UAV and aircraft 3D passive tracking

3D TDOA for accurate tracking and geolocation of UAVs and aircraft over wide areas

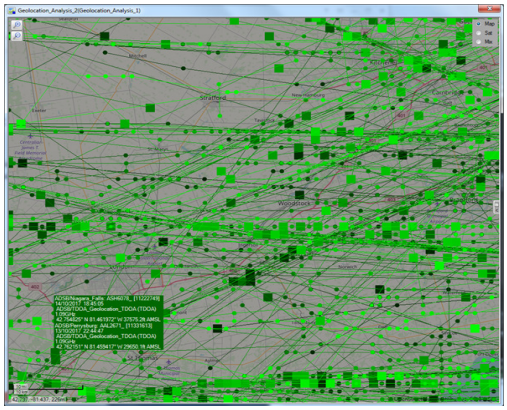
TDOA is a well proven technique for 2D geolocation which can be used to provide highly accurate tracking of RF-emitting targets over wide areas. The increasingly three-dimensional nature of threats has prompted a need for a 3D geolocation solution. The use of UAVs around sites such as airports and secure government compounds, and the spoofing of aircraft ADSB transmissions, are just two examples of such threats.

In response, CRFS has developed an enhanced TDOA technology that can provide accurate geolocation of emitters in three dimensions using a ground-based network of nodes. This network can track multiple ground-based and airborne transmitters, including aircraft and UAVs, in real time to provide latitude, longitude, altitude and speed data.

Our 3D TDOA solution also delivers excellent accuracy; we have demonstrated tracking of aircraft with errors as low as a few hundred meters over a range of hundreds of kilometers and 10 km altitude. Over smaller ranges, tracking accuracy of tens of meters is feasible.

Flight paths generated from 3D TDOA results can be viewed in the mapping tools of our state-of-the-art RFeye Site software, as well as being exported for overlay in Google Earth.

Flight paths can be tracked and shown in real-time



Typical deployments

- Military test and training sites
- Secure government compounds
- Government / VIP events
- Airports
- Prisons
- Space launch sites

3D TDOA

Our 3D TDOA software is a plugin to RFeye Site which enables a network of RFeye Nodes to be used to track airborne emitters. The same Nodes can be simultaneously used for other spectrum monitoring and management missions. To provide emitter geolocation in three dimensions, a minimum of four RFeye Nodes is needed.

The system can operate as a stand-alone emitter tracking system or as part of a broader UAV / airborne threat detection and defense system encompassing optical, radar, and countermeasure capabilities.

An environmentally hardened RFeye Node packaged in an Outdoor kit

Overall system features

- RFeye Nodes are environmentally hardened to support unmanned deployment in harsh conditions
- 3D TDOA network can be scaled to as many Nodes as required
- Although performance is optimized according to Node placement, Nodes can be located anywhere
- Can be used with both fixed and mobile Nodes
- Nodes and software are TRL9 and available COTS
- Multi-user multi-mission allows many spectrum monitoring and geolocation tasks to be performed simultaneously

Why CRFS

CRFS is a leader in real-time RF spectrum monitoring solutions for regulators, defense, security agencies and spectrum operations. Applications include spectrum management and enforcement, remote site and perimeter monitoring, real-time situational awareness, threat detection and signals intelligence. The RFeye® range includes best-in-class networkable receivers and nodes designed for remote, distributed, continuous 24/7 monitoring of the RF environment. Powerful data analytics and visualization tools provide actionable intelligence in complex and critical RF environments.

Get in touch to schedule a demonstration: enquiries@crfs.com

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