The Launch

Final antenna tuning for the balloon-side eggbeater and final testing of the cutdown device was completed by Friday afternoon. The treble boost filters for the ground side stations were lacquered to prevent damage and to increase ruggedness.

After spending the majority of Friday getting things ready and loading electronics, antennas, and everything else into the minibus and car, we set off for Stratford-upon-Avon at just after 4 o’clock. The journey was uneventful and after arriving, unpacking and eating, the minibus team were given a quick tutorial on the setup of the electronics and the use of APRSPoint for tracking the balloon in the air.

An early start on Saturday morning saw us at the launch site at the Queen Elizabeth Humanities College in Bromyard by 9:00. Antennas were quickly attached to the top of the car and the minibus, and the helium cylinder was unloaded from the back of the minibus. We flipped the screen on the camera over to turn it off, and inserted the SD card, before powering up the eletronics using the Lithium Thionyl Chloride batteries. The system booted first time, and started beaconing and taking pictures as soon as the GPS got a lock on satellites.

The helium and filling equipment were taken onto the field, along with the balloon and parachute. Whilst this was happening, the 433 Mhz set on the payload was powered up and the back of the payload box was sealed shut with glue gun. Filling the balloon started at 10:45 and half an hour later we had tied the balloon up. The car was driven onto the field so we could watch the tracking system and ensure it was seeing the beacons without having to keep running back and forth across the field.

The antenna had been attached to the bottom of the payload box, and the payload cords had been tied to the parachute shroud lines and laid out on the ground to prevent them becoming tangled. After tying the balloon to the top of the parachute, we realised that the balloon would not have enough free lift to carry the payload. As such, everything was disassembled and more helium was added to the balloon to increase the weight it could lift. When finished, the parachute was once again tied to the balloon. The camera mount dislodged somewhere in this process, but this took a couple of minutes to fix.

It was 11:45 by the time everything was ready to launch again. The payload had been running throughout the process so we could verify everything was working, which it was. Each beacon had come in precisely on time and without fail. Once everything was in the launch position, we waited for three beacons to come in whilst the final flight checks were carried out on the payload and flight string.

The balloon was released at 11:55 and it ascended very quickly over the rooftops of the college. Our first altitude reading was at 12:13 read 9300ft. We immediately noticed that the GPS was not consistently telling us the altitude – only one in every five to ten beacons contained an altitude reading. The reasons for this were unknown.

The balloon headed north, so we jumped in the vehicles and set off after it. By 11:20 it had already passed 12,00ft and was still heading north. It had a good head start, but we followed it North up the A49 towards Shrewsbury. It hit 24,000ft at around 11:45, and then passed over Shrewsbury at 30,000ft at around 13:00, before staying relatively still until 14:00, but still climbing. At 14:08 we received the highest confirmed altitude at 72,549 ft just North of Shawbury. From here, the balloon began to head east very slowly.

The tracking system in the minibus had been playing up since we left the launch site, and the car station was the only one reliably picking up packets from the balloon. After trying several different things, including a hardware TNC, a change of antenna eventually fixed the problem. The SWR of the minibus eggbeater had jumped to >3. After switching to the helicoidal, the system picked up packets much better.

Since it had been staying nearly still for more than an hour, we had stopped in a Tesco car park to sit and watch. At 14:17 the final beacon came in before the GPS lost lock on satellites. We expected this to happen, as this particular model is altitude limited. However, we did not expect the balloon to travel very far as wind is almost non-existent at more than 70,000ft.

As it happened, the balloon was travelling very fast towards the East. But since the GPS had no lock and we were certainly not expecting this, we did not know this. When the GPS eventually found a lock on satellites again at 14:55, it was more than 140km east, near Grantham. We picked up six beacons from there, which is rather impressive given the distance involved. From the pressure readings, it was evident that the balloon had burst and that the payload had begun its descent to Earth.

We considered the possibility of the GPS being wrong, and therefore staying where we were until the balloon came down a bit further. However the fact that we had had six beacons, all around the same place, and that the signal was significantly weaker than earlier, convinced us that the GPS was correct and that the payload really was miles away. The very last we heard from the payload was a reading at 15:03 as it headed North again towards Sleaford. From its pressure reading, we estimate this was from an altitude of around 34,000ft.

We jumped back in the vehicles and sped towards Grantham as fast as possible, but even though we had tracking equipment running in both vehicles during the entire journey, we did not receive any more radio beacons from the payload. By the time we reached Grantham, the airwaves were still completely silent. We drove around a bit in the car whilst the minibus caught us up, around Newton and Haceby, but we still could not hear anything. Either we were just too far away from the payload, as we didn’t have an accurate enough idea of where it was, or the payload was damaged on impact and stopped transmitting. In this case, it could have been on the other side of a hedge and we would still not have noticed it.

By this point it was getting late, and at around 17:30 we decided we had to give up the search, as a three hour drive back to Surrey was required to get home. We eventually got home after 22:00.

At the time of writing, we have still not found or recovered the payload. It has contact telephone numbers and the promise of a reward on its side, so hopefully someone will come across it and return it sooner or later, although hopefully sooner.