Aim	• To enter and fly the published BIA hold to IR test standards	Airmanship	• Current charts, check Weather and Wind aloft, S-I-D, time-turn-talk	Performance	• Establish inbound track within 5° for 30s, +/- 5kts, +/- 100'

Estimating the wind and wind components at altitude

• Refer to the Met Office Form 214 (Low Level Spot Wind) forecast appropriate to the time of flight
• The 50N 0230W box is the best one to use for the EGHH area
• Interpolate for the likely holding level, eg. 4000'

```
       50N 0230W
    24   350 40   -33
    18   340 40   -21
    10   340 30   -05
    05   320 25   +05
    02   290 10   +11
    01   280 10   +13
```

• In this example, 4000' is 2/3rds of the way from the "02" to the "05" forecast levels. So we estimate:
  - *wind direction = 2/3rds(320-290) + 290 = 20 + 290 = 310°*
  - *wind speed = 2/3rds(25-10) + 10 = 10 + 10 = 20kts*
• Hence, estimated wind is **310/20**

Estimating Drift and Head/Tail Wind Component
• We use the 1-in-60 rule, in the form of: Max Drift angle = $\dfrac{\text{Wind Speed} * 60}{\text{TAS}}$

• In this example, using 120KTAS as the holding speed, the Max Drift is
  (20kts wind speed * 60) / 120KTAS = 10°

• We use a simple rule of thumb to factor the max drift and wind speed for the angle between the aircraft track and the wind:
• In this example, the wind is at ~50° to the desired track, so we use 0.8x
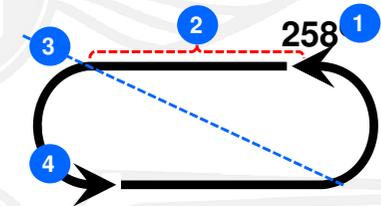
• Hence,
    Drift = 0.8 * 10° = ~8°
    Headwind = 0.8 * 20kts = ~**15kts**
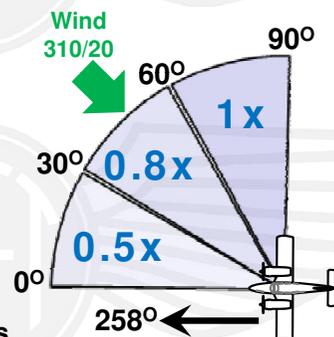
Applying corrections to the still-air BIA hold procedure

There are 4 adjustments we can make to the hold:
1. Apply Drift to the Outbound heading
2. Adjust the Outbound timing
3. Adjust the Gate angle
4. Hold an intercept during the Inbound turn

1. Apply Drift to the Outbound heading
We may use 3x the estimated Drift on the outbound leg, to account for the effects of drift during the 2 turns and the leg itself. However, the actual drift experienced will reduce as the correction brings us closer to the wind direction. In this case, 3x 8° drift gives a heading of 258 + 24 = 282. We may chose to apply 2.5x drift instead, for an **Outbound Heading** of **278**.
There is no particular formula, we just estimate a suitable correction between 2x and 3x drift. With a more northerly wind, we might use 3x; with a more westerly one, 2x drift

2. Adjust the Outbound timing
We can add 1.5s to the timing for every knot of headwind component, so our **Outbound time** = 60s + 1.5 x 15kts = **1min 23s**
After we first pass the beacon on the inbound track (ie. not an Entry track), we can time how long it takes to reach the Abeam position. In still air, this will be 60s. The actual time thus measured can be used for our Outbound timing, since it will accurately reflect the effect of wind on a notional 60s leg.

3. Adjust the Gate angle
With a northerly wind component, even if we turn inbound from exactly the right position on the 30° gate, our Rate 1 turn will be elongated southwards beyond the Inbound track. We can't tighten the turn, so instead we adjust the gate to the north by a Single Drift angle of 8°. The **Gate QDR** becomes 288° + 8° = **296°.**
Combined with the longer timing, this should mean that we start our Inbound turn north of the actual hold pattern, allowing us to roll-out from the elongated turn on the inbound track

4. Hold an intercept during the Inbound turn
During the inbound turn, we monitor the RMI to assess progress. Our only option for adjustment during this turn is to hold an intercept heading, eg. rolling wings level with 30° to go. This is most likely in the case of a Southerly wind squashing the turn, but it may be needed when flying this example if we have over-corrected for drift