Hangar Night

Thursday September 22nd, 2022

Objective:

- Teach our youth the basics of how to plan a flight.
- Review the wind triangle.
- Explain terminology - course, heading, track, drift angle, WCA, ground speed.
- Explain the steps required to plan a flight.
- Avoid becoming a child of the magenta line!

Materials:

- E-6B flight computer
- Navigation Log worksheet (*Yes, I know - "there's an app for that"*)
- Sectional charts
- Pilots Handbook of Aeronautical Knowledge
- Airport/Facility Directory (Now *Chart Supplement*)
- Aircraft Operating Handbook

The term "children of the magenta" traces to 1997, when American Airlines captain Warren Vanderburgh said the industry has made pilots too dependent on monitoring the magenta lines on the machines that are really flying the plane. (Source IEEE Security & Privacy Children of the Magenta Sept.-Oct. 2015, pp. 104-104, vol. 13) link

No matter what you fly, regardless of how high or how fast, the basics matter.

From the Pilots Handbook of Aeronautical Knowledge:

Air navigation is the process of piloting an aircraft from one geographic position to another while monitoring one's position as the flight progresses.

It introduces the need for planning, which includes plotting the course on an aeronautical chart, selecting checkpoints, measuring distances, obtaining pertinent weather information, and computing flight time, headings, and fuel requirements.

The methods used in this chapter include pilotage—navigating by reference to visible landmarks, dead reckoning—computations of direction and distance from a known position, and radio navigation—by use of radio aids.

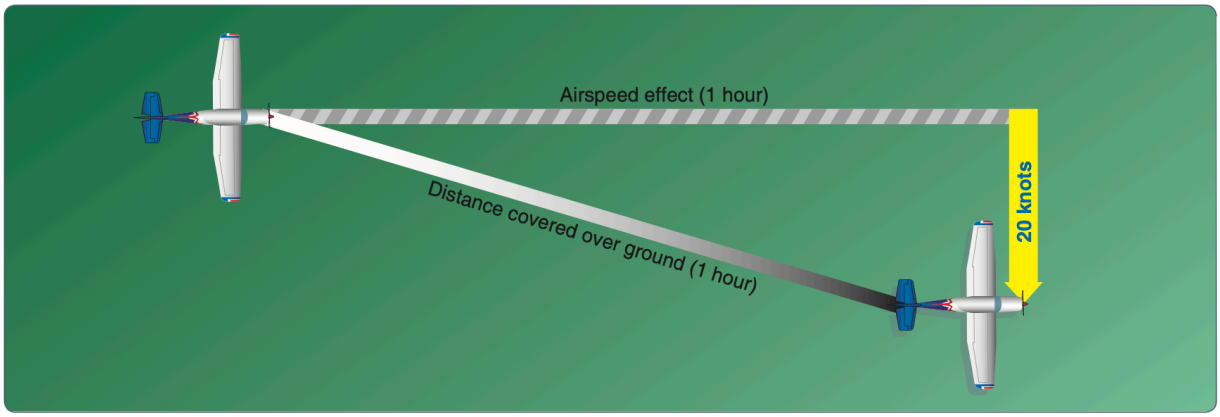


Figure 16-14. *Aircraft flight path resulting from its airspeed and direction and the wind speed and direction.*

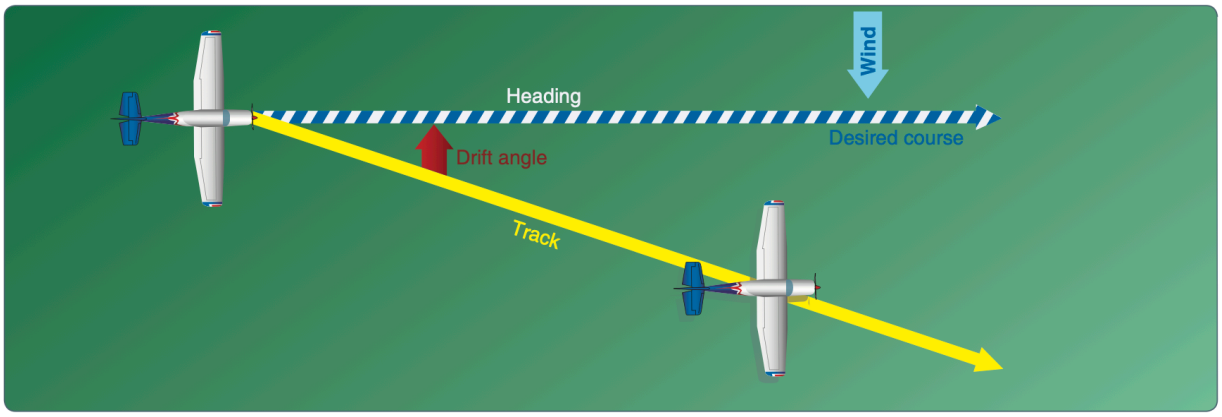


Figure 16-15. *Effects of wind drift on maintaining desired course.*

Pilots Handbook of Aeronautical Knowledge Page 16-5 through 16-20

TC ± WCA = TH ± V = MH ± D = CH (page 16-20)

TC - True Course

WCA - Wind Correction Angle

TH - True Heading

V - Magnetic Variation

MH - Magnetic Heading

D - Magnetic Deviation

CH - Compass Heading

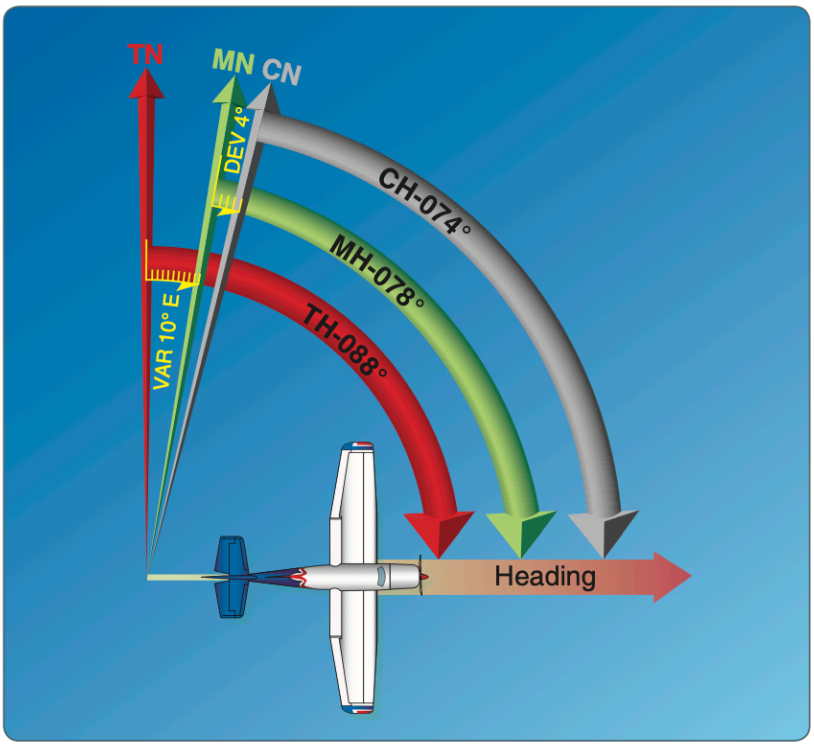


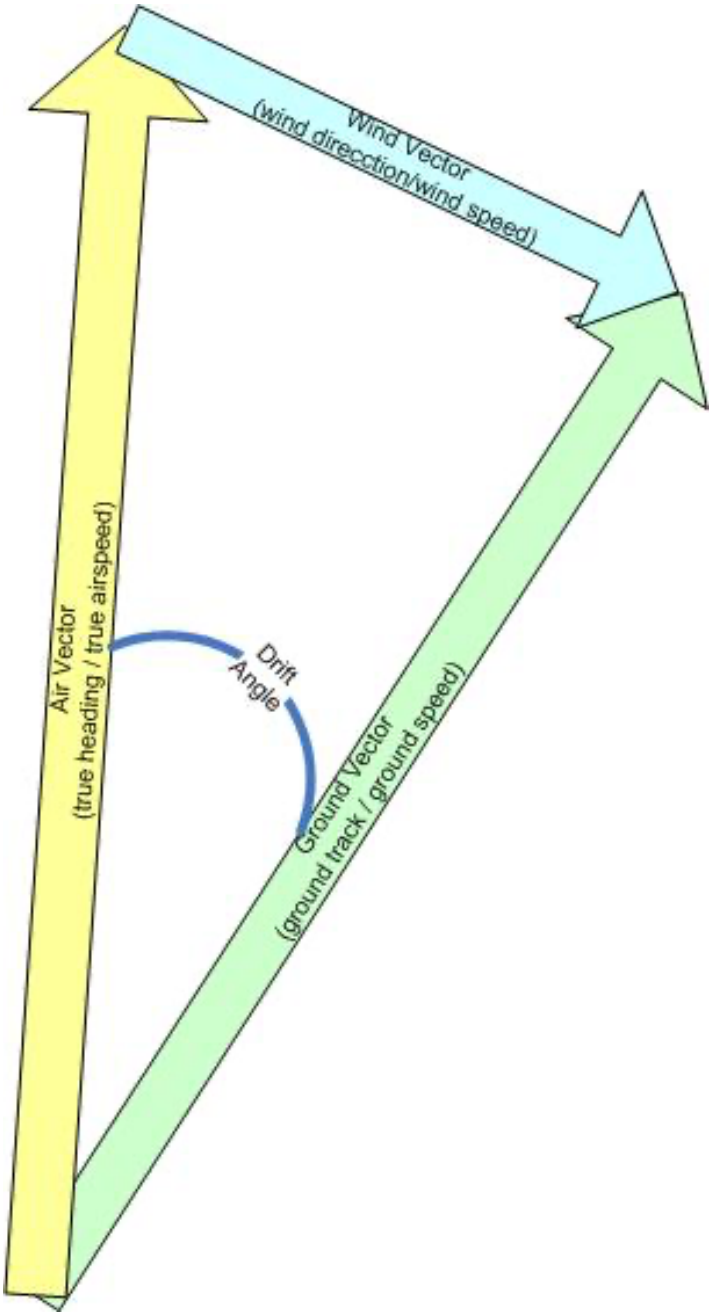
Figure 16-16. *Relationship between true, magnetic, and compass headings for a particular instance.*

- Course—intended path of an aircraft over the ground or the direction of a line drawn on a chart representing the intended aircraft path, expressed as the angle measured from a specific reference datum clockwise from 0° through 360° to the line.
- Heading—direction in which the nose of the aircraft points during flight.
- Track—actual path made over the ground in flight. (If proper correction has been made for the wind, track and course are identical.)
- Drift angle—angle between heading and track.
- WCA—correction applied to the course to establish a heading so that track coincides with course.
- Airspeed—rate of the aircraft's progress through the air.
- Ground Speed (GS)—rate of the aircraft's inflight progress over the ground.

Quoting Wikipedia, “The wind triangle is a vector diagram, with three vectors.

The **air vector** (shown in yellow) represents the motion of the aircraft through the airmass. It is described by true airspeed and true heading.

The **wind vector** (shown in blue) represents the motion of the airmass over the ground. It is described by wind speed and the inverse of wind direction. Note that by convention wind direction is given as the direction



the wind is from. In a vector diagram such as the wind triangle, wind direction must be stated as the direction the wind is blowing to, or 180 degrees different from the convention.

The **ground vector** (shown in green) represents the motion of the aircraft over the ground. It is described by ground track and ground speed. The ground vector is the resultant of algebraically adding the air vector and the wind vector."