

# Unmanned Aerial Systems Beyond-Line-of-Sight Communications System



With more than 25 years of experience providing end-to-end managed communications solutions in any location, UltiSat is a flexible, quick-to-respond company with the global resources and expertise to design, build, maintain, and service customized communications systems, networks, and infrastructure.

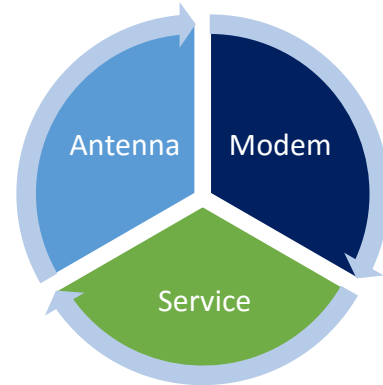


SelectTech GeoSpatial LLC is a satellite system integrator specializing in airborne communications focused on military, C5ISR, and UAS beyond-line-of-sight.



SkyTech Ltd. is a telecommunication company specialized in satellite "on-the-move" systems. The company is based on a team of experts in telecommunications, focused to design and accomplish sophisticated tracking systems for stabilized satellite antennas, including microwave and RF assemblies.

UltiSat, partnered with SelectTech GeoSpatial and SkyTech, have developed a unique size, weight, and power conscious system to allow medium-sized UAS aircraft the ability to be successful while BLOS. The system targets three critical areas and optimizes each with relation to the other to ensure the best connectivity. In keeping with UAS limitations, the entire package weighs just 27 lbs to include the Antenna Control Unit, Antenna, Modem, and Block Upconverters.

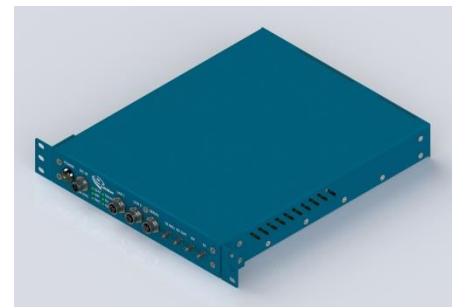


## 30 cm/11.8 in Airborne Antenna Terminal System (Dual Band)

The UltiSat team is ready to deploy the industry leading 30 cm/11.8 in. equivalent antenna system, which combines multiple bands onto a single radiant system. The assembly is an extremely light, compact and efficient aeronautical U-Sat antenna system, which is capable of simultaneous operation on Ku and Ka extended bands. It ensures unmatched connectivity and performance in relation to its size, due to its RF efficiency and tracking accuracy. Weight is approx. 17 lbs.

## iDirect TDMA-Compatible Small Form Factor Airborne Router

For optimal network efficiency, the antenna is combined with an airborne router based on iDirect's proven TDMA technology. The enclosure takes into account limited size and weight associated with smaller UAS without sacrificing speed. The modem is approx. 10"W x 12"D x 1.75"H and weighs just 6 lbs.



## Optimized Satellite Service

While other solution providers focus on equipment and protocols, UltiSat understands that efficiencies are governed by the network. By optimizing the network and taking into account transponder characteristics, protocols, latencies, and antenna gain, UltiSat can save millions of dollars over the course of a year. UltiSat appreciates that each customer's capability is unique and each network solution must match its customer's specific requirements.



The 30cm system is specifically designed to fit existing aeronautical mountings like helicopter upper tail stabilizer, fuselage top or nose. Since it is standardized, engineers can utilize known templates to fit UAS fuselage dimensions.

- Extremely light and robust carbon fiber composite frame and dish
- Highly engineered mechanics by extensive use of titanium and aeronautical aluminum alloys
- First and only 30 centimeter aviation antenna with three-axis stabilization, ensuring superior tracking capability even in highly dynamic maneuvers on flight
- Ku-band only, Ka-band only, combined Ku/Ka-band or contemporary
- Ku Cross-Polar or Co-Polar configurable
- Mechanical interfaces and swept volume allow easy installation and replacement of existing systems

**Reflector:**

30cm ADE RF tuned carbon fiber

**Antenna Weight:** ~9Kg \ 17.7 lbs.

**Operating Temperature:** -55°C / +60°C

**Standards:** DO-160 compliant

**Ku-Band:**

TX: 13.75-14.5GHz, Gain 31.5dB @ 14.125GHz (w/o radome)

RX: 10.7-12.75GHz, Gain 29.3dB @ 11.7GHz (w/o radome)

**G/T:**

8 dB/K @ 30° elevation (w/o radome)

Linear polarization w/ rotating skew (plus co-pol or TVRO config on demand)

**RX Amplification:**

60dB relative to feed input / <0.6dB total noise figure

**Ka-Band:**

TX: 28.1-31.0 GHz, Gain 37.7 dBi @ 29.5 GHz (w/o radome)

RX: 18.3-21.2 GHz, Gain 34.8 dBi @ 20 GHz (w/o radome)

**G/T:**

11 db/K @ 30° elevation (without radome)

**RX Amplification:**

65dB relative to feed input / <0.6dB total noise figure

**Antenna Power:**

20 to 36 Volts DC – 10A peak

**Performance:**

Elevation range: 0° to 95° (65 deg/sec)

Roll range: +/- 20° (50 deg/sec)

Azimuth range: unlimited 360° (70 deg/sec)

**Tracking accuracy:** < 0.2°

**Pedestal Type:**

4 axes; azimuth, cross-level, elevation, polarization skew

**Mechanics:**

60% carbon fiber composite

40% aluminum/titanium

**GPS:** All in view 12 channels internal

**Internal 3-axis gyro sensor:**

9 sensors with Kalman filter or external reference

**Tracking Possibilities:**

Geostationary satellites

Inclined Orbit satellites

**Lock Sources:**

Internal Broadband DVB-S2 Tuner

Internal Narrowband Tuner

External modem lock

AGC carrier level



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