



TERRAIN SERIES RADAR ALTIMETERS

RA-6500™ DESIGNED FOR 5G RESILIENCY

Reliable and accurate above ground level altitude ensures aviation safety in demanding environments.

STATE-OF-THE-ART RADAR ALTIMETRY AVAILABLE IN SINGLE OR DUAL INSTALL

The United States is supporting 5G systems deployment using a previously reserved radio frequency (RF) spectrum in the lower C Band (3.7 Ghz - 3.98 Ghz). In practice, this means that the spectrum, previously reserved for low-power applications, will now be available to the telecommunications industry for high-power transmissions and expected to expand globally.

These high-power transmissions have proven to affect radar altimeters with inaccurate altitude measurement readings, and recent studies confirm the likelihood and severity of interference increases for operations at lower altitudes - precisely where radar altimeter information is most important. Altitude readings are critical to the aviation industry for safe approach and landing operations for manned and autonomous aviation operations.

FreeFlight Systems specializes in NexGen avionics and radar altimeter products. With over 5,000 radar altimeters installed globally, the engineering team at FreeFlight Systems recognized the potential impact the growth of the 5G infrastructure can have on aviation safety. To address this issue, the team quickly developed the TERRAIN SERIES of aircraft radar altimeters designed to mitigate 5G spectrum interference. The RA-6500 is an advanced radar altimetry solution that uses digital signal processing technology and customized RF filters to provide high accuracy and all-weather performance. This single or dual-install system is an ideal retrofit solution using existing antennas, control heads, and cabling. Its performance surpasses the benchmarks set by lidar and laser, and the customized refresh rates of the RA-6500 ensure the safety of both pilots and passengers.



FreeFlight Systems

Founded in 2001, FreeFlight Systems designs, manufactures, sells, and supports avionics systems that improve flying safety, efficiency and affordability. We specialize in technologies and solutions that bring the benefits of the NextGen airspace transformation to all aerospace segments. We are known for the quality and reliability of our products, the flexibility and compatibility of our solutions, and our commitment to long-term client satisfaction.



RA-6500 PRODUCT SHEET

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5G C-Band resistance mitigates interference using customized RF filters and Digital Signal Processing (DSP) technology.

Multi-interface design supports RS 485/422, RS-232, ARINC 429 and 552A*, Ethernet connectivity and USB On the Go (OTG).

Robust, reliable, and rugged enclosure for mission-critical and military environments.

TSO-certified (TSO-C87a), and approved to DO-160G and DO-178C Level B.

Integrates with installed cockpit displays or optional standalone RAD-45 display indicators for LED AGL readings.

Dual install capable and integrates with popular glass displays and legacy analog indicators and antennas.

TECHNICAL SPECIFICATIONS

FREQUENCY

FMCW at 4.3 GHz center frequency, 200 MHz sweep at 4.2 to 4.4 GHz

ALTITUDE RANGE

-20 to 2500 ft (minimum)

ALTITUDE ACCURACY

0 to 100 feet AGL ± 1.5 feet
>100 to 2500 feet AGL $\pm 2\%$

OPERATING TEMPERATURE

-55°C to 70°C

TRANSMITTER POWER OUTPUT

500mW nominal, FMCW (typical)

POWER REQUIREMENTS

300 mA Max @ 28 VDC (steady-state)

UPDATE RATE

Minimum 25 times per second (25 Hz)

SELF-TEST

Power-on self-test and recurring built-in test

ANTENNAS

Dual; response angles up to $\pm 20^\circ$ pitch, $\pm 30^\circ$ roll

SERVICE CEILING

55,000 ft.

SIZE

Width: 3.06 in. (77.7 mm)
Depth: 6.78 in. (172.2 mm)
Height: 3.15 in. (80.0 mm)

WEIGHT

1.30 lb (590 g)

CONNECTORS

2x TNC antenna connectors
1x 66 pin circular connector

5G ROBUSTNESS

Compliant per AD 2023-10-02 and 2023-11-07*

*Please contact FreeFlight Systems for more detail.

ACCESSORIES



RAD-45 DISPLAY INDICATOR

Panel mounted and compliant with European and US Radar Altimeter display requirements, the RAD-45 is available as a standard or night vision goggle (NVG) capable display, offering an accurate and clear LED readout of AGL and trend information.

Specifications subject to change. Contact sales@freeflightsystems.com for latest revision.