

# COMPACT RADAR ALTIMETER

ELECTRONICS DIVISION

Models

ANV-410, ANV-420, ANV-430





The company has a strong heritage in the field of Radar Altimeters after entering the market in 1966. Since then it has developed its capabilities to design and produce state-of-the-art equipment that is in competition with major US and European companies.

**Fixed wing aircrafts** to meet integrity and dependability requirements for the Eurofighter Typhoon, PANAVIA Tornado and AMX. The Tornado Radar Altimeter has been designed to satisfy the most demanding low level Terrain Following/Terrain Avoidance (TF/TA) systems.

**Rotary wing aircrafts** to satisfy the most demanding NOE (Nap of Earth) and Hovering requirements. In addition to the normal test activity, it has been tested in-flight by the Italian Navy pilots on AB212 NLA (Special Operations). helicopters AB212, AB412, SH3D, CH47C, AB212AS, AB205, NH500, AW109, AW129, T129.

**Missile application** to provide low level terrain tracking or sea skimming.



The Compact Radar Altimeter (ANV-4xx) is the latest Digital Radar Altimeter developed by the company. It is based on a full digital redundant architecture offering an high accuracy and high resolution capabilities.

The system, successfully proven, is designed to fulfil the demanding requirements of the fixed and rotary wing combat aircrafts as well as for low level terrain tracking, sea skinning missiles, aerial photographic reconnaissance, precision hovering and Remotely Piloted Vehicles (RPV).

The Digital Radar Altimeter has been developed for multiple application, manned and unmanned.

All versions of the Digital Radar Altimeter are based on the same RX/TX module but with different interfaces and dedicated software applications.



The Compact Radar Altimeter is an high resolution short-pulse radar system providing continuous, selective, precision leading edge track of the terrain return echo signal. It provides:

- › Low Probability Intercept (LPI) and Anti Jamming/ Interference Capability.
- › Erroneous Height data < 10-9
- › Ready in less than 5 sec
- › Internal resolution comparable with a 13.3GHz sample (0.037 feet or 1,125cm)
- › state-of-the-art performance, low cost and supportability
- › ITAR free solution

Available as a standalone SWaP equipment, the Assembly Case houses up to 3 standard 3U boards (Radar Altimeter Sensor Board, Power Supply and one "optional" Expansion I/O board).

- › Based on state of the art technology command monitor architecture with complex HW developed in accordance with RTCA-DO254 DAL A
- › Altimeter Sensor Board is based on Common/Monitor architecture (non dissimilar) to mitigate erroneous height computation.

Those characteristics make Compact Radar Altimeter a perfect candidate for installation on new platforms as well as the right solution to upgrade ageing aircraft or helicopters, whose operational life needs to be extended.

The direct replacement of the Rx/Tx does not require any modification to the helicopter, nor any change to the cable harness. This allows a full backward compatibility and therefore a "smooth transition" from the old to the new Rx/Tx without logistic impact.

The auto-zero function available through PTT (Push To Test) signal allows the pilots to calibrate the AID (Aircraft Installation Delay) of the single machine on the ground without removing the Digital Radar Altimeter from the avionic bay.

## ORDERING CODE

- › ANV-410: Altitude max 15.000 feet
- › ANV-420: Altitude max 5.000 feet
- › ANV-430: Sensor Board (for external integration).

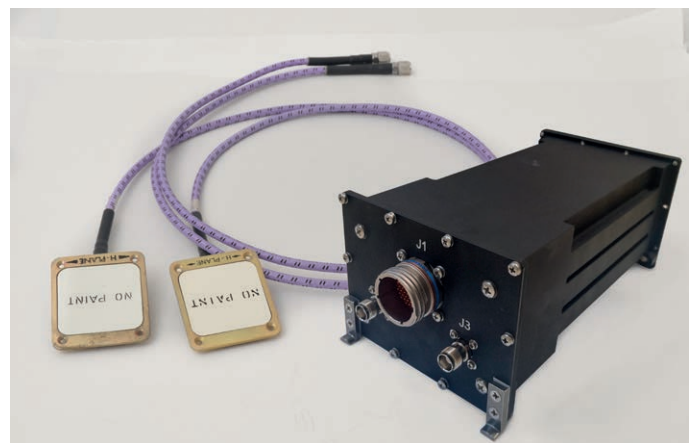
## TECHNICAL DESCRIPTION

Two antennas are provided for a single installation, identified by the P/N 03RS1001-2, having the following characteristics:

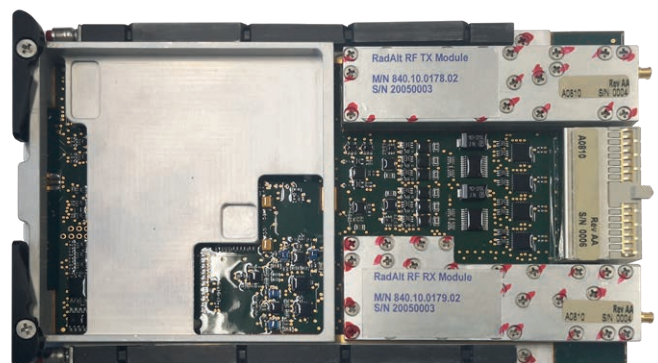
- › microstrip technology;
- › operating frequency of 4.3 GHz;
- › nominal impedance is 50ohm;
- › Standing wave ratio (VSWR) less than or equal to 1.8;
- ›  $\pm 25^\circ$  minimum beam width (measured at -3 dB level);
- › +10 dB gain above isotropic level (in the maximum radiation direction);
- › 85 dB minimum isolation between the two antenna;
- › coupling in H plane;
- › Linear polarization

## KEY FEATURES

- › Pulsed Radar Altimeter, maximum duty cycle 3%
- › Leading edge tracking technique
- › High resolution accuracy
- › Doppler effect immune
- › Low radiated power
- › Frequency agility
- › PRF jitter
- › Sensitivity Time Control (STC) management
- › Capable to operate in all weather, including heavy rain and snow
- › Thermal drift absent
- › On ground auto-zero procedure for AID (Aircraft Installation Delay)
- › Conduction cooled
- › Extended self test and BIT
- › Provides interfaces ranging from analogue to fibre optic connections to ease its integration with new or existing mission systems, making it the superior choice for upgrades to the most advanced platforms
- › Supported by an Obsolescence Management Plan and a Technology Insertion Plan which are common to several major programmes.



ANV-410 CRA System



ANV-430 RA Sensor Board

## TECHNICAL CHARACTERISTICS

### GENERAL

- › Dimensions (mm) 204 x 118 x 90.5
- › Weight < 1.7kg (RX/TX)
- › Power supply 28V DC
- › Power dissipation Less than 23W
- › Cooling Convection
- › MTBF >7000 hours

### PERFORMANCE

- › Altitude range up to 15000 feet
- › Frequency 4300 +/- 80MHz (C Band)
- › Maximum peak power Less than 1W
- › Accuracy ± 2 feet in range 0 - 100 feet  
± 2 % in range 100 - 5000 feet  
(± 1.5% from 5000 to 15000ft)
- › Height data rate Up to 250Hz
- › Hazard probability Less than 10<sup>-8</sup> per operating hour
- › Readiness for operation Less than 10 seconds

### MANOEUVRABILITY

- › Pitch/roll angle ± 60°
- › Height rate Up to 2000 ft/sec
- › Speed 800 KCAS max

### ENVIRONMENTAL

- › Temperature -40°C to +71°C (operating)
- › Vibration (random) 0.04 g<sup>2</sup>/Hz functional 0.17 g<sup>2</sup>/Hz endurance
- › EMC In accordance with RTCA/DO-160G

### UTILITIES

- › Associated Test Equipment
- › Special Type to Test Equipment (STTE)
- › Rig Support Equipment (RSE)\*

### APPLICABLE STANDARDS

#### Military

- › MIL-STD-810G
- › MIL-STD-704F
- › MIL-STD-1472D
- › MIL-STD-1474D
- › MIL-HDBK-454B
- › DEF-STAN 59-41
- › SAE-AMS-STD-595

#### Civil

- › RTCA/DO-254
- › RTCA/DO-160G
- › ARINC 429
- › ETSO-TSO-C87
- › EUROCAE-ED-30

### I/O INTERFACES AND FEATURES

- › Standard ARINC 429 and RS422 buses, Discrete IN/OUT
- › Test I/F RS485
- › Options Analog Out for legacy indicators, MIL-STD-1553/STANAG 3838

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