

Altitude in warm weather

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During the PWCA in Sopot, Bulgaria there was an incident with breaking the ceiling. During the briefing in the morning, the PWCA announced a maximum altitude of 2900m geometrical. It would be judged after the GPS altitude in the IGC file. More than 40 pilots flew higher than this altitude (several with more than 100m) but they pledged that they have been under 2900m according to their altimeter.

We have analyzed the flight data and found that actually the barometric altitude and the GPS geometrical altitude differ significantly. The reason is the layering of the atmosphere. In warm air, all barometric altimeters read significantly less altitude. The reason is, that warm air is lighter and less pressed than cold air. If you gain altitude the pressure difference is less and therefore the calculated altitude. For details see http://www.intersema.ch/site/technical/files/flytec_heightcorrection_german.pdf. We will add the english version of this document on our website www.flytec.ch shortly.

Flytec and Bräuniger instruments only show the barometric altitude at the moment. This comes from the older days where everyone in the air had only barometric altimeters. But we see a shift to geometric definitions, either in the sailplane maps and also in the CTR files where some altitudes are geometric other in flight levels. We discuss this topic since longer time, and we are on the way to change our altimeter display. The pilot should be able to choose between barometric altitude if he is in controlled airspace and GPS altitude if he is in free air. As you may know we are also on the way to implement FLARM in our instruments. In the FLARM system it is mandatory to have all altitudes in geometric altitudes. Unfortunately GPS Altitude is less accurate than the X/Y accuracy, and it can have jumps. We discussed with the FLARM people that we will combine both information. The GPS altitude gives the long term geometric altitude, the barometric altitude the short term changes. The pilot will be able to choose which method he will use.

To overcome the actual problem, we will add instantly a new userfield "Alt GPS", so that both information is visible in the display. We can add that for the Flytec 6020/6030 and for the Bräuniger IQ-Compeo+/Competino+. The older instruments will also be updated but this will take 2 or 3 weeks.