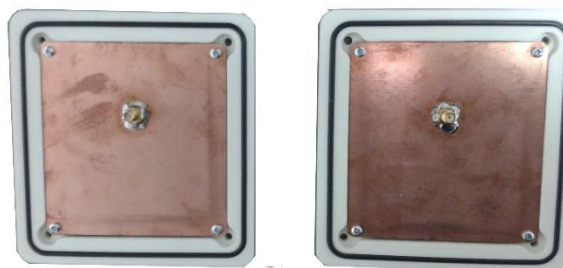


# RA-01 GA

## RADIO ALTIMETER

### ***OPERATION MANUAL***



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**This product is not approved for installation in type certified aircraft.**



**Use the RA-01GA only as an aid for VFR navigation**

## 1.- DESCRIPTION

The **RA-01GA** system is a radio altimeter that provides AGL altitude information from 0 feet up to 1900 feet.

The components of the system are:

- **RA-01GA** Main Unit
- **RA-01GA** Display
- Two patch antennas
- Two RF cables
- One Main Unit to Display cable
- One power cable

## 2.- SPECIFICATIONS

- Altitude range: 0 to 1900 feet
- Accuracy: Altitude:
  - 0 to 300 feet = 3 feet
  - 300 to 3500 feet = 15'
- Frequency range: 2400 to 2483 MHz
- Input voltage: 12vDC
- Input current: 500mA
- Self test: Yes
- Environmental: -20°C to +65°C
- Size/weight:
  - Main unit: 144x74x58 mm / 490 gr
  - Display: 78x63,5x63x5 mm / 210 gr
- Antennas (each one): 124,4x130,5x11 mm / 150 gr
- Update display rate: 3 Hz
- Antennas separation: 32cm/1 feet (minimum)
- Warnings: DH, ULM, GEAR
- Protection: Against reverse polarity
- Connectors:
  - Main unit: 2 SMA, 2 Sub-D 9 pin, 1 Sub-D 15 pin,  
1 Binder (power)
  - Display: 1 Sub-D 15 pin

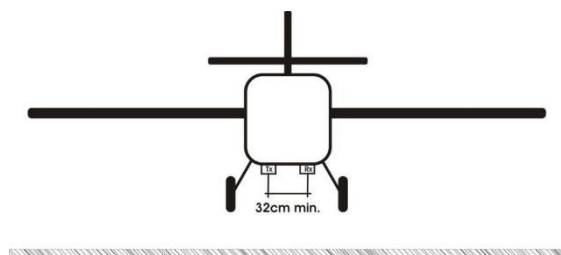
*Specifications subject to change without notice*

### 3.- INSTALLATION MANUAL

In order to obtain satisfactory performance from the **RA-01GA**, the suggestions proposed below are strongly recommended.

#### 3.1 ANTENNAS INSTALLATION:

1. It's important to situate the antennas symmetrically from the centerline of the plane.
2. The antennas must be located as far as possible from other near antenna or other protrusions like landing gear or similar objects.



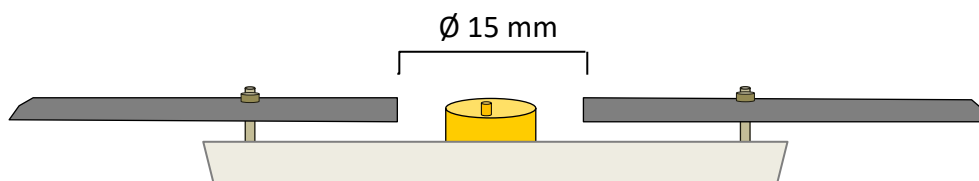
3. The antennas plane must be parallel to the ground.
4. The antennas must always be mounted with the arrows to the front of the aircraft.
5. The antennas must always be mounted at more than 32cm/1 feet from each other.
6. Be sure to place the antennas farther than 90cm/3 feet away from DME, Transponder, VHF coms radio, etc.



7. Avoid locations near high vibration, heat or oil sources.
8. The supplied antenna cables are factory calibrated so, do not use other type of cable.

**9. The antenna connector and the cable connector must be isolated from the aircraft contact.**

To get this, drill a 15 mm hole centered in the connector to pass through the cable.



Once the antennas are correctly fixed to the aircraft, you can install the Main Unit.

### 3.2 MAIN UNIT INSTALLATION:

The **RA-01GA** Main Unit is supplied with a base plate to fix it correctly to the base of the aircraft. This plate allows fix the unit in any position.



The sole thing you must have in mind is the supplied cable length. So, place the Main Unit where the cable can arrive without excessive bends to the antenna.

**IMPORTANT:** *the supplied RF cables are very high quality cables and must be routed with extreme care to avoid any break or excessive bent.*

Avoid in the neighborhood of the **RA-01GA** Main Unit, sources of interfering signals like transmitting equipment, spark, ignition circuits, etc.

Avoid to route the supplied RF cables together other cables of any type.



Connect the supplied DC cable to a proper protected power point with the following code:

12VDC +	→	RED
GND	→	BLACK

### 3.3 DISPLAY UNIT INSTALLATION:

The best recommended place to locate the Display Unit is in front of the eyes of the pilot, probably in the top of the instrument panel.



The Display Unit standard size allows to situate it in any standard hole of 2"¼

Connect the supplied cable from the Main Unit to the Display and maintain it as far as possible from any other cables.



### 3.4 AUDIO OUTPUT PIN-OUT FOR THE VOICE SYNTHESIZER :

- Central connector "service"
- Pin 5 : - speaker
- Pin 9 : + speaker

## 4.- OPERATION MANUAL

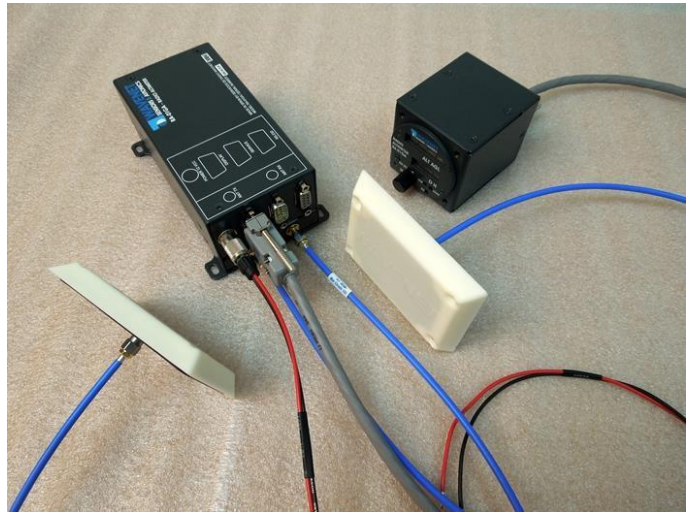
The **RA-01GA** system utilizes SMD components in its construction, so, it has a high level of reliability in any type of aircraft maneuvers.

- Once the installation is complete, the pilot can apply power to the system.
- Once turned on the **RA-01GA** the unit performs the self-test routine and then will show you the selected DH (decision high) and the AGL altitude.
- On the ground the AGL will be “0” or around “0” depending on the surrounding buildings.
- On air, once the aircraft have took off the AGL reading will start to show the true altitude over the ground until reach 1900 feet, when the **RA-01GA** will show you “- - -” meaning that the system is out of range. If at that point the pilot starts a diving maneuver, the **RA-01GA** will show again the value of the true altitude between the plane and the ground.
- **USING THE DH SELECTION AND ALARM**
  - The DH window shows you a preselected altitude point where you would like to be advised.
  - Once the airplane arrives to the selected DH, an audio tone will sound “beep” plus a front panel LED lights.
  - In addition the Display Unit has a Gear Warning factory calibrated to 300 feet AGL.
  - If needed the **RA-01GA** can be programmed with other Gear threshold.
  - The ULM warning is solely equipped for some countries where the maximum ULM flight altitude is limited generally to 1000 feet.
  - The DH default value is 50 feet.
  - To choose a specific DH:
    - Rotate to desired value.
    - You can do the DH adjust on ground or in flight.



## 5.- PHOTOS, PARTS DESCRIPTION AND MOUNTING PLATES

The **RA-01GA** system includes: 1 Main Unit  
1 Display  
1 Antenna Tx  
1 Antenna Rx  
2 RF cables  
1 Power cable  
1 Cable to unit Display with Main Unit



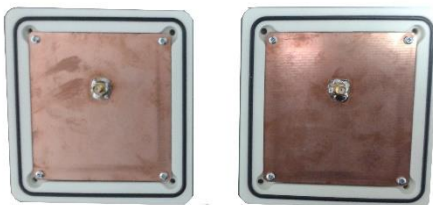
**MAIN UNIT**



**DISPLAY**



**ANTENNAS**



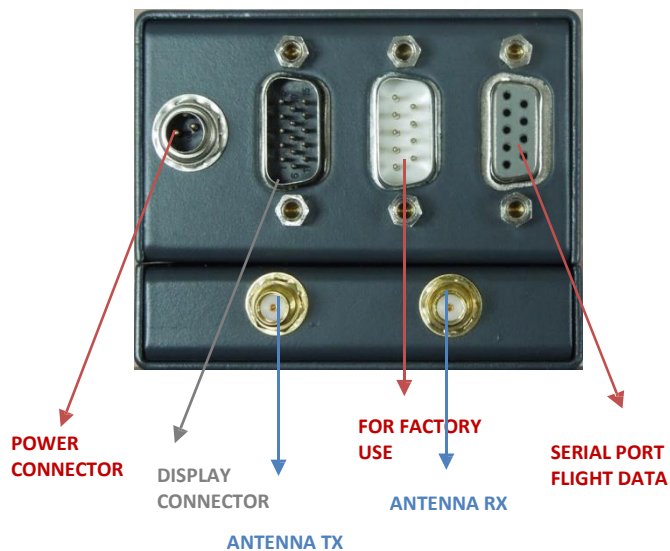
**RADOME ANTENNAS**





## PARTS DESCRIPTION

### MAIN UNIT



### CONNECTOR MAIN UNIT



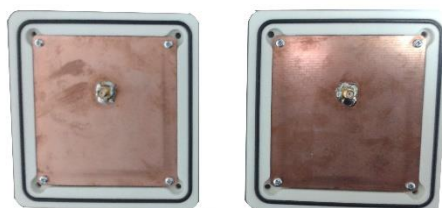
### DISPLAY



### CONNECTOR DISPLAY/MAIN UNIT



### ANTENNAS



### RF CABLE



## 6.- APPENDIX

### 1. Information

Information in this document is subject to change without notice.

### 2. Changes

WAVENET reserves the right to change or improve its products and to make changes in the content without obligation to notify any person or organization of such changes or improvements.

### 3. Software License Agreement

By using the RA-01GA, you agree to be bound by the terms and conditions of the following software license agreement.

Please read this agreement carefully.

*Wavenet grants you a limited license to use the software embedded in this device (the "Software") in binary executable form in the normal operation of the product. Title, ownership rights, and intellectual property rights in and to the Software remain with Wavenet.*

*You acknowledge that the Software is property of Wavenet and is protected under the Spain copyright laws and international copyright treaties. You further acknowledge that the structure, organization, and code of the Software are valuable trade secrets of Wavenet and that the Software in source code form remains a valuable trade secret of Wavenet.*

*You agree not to decompile, disassemble, modify, reverse assemble, reverse engineer, or reduce to human readable form the Software or any part thereof or create any derivative works based on the Software. You agree not to re-export the Software to any country in violation of the export control laws of Spain.*

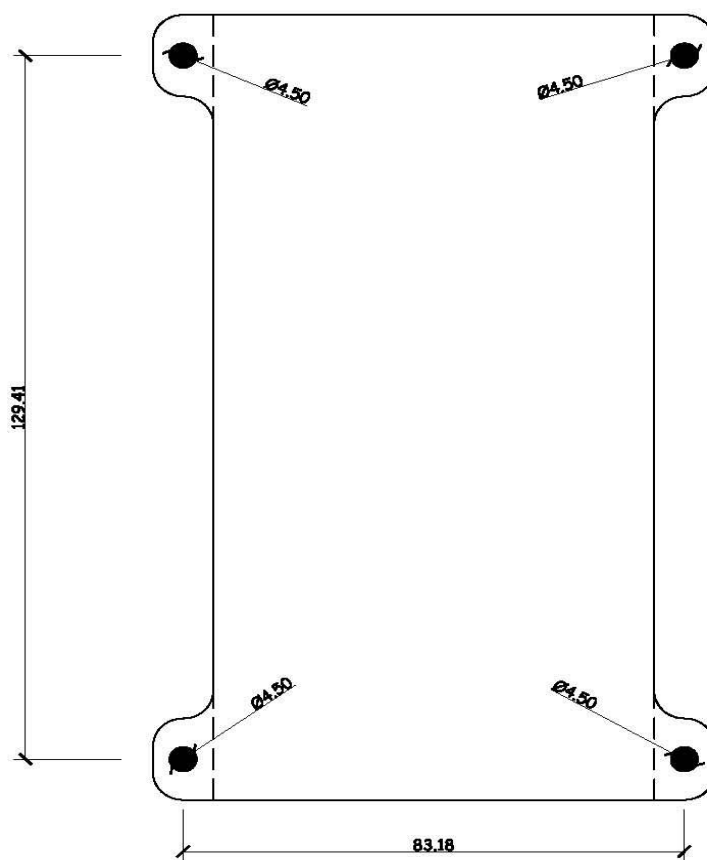
#### **4. Limited Warranty**

This Wavenet product is warranted to be from defects in materials or workmanship for two years from the date of purchase. Within this period Wavenet will at its sole option repair or replace any components that fail in normal use.

Such repairs or replacement will be made at no charge to the customer for parts or labor, provided that the customer shall be responsible for any transportation cost. This warranty does not cover failures due to abuse, misuse, accident, or unauthorized alteration or repairs.

The warranties and remedies contained herein are exclusive and lieu of all other warranties express or implied or statutory, including any liability arising under any warranty of merchantability or fitness for a particular purpose, statutory or otherwise. This warranty gives you specific legal rights.

Wavenet retains the exclusive right to repair or replace the unit of software or offer a full refund of the purchase price at its sole discretion.



PROYECTO: <b>RA-01-GA</b>		
ELEMENTO: <b>PLANTILLA TALADROS</b>		
VISTA:		
COTAS: MILIMETROS	ESCALA: 1/1 (A4)	15/01/2014