundle?”**
- ⇒ Benefit: Risk management is synergized knowing contents:
- “The bundle carried by wind into the village. --- Contains food or C4?”**
- Capability:** In Cockpit depictions and data items.
- ⇒ Benefit: Post flight trajectory data improves airdrop:
- “Army says we missed the DZ with two bundles. The ATS data shows the last two bundles were 5 seconds late leaving the aircraft. Fix it.”**
- ⇒ Growth Path: feeds situational awareness (SA) networks:
- “Those A10s below us will know before the guided bundles glide in.”**
- Capability:** Humanitarian Airdrops, insures delivery.
- ⇒ Benefit: Accelerates humanitarian bundle recovery:
- “Tell the Sheriff to unlock the module on the first bundle he finds. Then press DZ-MAP. He can then go directly to the other bundles.**

Technology: Low Cost, Rapid Development, Prototyped & Proven

In Descent: Bundle to Aircraft Link.

- ⇒ No new aircraft Comms: data on existing voice channels.

On Ground: Post Impact.

- ⇒ Bundle mesh net, some non-line of sight capability.
- ⇒ Ground proximity VHF - bundle links over vast distances.
- ⇒ COTS RFIC transceiver radio frequency electronics.

Before Drop: Pre-release, integrates with guided airdrop.

- ⇒ Growth Path: Integration with Combat Airdrop Tool (CAT) *

GPS Denied: CONOPS anticipate future conflicts.

- ⇒ Growth Path: Through modern miniaturized sensor fusion.

Status of Generation 2.6 ATS Devices (Cincinnati Jun 2013)

- ☑ Bundle/aircraft Comms engineering demonstration.
- ☑ Bench & first airfield engineering tests.
- ☑ GPS telemetry and tracking engineering demonstrations.
- ☑ Module TRL (hardware/firmware) Bundle: 6/5 Cockpit: 5/4

Intellectual Property: US Patent Pending & Trade Secrets

Costs and Schedule - Rough Orders of Magnitude

Component	TRL	Type	Days	Costs
Bundle Module Generation 3	7	✓ Minimum	TBD	TBD
	8	✓ Recommended	TBD	TBD
Cockpit Module Generation 3	7	✓ Minimum	TBD	TBD
	8	✓ Recommended	TBD	TBD
GPS Denied CONOPS	7	Growth Path	TBD	TBD
	8	Growth Path	TBD	TBD
ICD: CAT *	NA	Growth Path	TBD	TBD
ICD: SA Nets	NA	Growth Path	TBD	TBD
ICD Iridium Nets	NA	Growth Path	TBD	TBD

* ICD: Interface Control Document (Conforms DOD ICD DID)
 * CAT: AKA Combat Airdrop Planning Software-CAPS/JPADS-MP
 * Note SA Nets: LINK 16 (TADIL-J) - JTIDS