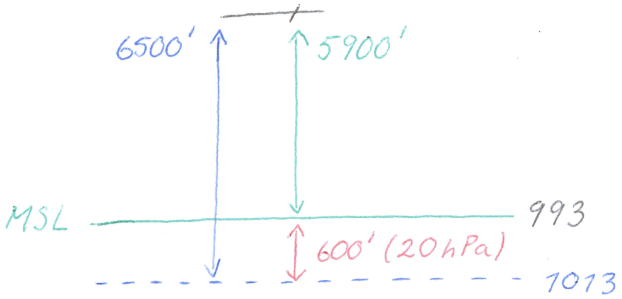
Calculation of minimum usable FL: Pressure Altitude to True Altitude (PA ⇒ TA)

Question: We are flying at FL65. QNH in the area is 993 and OAT +7° C. What is our true altitude?

1. Pressure correction. Use 30 feet per hPa from standard.
   1013 – 993 = 20 hPa
   20 x 30 = 600 feet

   In this case, the QNH is lower than standard. This means that the standard reference (Q1013) is located below MSL. We need to subtract 600 feet since this column of air does not exist.

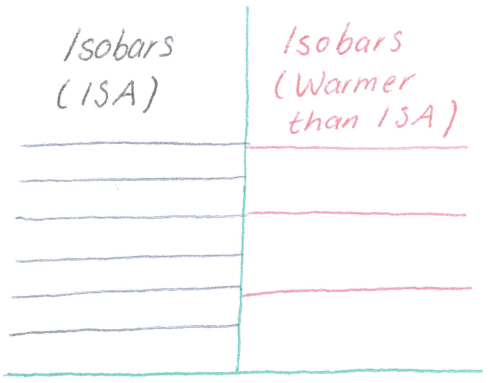
   

   6500 – 600 = 5900 feet

2. Temperature correction. Use 1% per every 2.5° C difference from ISA.
   Calculate ISA deviation at the current flight level.
   15 – (6,5 x 2) = +2° C
   Actual OAT is +7° C
   ISA deviation is therefore +5° C

   5 / 2,5 = 2%.

   Warmer air gives isobars further apart. Since the spacing between the isobars will be greater than in ISA, true altitude will be higher.

   5900 x 1.02 = 6018 feet.

   Answer: True altitude with the given conditions is 6018 feet.