For critical flight regimes, the new FreeFlight Systems RA-4000 and RA-4500 Radar Altimeters (TSO-C87) provide today’s flight crews with dependable, highly accurate and economical above-ground-level (AGL) information. This real-time system enhances operational safety during approaches, night-time operations, and hazardous flight above rough terrain.

These systems are especially valuable when flying search and rescue missions, forestry operations, pipeline maintenance, offshore helicopter operations, aero-medical emergency services, border patrol, and electronic news gathering operations. The RA-4500 Radar Altimeter with its ARINC 429 output can be easily coupled with modern electronic flight information systems (EFIS) and flight director systems. Proven and precise, both systems offer improved situational awareness for a broad range of fixed and rotary wing aircraft. Designed for applications such as helicopter and seaplane operations where accuracy is needed down to zero feet, the RA-4000 and RA-4500 Radar Altimeters provide precise AGL information from 2000 feet down to ground level.

Consisting of a remote unit and dual antennas for increased accuracy, the RA-4000/4500 series of radar altimeters are designed to be lightweight, easy to install, and flexible in aircraft placement. For the professional or private pilot, the RA-4000 and RA-4500 are essential safety tools at an attractive price.

**RAD-40 Radar Altimeter Display**

The RAD-40 Radar Altimeter Display (TSO-C87) is compatible with the FreeFlight Systems RA-4000 and RA-4500 Radar Altimeters. This panel-mount display provides critical AGL information to the pilot which is especially important when there are no visual clues to the landscape surrounding the airport or the flight path. The AGL information is displayed on a bright LED readout as reported from the RA-4000 or RA-4500 through a standard RS-422 serial interface. By simply turning the rotary knob on the front panel, the pilot is able to set a decision height (DH). When the preset altitude is reached, a DH LED is illuminated and a DH discrete output is set. Moreover, the pilot is able to activate five trip-point discrete outputs (100-1000 ft.) to signal additional alerts to the flight management system or navigation management system if the aircraft descends through these altitudes.

In addition to the standard version, a night vision goggle (NVG) compatible display is available. To simplify certain installations, a display mounted in a round faceplate adapter is also offered as an option.
RA-4000 and RA-4500 Radar Altimeters

**Specifications**

**RA-4000 and RA-4500**

- **Altitude Range:** -20 to 2000 ft.
- **Power Requirements:** 20 - 36 VDC; 400 mA MAX @ 28 VDC
- **Environmental:** -67°F to +158°F (−55°C to 70°C)
  
  Alt: 50,000 ft. (15,200 m)
- **Size (HxWxL):** 3.06 x 3.15 x 6.78 in. (7.8 x 8.0 x 17.2 cm)
- **Weight:** Unit: 1.9 lbs. (0.86 kg)  
  Ant. (2): 0.37 lbs. (0.17 kg)
- **Antenna(s):** Dual; response angles up to ±20° pitch, ±30° roll
- **Transmitter Power:** 100 mW minimum out of transmitter
- **Frequency:** Frequency modulated continuous wave  
  4.3-GHz center frequency sweep, 4.25 to 4.35 GHz
- **Update Rate:** 25 times/sec.
- **Altitude Accuracy:**  
  0 to 100 ft. ±3 ft.  
  100 to 500 ft. ±3%  
  500 to 2000 ft. ±5%
- **Display Disable:** Strut switch inputs
- **Self-test:** Power-on self test and recurring built-in test

**INTERFACE (INPUT/OUTPUT SUMMARY)**

<table>
<thead>
<tr>
<th>RA-4000</th>
<th>RA-4500</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inputs</strong></td>
<td><strong>Outputs</strong></td>
</tr>
<tr>
<td>Strut Switch</td>
<td>RS-485/422</td>
</tr>
<tr>
<td></td>
<td>RS-232C</td>
</tr>
<tr>
<td><strong>Outputs</strong></td>
<td><strong>Outputs</strong></td>
</tr>
<tr>
<td>RS-485/422</td>
<td>ARINC 429</td>
</tr>
<tr>
<td>RS-232C</td>
<td>RS-485/422</td>
</tr>
<tr>
<td></td>
<td>RS-232C</td>
</tr>
<tr>
<td></td>
<td>Optional ARINC 522</td>
</tr>
<tr>
<td></td>
<td>Analog</td>
</tr>
</tbody>
</table>

**CERTIFICATIONS**

- **FAA Authorization:** TSO-C87 Precision Equipment
- **Environmental:** DO-160E
- **Software:** DO-178B, Level C

**RA-40**

- **Specifications**

  - **Altitude Range:** -99 to 9999 ft.*
  - **Power Requirements:** 9 – 36 VDC; 450 mA @ 28 VDC
  - **Environmental:** -4°F to +131°F (-20°C to +55°C)
    
    Alt: 50,000 ft. (15,200 m)
  - **Size (HxWxL):** 1.39 x 3.54 x 4.62 in. (3.5 x 9.0 x 11.7 cm)
  - **Weight:** 0.38 lbs. (0.17 kg)
  - **Type:** LED, yellow seven segment
  - **Update Rate:** 2 times/sec.
  - **Decision Height Selection:**  
    10-ft. increments to 200 ft., 50-ft. increments from 200 to 950 ft.
  - **Flags:** Displays Dashes (”----”) when altimeter is unlocked
  - **Self-test:** Lights all “8’s” for LEDs and activates the DH LED
  - **DH Alert:** Internal DH LED and external discrete output
  - **Trip Point Outputs:** Five fixed trip points: 100, 150, 200, 500 and 1000 ft.

**CERTIFICATIONS**

- **FAA Authorization:** TSO-C87
- **Environmental:** DO-160F
- **Software:** DO-178B, Level D

* When used with the RA-4000 or RA-4500 altimeters, the display will show -20 to +2000 ft.

---

FreeFlight Systems
3700 Interstate 35 S.
Waco, Texas 76706-3756 USA
US: 800.487.4662
International: +1.254.662.0000
www.freeflightsystems.com

All Rights Reserved.

Made in the U.S.A. Specifications subject to change without notice.