Windsond sounding guide

This illustrated guide shows the practical aspects of performing a Windsond sounding. For more details, see the product manual.

1. Receiver set up

Find a good location for soundings, away from trees and buildings that can block the radio signal. Start the ground station laptop, connect the receiver and start the Windsond application. Connect the receiver with the car roof antenna (don't overtighten). Place the antenna in the center of the roof of the car for best reception. Don't pinch the antenna cable in the car door.

2. Sonde setup

Take out the styrofoam sonde from the protective brown tube. Straighten the antenna so it is pointing straight down. Make sure the sensor arm with silver-colored shielding is pointing upwards at roughly 45 degrees. Make sure the thread is not tangled or jammed in the lid. If the battery was pre-charged and inserted, just toggle the switch to the left to activate the sonde.

The sonde will now search for the receiver and a GPS signal. Allow the sonde a clear view of the sky to get a GPS fix within 0.5-2 minutes. In the meantime, the balloon can be prepared. Keep the sonde out of direct sunshine to avoid the initial temperature readings from being skewed.

Reusable sondes: The sonde will blink once and emit two deep tones. It will continue to emit a deep tone until ready to be released, when it changes to two high-pitch tones.

Non-reusable sondes: The sonde will blink once, and blink once again when ready for release.

3. Balloon setup

Make sure the canister is in a stable position and the balloon has a snug fit over the nozzle of the canister. Fill the balloon with helium at a controlled speed, holding the balloon in place during the process. Make sure no helium seeps out.
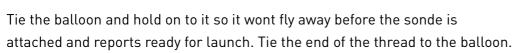
Examples of rise speeds for different balloons and gas contents:

Balloon weight (g)	Diameter (cm)	Circumference (cm)	Volume (liters)	Rise speed (m/s)	Recommended for
9	40	123	30	2	< 5 000 m
17	54	143	83	2	5000 – 8000 m

Tip: A pre-tied loop of string can be used to measure the circumference, or the diameter can simply be estimated. The gas amount is not exact, but too much gas might cause the balloon to burst before reaching the target altitude and too little gas will decrease the rise speed, making the sonde drift far.

Tie the balloon and hold on to it so it wont fly away before the sonde is attached and reports ready for launch. Tie the end of the thread to the balloon.

4. Check the software

In the software, correct the ground elevation.

Reusable sondes: Choose an initial setting for peak altitude. (It is also possible to do this during the sounding.) Select the sonde behavior after landing.

The last thing to do before launch is checking the colored sub-system status panels on the "sonde status" tab of the computer software. When all the panels says "OK" you are free to release the sonde.

GPS OK Moving at 3	Thermometer OK -7.6 °C	Hygrometer OK 63 %	Radio link OK Reception	Cut-down OK 2x tested	Battery OK 4.07 V	Barometer OK 731.9 hPa

5. Release

Don't launch the sonde until it signals it is ready:

Reusable sondes: The sonde emits two high-pitch tones every few seconds.

Non-reusable sondes: The sonde blinks once.

Unwind the thread and let go of the balloon without causing a sudden yank of the sonde.

6. During flight

Ensure stable radio contact with the sonde by maintaining free line-of-sight

Sparv Embedded AB
Linköping, Sweden
Org. No. 556976-9218
VAT No. SE556976921801

info@sparvembedded.com
Tel. +46 (0)707 312608
sparvembedded.com

between the sonde and the receiver antenna.

Reusable sondes: check the predicted landing site and update the cut-down altitude if needed to pick a convenient landing location.

7. For reusable sondes: Recovery of sondes

When the sonde is falling, radio contact is eventually lost when the sonde loses line-of-sight behind obstacles on the ground. The predicted landing coordinate will be continuously updated until this point.

Google Earth, OziExplorer or a GPS device can be used to navigate to the landing site.

Radio contact will be re-established when the receiver comes within 100-500 meters of the sonde. If not already doing so, the sonde will start to blink and beep so it is easily spotted for recover. The sonde battery lasts from a few hours to a few days. The sonde can still be reused if recovered after running out of battery, though it will be harder to spot.

After sounding

- Make sure the helium canister is tightened so no helium is wasted
- Make sure the end of the sensor arm is not dirty, as that can impair future measurements
- Pack up the sonde, without squeezing or bending the sensor arms
- Recharge the battery
- Tie and wind up new thread to the sonde
- Take care of data files from the configured directory (by default "Windsond files")
- Don't forget any equipment

Enjoy!

Checklist before sounding

- ■ Helium canister (with helium!)
- ■ Sondes
- ■ Balloons
- ■ Receiver
- ■ Strings or cable ties to seal the balloons
- ■ Computer (fully charged)
  - ■ With Windsond software and license file installed
  - ■ With internet connection (for Google Earth) or cached maps
- ■ Batteries (fully charged)
  - ■ *Tip: Insert the batteries in the sondes before-hand*
- ■ Antenna
- ■ Clothing adapted to the weather