

Radio Sondes (Weather Balloons)

By Dave Thorpe G4FKI

I recently spent a week at a Met Office weather station in Cornwall, and spent some time observing the operation of Radio Sondes, this feature looks at the principles of this devices.

The first recorded use of Radio Sondes in the UK was in 1936. During WWII, the army used Sondes before going into battle to determine weather conditions. The army still make use of Sondes in current day battles.

A Sonde is a device that is attached to a helium filled balloon, it is battery powered, and has various sensors that measure the temperature by using a thermistor, the temperature range for the thermistor lies between approximately -60°C to $+90^{\circ}\text{C}$. Air pressure is measured over a very wide range using a aneroid barometer. The humidity is measured using a hygristor this is a sensor consisting of a glass slide or plastic strip covered with a moisture sensitive film of lithium chloride (LiCl) and a binder; metal strips are located along the edges. The electrical resistance of the chemical changes with a change in the atmospheric humidity, a GPS receiver and a UHF low power transmitter is also incorporated. Earlier models were tracked using radar for their locations, and had a 27MHz transmitter.

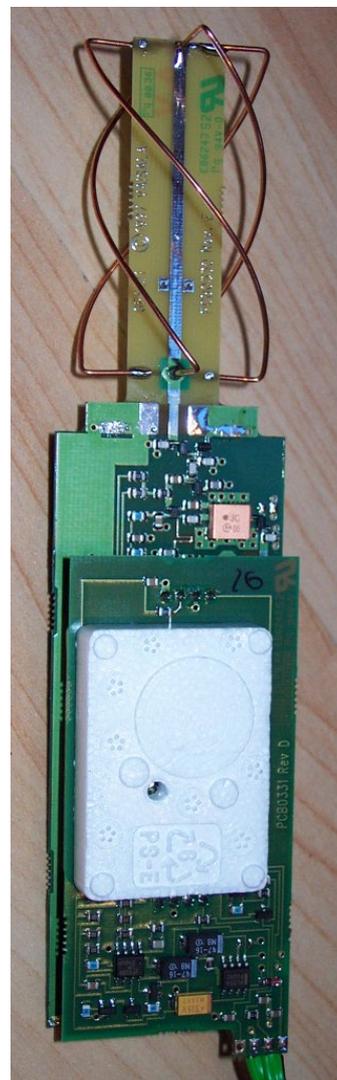
The majority of European Sondes are manufactured by a company called Vaisala, a typical example is shown. The UHF transmitter, which only has around 100 milliwatts of power, transmits 1200 baud data. The battery is designed to last between 2 and 3 hours, and the total weight is around 220 grams, including the polystyrene packaging.

Sondes are launched twice a day at various locations around the UK at 12.15 am and 12.15 pm, they take around $1\frac{1}{2}$ hours before the balloon bursts at a typical height of 20km above ground and up to 200km from the launch site; this is all depends on the direction and speed of the wind.

There is a small parachute attached which slows the descent of the Sonde, when it eventually returns to the ground it is then of no further use.

It is possible to receive Radio Sondes on a standard radio scanner over a 100km range depending on how sensitive your receiver is and how your antenna is positioned, you can download a programme that will give you Sonde data including its Position.

If you e-mail me, I can send you a current list of sites and frequencies. The May 2006 Radio User magazine has some useful information regarding decoding.



73

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Links

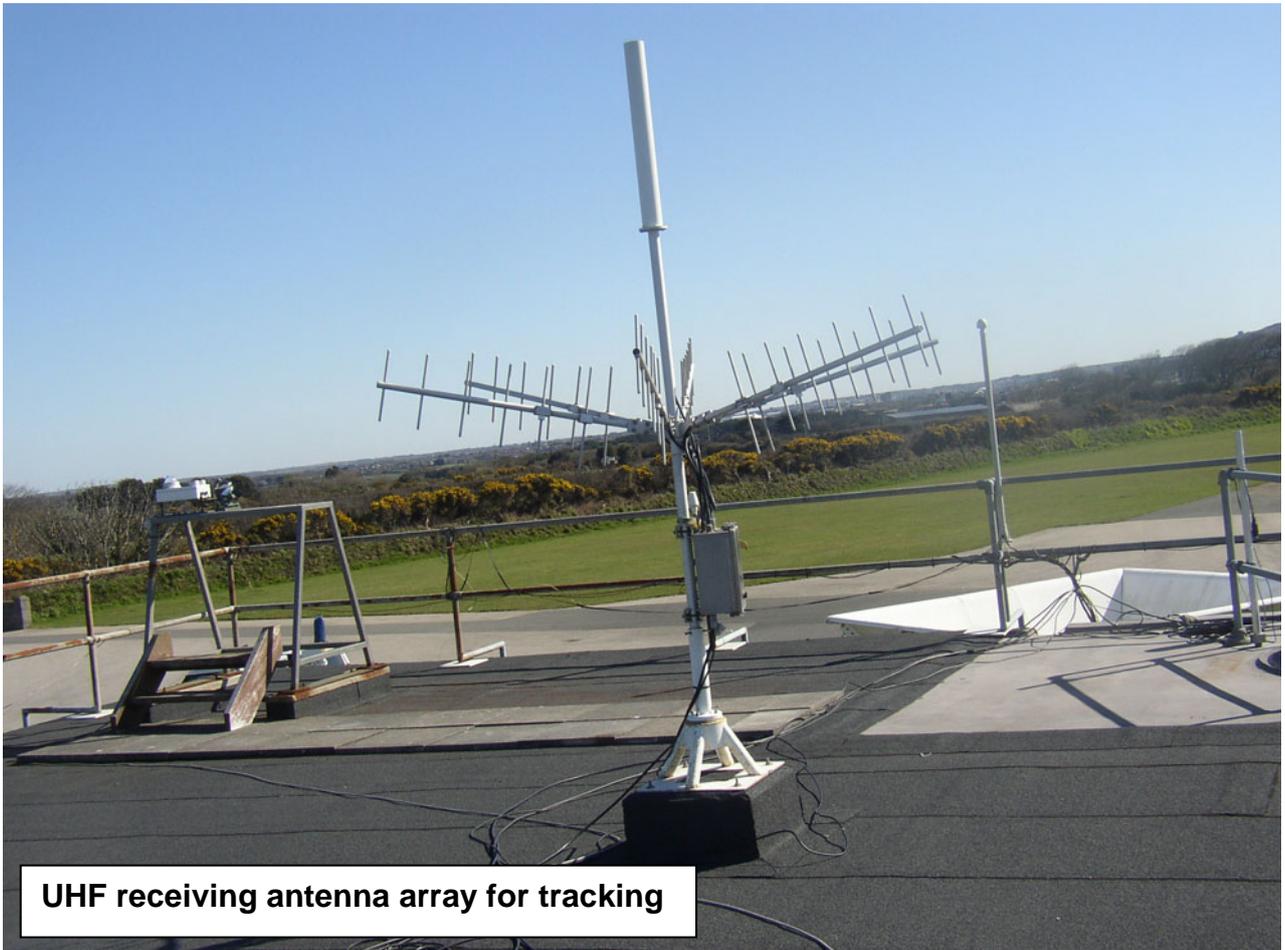
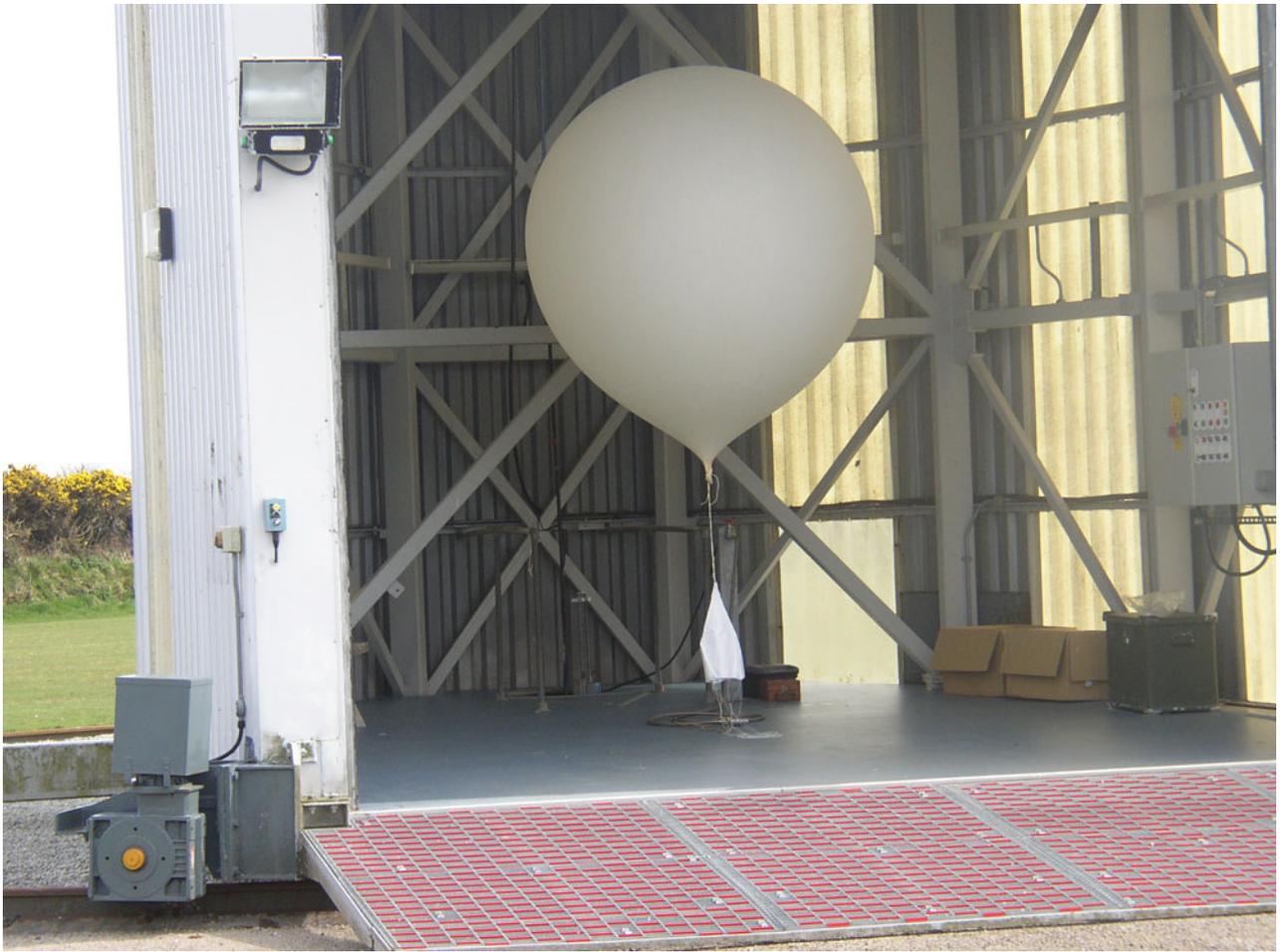
The following links give more details and decoding software

<http://www.metoffice.co.uk>

<http://www.coaa.co.uk/sondemonitor.htm>

www.lefars.org.uk





UHF receiving antenna array for tracking