# Launch Day Overview

Provided you are prepared, and take your time, launch days should be relaxed and fun, and not stressful. Never seems to work that way but it’s a good goal to have!

Overall the day is split into Launch, Chase and Recovery:

1. Launch
   1. Unpack
   2. Set up 3G
   3. Start up the tracker
   4. Tune in receiver and upload to the internet
   5. Close up payload
   6. Fill balloon
   7. Tie on parachute, payload
   8. Launch!
2. Chase
   1. Pack up
   2. Drive to the expected landing area
   3. Wait for the burst
   4. Wait for the predictions to settle down
   5. Drive to the landing area
   6. Get the best final position
3. Recovery
   1. Drive to near the expected landing position
   2. Get an updated last position
   3. Find the best route (by car and then foot) to the landing position
   4. Ask for permission to enter private land
   5. Recover the payload

## Launch

We’ll unpack everything first. As this is a shared launch there will be a single groundsheet, gas cylinder and balloon filler for all. When you do your own launch, get the car unloaded and put a table up if you have one (much nicer to work on a table than the ground when you’re putting the final touches to the payload, or getting your laptop tracking set up). Lay out the ground sheet and peg or put weights on the corners to stop it taking off. Put the cylinder and filler on the ground sheet, together with the other items that the person filling the balloon will need(balloon, filler, snips, scissors, cable ties, duct tape).

Meanwhile, get your 3G MiFi devices started and connect to those with your Pi receivers, tablets and laptops.

At this point it’s worth running final predictions to see if they’ve changed, and if anything needs to be done (e.g. change the amount of gas).

Next, start up your trackers. These will run for about 20 hours on their batteries (you’re using fresh batteries, right?!), so there’s no need to wait. Wait about 1 minute to allow the boot process to completely finish, then tune in to the RTTY transmission with your radio scanner. Connect the scanner audio to the tablet audio, run the HAB Tracker app, start the decode function and check that it locks in and starts to decode your transmissions. Once that happens, and the tracker has GPS lock, then your flight should appear on the internet map. We will have a laptop set up for that.

Put an address label inside the payload, then close it up and secure it with duct tape. Put another label on the outside. Tie the payload to the parachute using 10m of cord, and tie a separate 5m length to the top of the parachute. Bring that top line from the parachute to the filling area. Tape over all knots.

Meanwhile, the person in charge of the balloon can start the filling process. Fit the balloon neck over your filler tube, leaving enough of the beck free for sealing later. Then tape down with duct tape over the end. Fit 2 cable ties to stop the balloon from escaping. Attach the neck lift bottle to the filler with cable ties. Open the gas valve and allow the balloon to fill. Fill until it can hold the water bottle in the air without the bottle coming back down. If it’s windy, wait for a lull in the wind before doing this. If in doubt add more gas.

Once the balloon is full (it can hold the neck lift bottle clear of the ground) then the balloon can be sealed with 2 cable ties, and the parachute line tied around the neck. We now need 2 people working on the balloon; one person removes and holds the balloon, whilst the other folds over the neck, seals with a cable tie, cuts off the free end and protects the sharp edge with duct tape.

We now check with local air traffic control. Once we are cleared for launch, then put on some gloves, hold the balloon neck and gradually allow the balloon to lift by walking the line up from one hand to the other, passing the parachute until you are holding the payload. Check the skies for aircraft, then if it’s clear let go of the balloon.

If it’s windy, we will advise on the best launch technique to cope with the conditions.

## Chase

Once your flight has launched, it’s time to pack up and start chasing. Generally there’s not a great deal of time to waste, but if the predictions are for a newrby landing then it might be OK to wait a while and watch the images coming in. We will advise at the time.

Provided that the ascent rate is as expected, then we can assume that the previously predicted landing positions is fairly accurate, so you should drive in that general direction. What you want to do is park somewhere with a 3G connection and with good roads to all 4 compass points. Remember that the balloon may not burst when we expect, so we need to be ready for any possibility.

Once the balloon has burst then the landing prediction will start to get more accurate. Wait a few minutes for that to settle down, then find somewhere to drive to where you will be close to the landing position. Again, remember that this will change, so you need to be in a position where you can easily drive in any direction. You also need 3G in order to see the landing prediction point, so make sure you have a 3G signal.

As the flight comes into land, you will be (or should be!) the closest receiver to it. If you are, then you should have the best chance of getting the lowest update from the balloon before it lands. If say you can get a position 200 metres up, then you will have a good idea of the actual landing position.

If you’re both lucky and good, you will even continue to get positions after the landing. Usually though the signal will stop as soon as the flight disappears behind a hill, or just lands too far away. The signal will then drop off to nothing very quickly. Your primary aim now is to get close enough (usually within 1 mile, perhaps closer) to regain contact. Tap the last known position into your car sat nav, or into mapping on your phone or tablet, and follow the directions. It’s worthwhile unplugging the audio cable from the scanner at this point, and turning the volume up, as usually you’ll be able to hear the signal before you can see it on the tablet waterfall display.

Once you’re close enough, wait for the scanner to decode the final position, then tap that into your satnav. Ideally, if you have offline Ordnance Survey mapping (e.g. Backcountry Navigator) on your phone or tablet, or you have online mapping (Bing Maps is best as it has an Ordnance Survey option) with a 3G signal, then use that. The reason for using OS maps is that they will show public footpaths etc. so you can plan your route on foot.

Remember to ask for permission to enter private land if at all possible.

If the payload lands in a field, walk around the edge of the field to minimize damage to crops, and follow tractor lines where possible.

Finally, remember to call back to base to let them know that the payload has been recovered! They will probably already know if you were uploading the tracker position throughout (it will have started to walk back to the chase car!) but they’d probably like to hear confirmation anyway!