
Briefing Statement

RadioStrat: a journey to the stratosphere

Barcelona - 5/9/17

RADIO STRAT

the space adventure.

RadioStrat is a project started and driven by a bunch of Baccalaureate students who, as a compulsory research work for final year students, have decided to send a space probe to the stratosphere. All four of the group members study the science and technology branch of the Spanish Baccalaureate, two of which - Roc and Ignacio - are interested regarding the world of aeronautics, and the other two - Roger and Carlos - in the world of computing and telecommunications. Together we figured that sending a space probe would be the kind of project that would take the four of our interests into account: in order for the apparatus to ascend and descend smoothly some aeronautical systems need to be applied. Similarly, if we want to keep track of our probe (for instance, to know where it's landed) some electronic and telecommunications systems need to be put in place.

When we started this journey we had three clear goals: overcome the height of 30km getting our space probe back intact, keep track of the apparatus (and all its sensors) live throughout the whole flight and involve as many people as possible in our project, making our educative message known so that more people would get involved in similar projects. This statement is an effort to achieve the third of our goals. When I was invited to present my project to the international radio associations I knew I couldn't miss such a chance.

How we intend to pull this off might seem a bit complicated at first, but it's actually fairly simple. Our design (similar to many others) consists of a porexpan square box (since it acts as such great thermal insulator, is light and inexpensive) that will contain all the electronics. With a 12m nylon rope, this box will be attached to a 3.000g helium balloon which will propel it. Once it reaches a height of about 35 km, the pressure of the gas inside the balloon (due to the concentration difference with the stratosphere) will reach a point that will make the latex collapse, making the balloon explode. At that point, the descent will begin. Due to friction with air, the parachute that will be thoughtfully placed between the box and the globe will deploy, allowing for a descent at moderate speed and therefore a smooth landing.

The equipment on board will consist of three independent systems: a GoPro camera, an electronic system known as 'Trackuino' and a GPS by GSM.

The GPS by GSM works quite simply: all it needs is a SIM card and a battery. When you call the SIM card number, it automatically hangs up and sends you, in an SMS, its location (in coordinates). To send the message it is using the GSM network (also known as 2G - second generation). That means that there is the risk the probe lands somewhere with no connection, and therefore it is unable to report its exact location through this system. Also because of the GSM network, this system only works at a low altitude (no more than a thousand meters). For this reason, the only purpose of this device is to let us know the exact landing coordinates (rather than keep track of it during the entire flight).

The Trackuino system is the most interesting of all. Put in a few words, it is an electronic system that centralizes all the data input from all the different sensors and devices on board (except for the camera and the GPS by GSM) and sends them live, through a radio transmitter, so that we can track the space probe and all of its readings. This system is based on an Arduino Uno shield, and has, connected to it, two temperature sensors (an outer and an inner one), a GPS (thus the system acts as an APRS device), two antennas (for the GPS and for the radio transmitter), the radio transmitter and a buzzer (which will

ring once the space probe lands so that it is more easily found). For any further details regarding the Trakuino system please check '<https://github.com/trackuino/trackuino>'.

It is worth noting that the entire flight will be transmitted live through the website '<http://www.aprs.fi/>', or any equivalent app for both iOS and Android devices (APRS tracking apps). The flight is scheduled to take place the 25th September, this month, and you will be able to find it after the following indicative: EA3URC-9.

This has been a quick glance to our project. We are very passionate about it and hope everything will go as planned. Here attached are two links: to our website and to our crowd funding campaign (which, although is over, still has the explanations, pictures and videos). Please, note that you can subscribe to our newsletter to keep up with all updates.

<https://www.verkami.com/projects/18298-radiostrat-un-viatge-a-lestratosfera>

<https://radiostrat.wixsite.com/radiostrat>

Note that you can follow us in both Twitter and Instagram at [@radiostrat](#).

Also, in case you have any enquiry, please do not hesitate to contact us:

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