## Calculation of minimum usable FL: True Altitude to Pressure Altitude (TA ⇒ PA)

Question: A mountain peak in the area is 4600 feet high. QNH in the area is 1030. ISA deviation is +14° C. What should the altimeter read for us to safely clear the mountain?

1. Adding safety margin.
   For obstacles ≤ 6000 feet: add 1000 feet.
   For obstacles > 6000 feet: add 2000 feet.

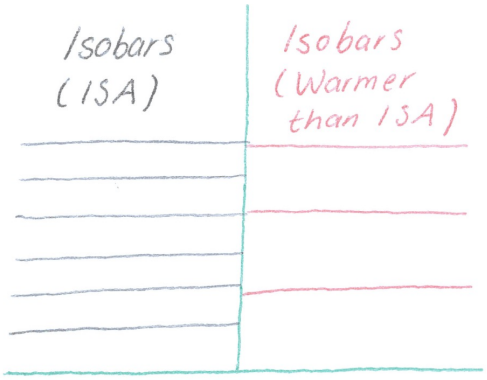
   4600 + 1000 = 5600 feet

2. Temperature correction. Use 1% per every 2.5° C difference from ISA.

   ISA deviation is given as +14° C

   14 / 2,5 = 5,6%

   Warmer air gives isobars further apart. Since the spacing between the isobars will be greater than in ISA, the true altitude will be greater than the indicated altitude. To fly at the same true altitude, we therefor need to fly at a *lower* indicated altitude.




   When converting from true altitude to pressure altitude, we use division instead of multiplication.

   5600 / 1,056 = 5303 feet.

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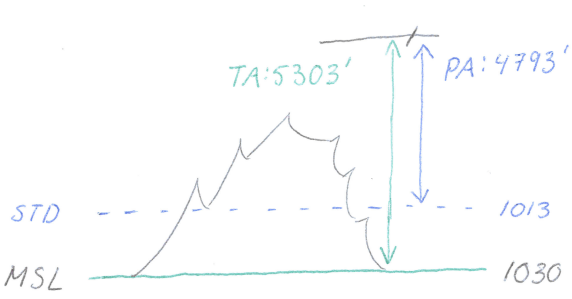
3. Pressure correction. Use 30 feet per hPa from standard.




In this case, the QNH is higher than standard. This means that the standard reference (Q1013) is located above MSL. Since we will fly with 1013 as the reference, we can allow the altimeter to indicate a *lower* value, since the actual pressure on the ground is 1030 hPa.

We have to subtract the difference between actual QNH and standard.

1030 – 1013 = 17
17 x 30 = 510

5303 – 510 = 4793 feet