

## PILOTS CORNER

**Cautionary:** Unfortunately, the following will only make sense to pilots; so to avoid the inevitable confusion of a 'scrambled head' **'please don't proceed'** as it has nothing to do with either the *unTeaching* or *the Heart of AND*.

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During flight in zero wind conditions, the heading (or flight path of an aircraft relative to the air mass that it is flying through) is identical to its actual track made good over the earth's surface. However, in the presence of wind (i.e., movement of the air mass over the earth's surface) the direction in which the nose is pointing (i.e. its 'heading') will differ from the track made good over

the ground. Similarly in still air its speed relative to the air mass (i.e. its **Tas** or 'true airspeed') will be identical to its speed over the ground (referred to as 'ground-speed'). With a wind coming from the left of the aircraft's flight path, the aircraft's track made good over the ground will be deflected to the right and will no longer accord with the heading: The difference between track and heading is referred to as *drift*. Similarly, when flying into a headwind, while its speed (*true airspeed*) through the air mass remains constant, its (*ground speed*) will have been reduced: Clearly the reverse holds true for a tailwind. The difference in speeds and directions are simply a matter of 'viewpoint' – either that from the flight deck (heading and airspeed) or that from the Earth (track and ground speed).

Before the advent of *electronic* navigation instruments, the manual Jeppesen E6B flight computer was used by both pilots and navigators. It had two sides; the one side used for *flying* calculations and the flip side used for *navigating* (as it gave a graphical resolution of the 6 variables associated with the triangle of velocities, viz track, ground speed, heading, airspeed, wind direction and wind speed). Given any 4 of these elements, the remaining 2 could be calculated. The 'Index' was a mark at the top of the circle while the 'grommet' refers to the centre of the circle.

### **Aviation acronyms:**

Two acronyms were used by the C.A.A. in the training of commercial pilots; one pertaining to the aircraft's *flight performance* and the other to the *navigational requirements* relating to the flight.

### **When FLYING:**

Whenever a pilot wishes to change altitude whether to descend or to climb, the sequence of actions required is to...

- P** - first select the appropriate **Power** setting; increasing it when wishing to climb or throttling back when choosing to descend (or coming in to land),
- A** - then to select the appropriate **Attitude** (nose up or nose down) when climbing to a higher flight level or to descend to a lower one respectively, and finally
- T** - to **Trim** (or remove) any excess aerodynamic loads on the control column (resulting from such changed power settings) with the use of the Trim tab.

### **When NAVIGATING:**

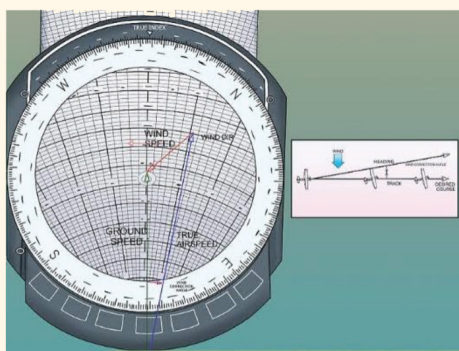
The 3 vectors that form the basis of navigation are Wind speed (and wind direction), True airspeed (and Heading) and Ground speed (and Track).



Prior to the dawn of electronic navigation instruments or flight directors, it was compulsory for all commercial flights to carry a navigator. For smaller aircraft which had no space for a dedicated navigator, the commercial pilot had to take on the twin responsibilities of both flying & navigating. Data related to aircraft navigation was resolved by using a Jeppesen E-6B mechanical computer (see below)...

Flight director (in aviation's digital era)

Whenever the navigator/pilot wished to establish the aircraft's position, track made good or heading to steer, the following acronym was used in order to arrive at an ETA for the destination field...



Mechanical flight computer (analogue era)

- H** – place the Heading under the index, then  
**A** – the wind will blow Away from the grommet if  
**T** – Tas (true air-speed) is put under the centre,  
 \_\_\_\_\_ or \_\_\_\_\_  
**T** – With the Track places under the index, then  
**I** } – the wind will blow IN towards the grommet if  
**N** }  
**G** – Groundspeed has been put under the centre.  
 \_\_\_\_\_ and finally \_\_\_\_\_  
**H** – Have you checked (for a 'mongrel\* vector ?

\*A 'mongrel' vector is the result of incorrect 'vector pairing'. The 2 most common mistakes being to pair the intended Track with the aircraft's Tas, or the Heading of the aircraft with its Groundspeed - either of which could result in undesirable consequences.

PS: In this acronym, 'grommet' & 'centre' are synonymous.

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