



The Compass

**A guide to magnetic variation
and deviation**

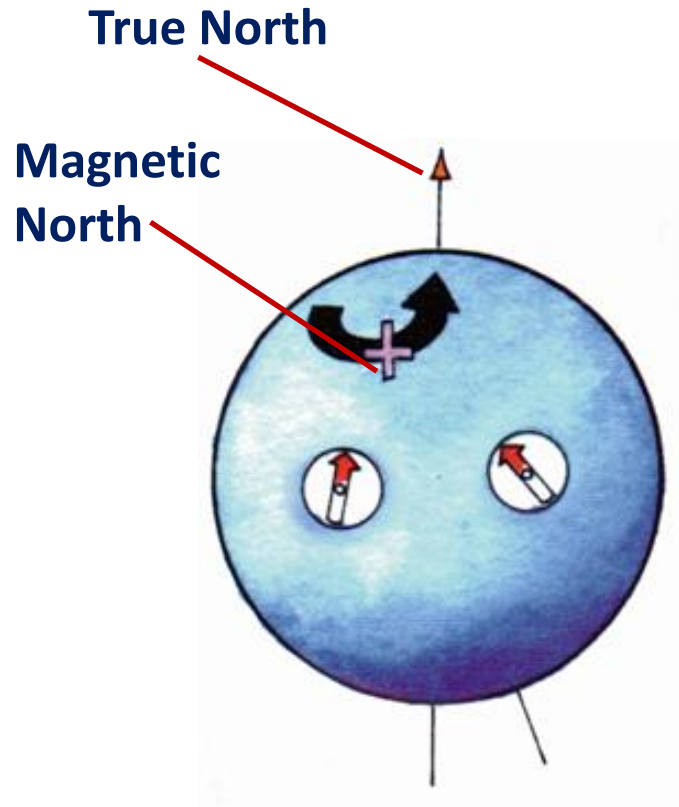
Introduction

This presentation explains the difference between magnetic and true bearings and the causes of variation and deviation



Magnetic Variation

True North & Magnetic North



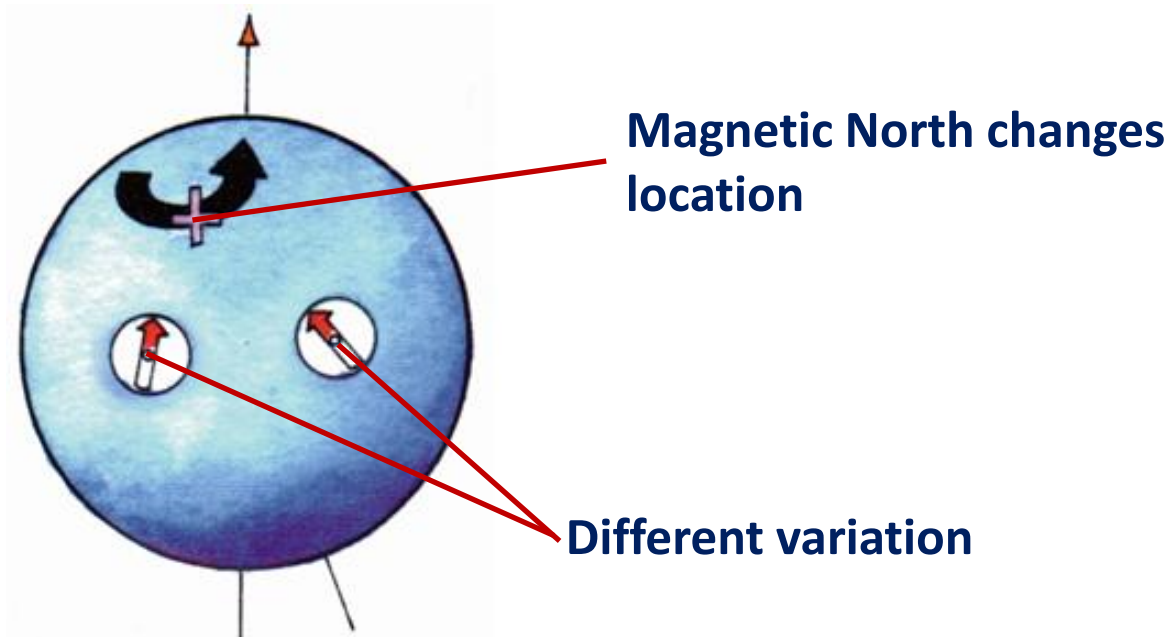
Charts show North as True (geographic) North...

...a compass will point to magnetic North

The difference between the two is called variation

Magnetic Variation

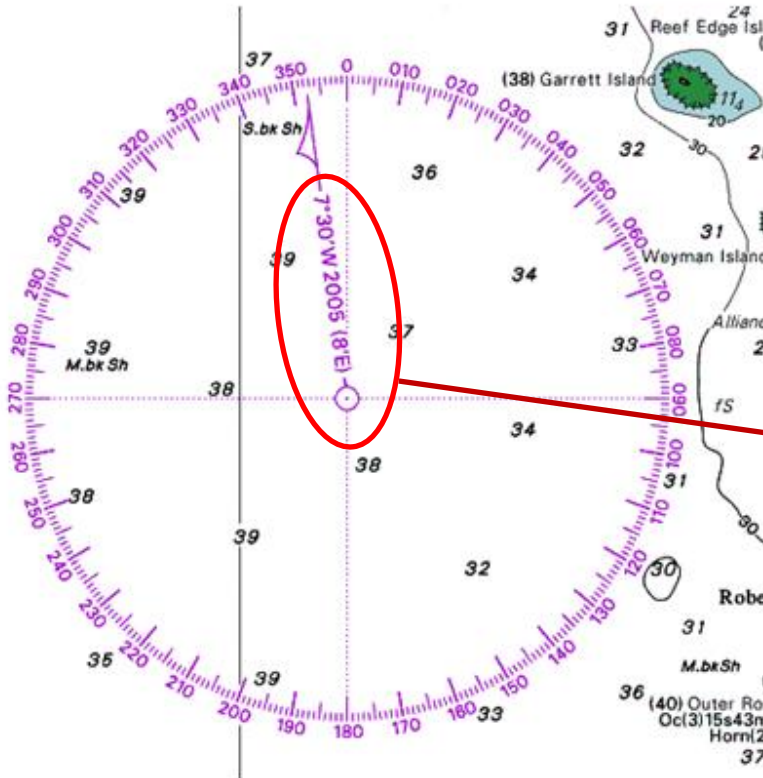
Variation changes according to your position



The position of Magnetic North changes slowly at a steady rate

Variation on the Chart

Variation is shown within the compass rose

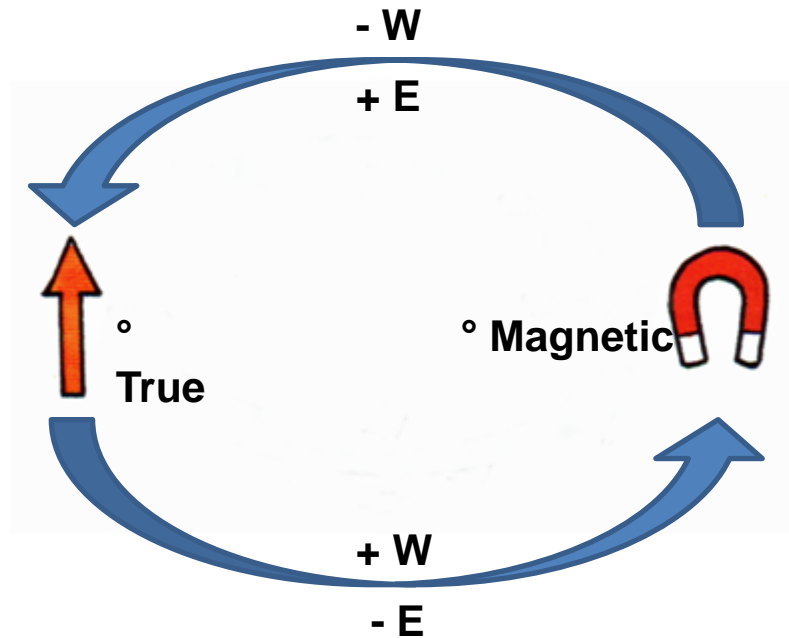


Here, the variation is reducing by a few minutes each year

Changing by 8' annually

Applying Variation

Bearings on a chart must be drawn in ° True...

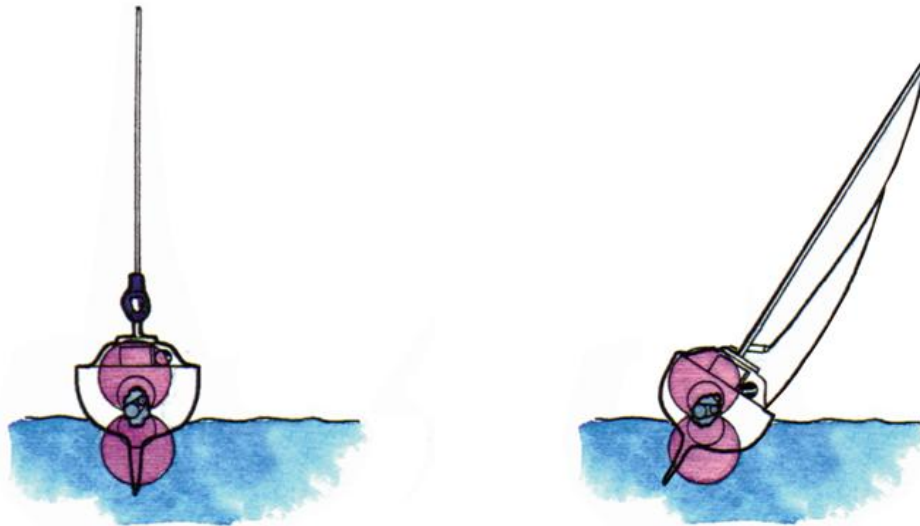


...so you must apply variation to bearings from and to the chart

Compass Deviation

Causes of deviation

Ferrous metal and magnetic fields will affect the compass.....

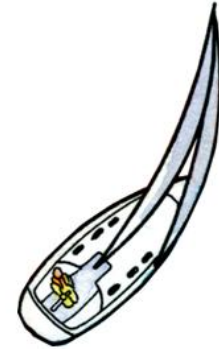


...engine, instruments, cockpit speakers and mobile phones

Also as the boat heels the influences may change.....

Compass Deviation

Headings

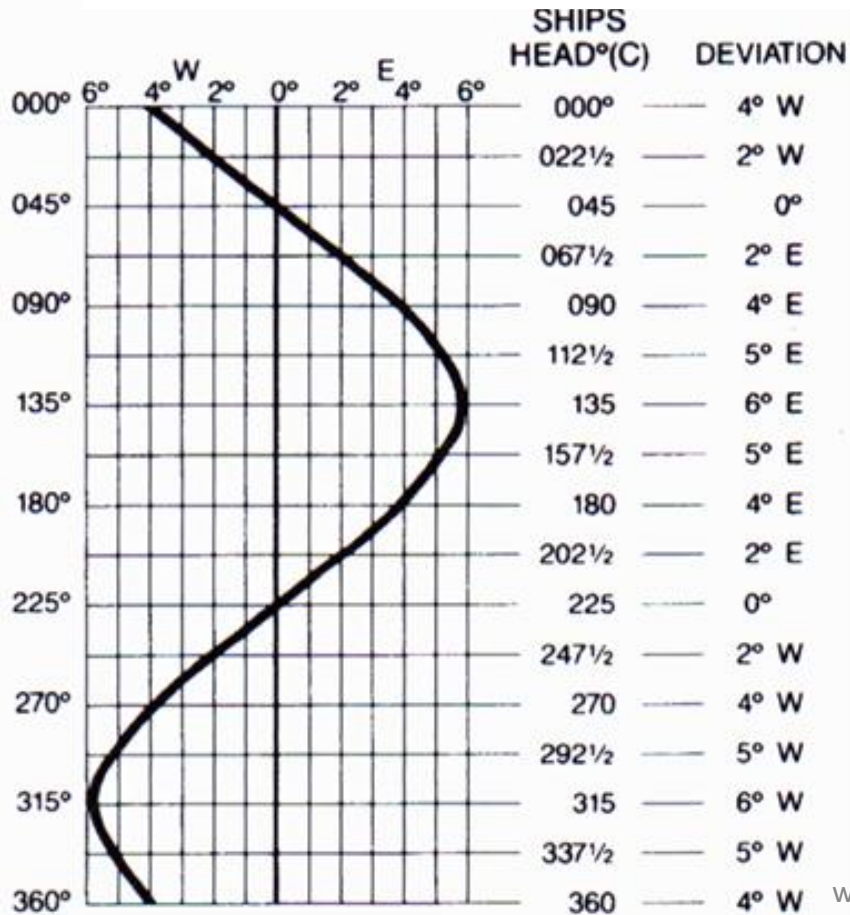


The magnetic influences on board will vary as the boat's heading changes

Deviation Card

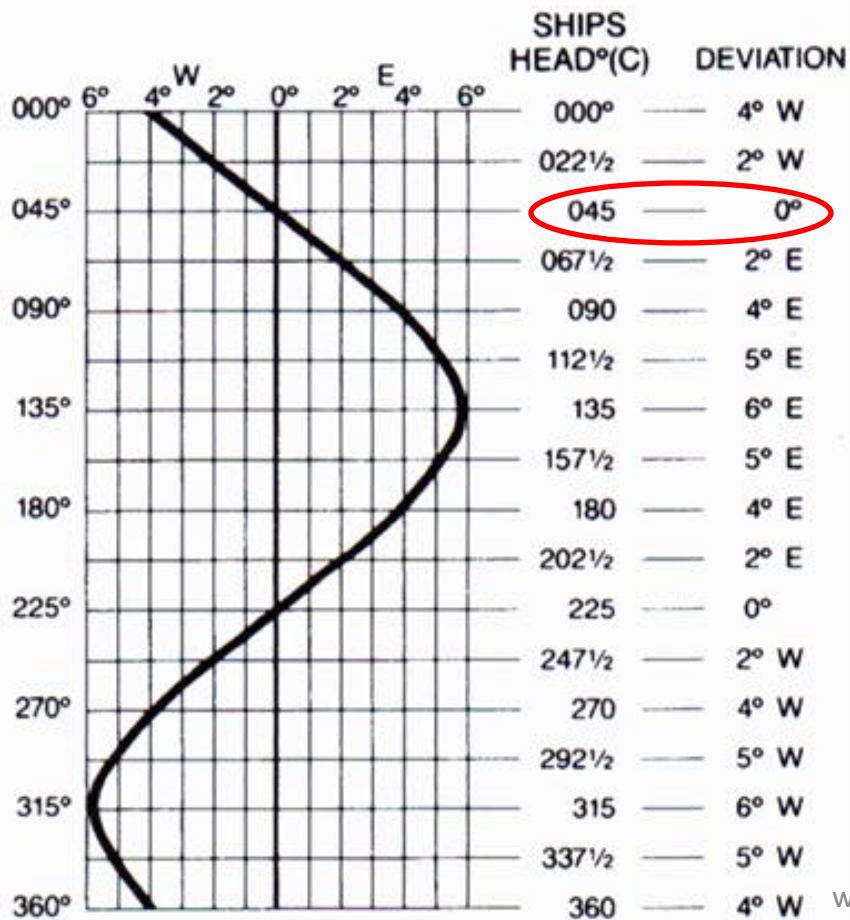
A deviation card can be produced for the steering compass

....which will show the East or West error on various headings



Deviation Card

For example, a vessel for which this compass card has been produced...

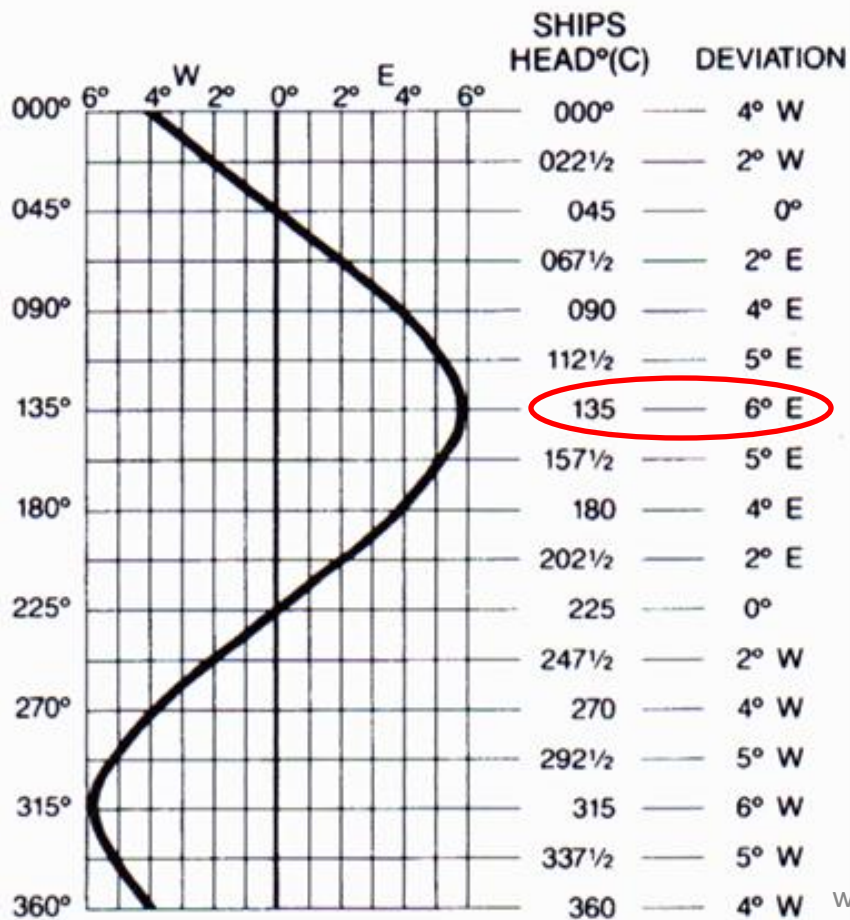


...on a heading of 045°(C

...would have 0° deviation



Deviation Card



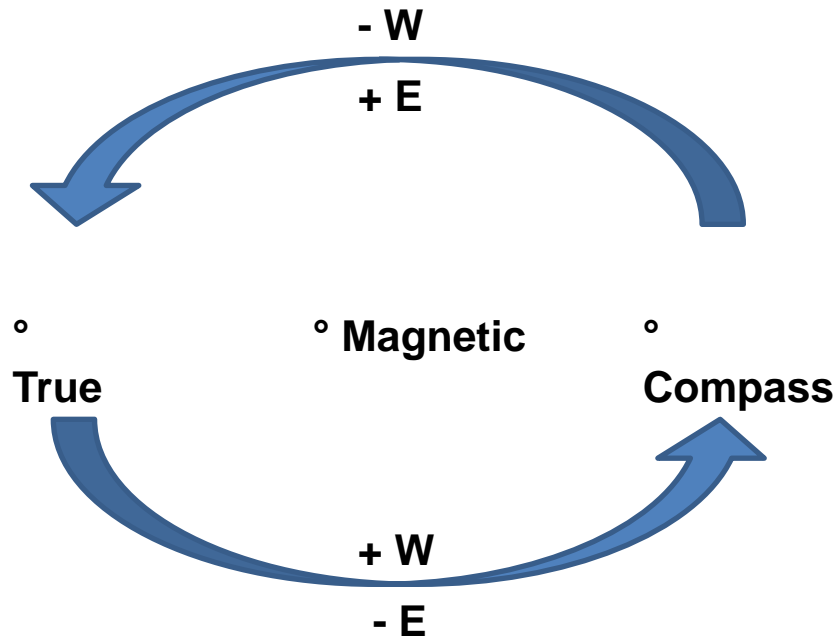
While a heading of 135°(C)

...would give 6° East deviation



Applying Deviation

Deviation is applied in a similar manner to variation

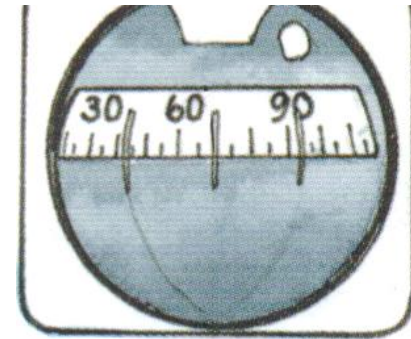


Checking for Deviation

A useful way of checking for deviation is to align the boat along a transit



With the true bearing along the transit noted and local variation taken into account



A difference between magnetic and compass will be deviation

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Further Reading



We highly recommend Tim Bartlett's
RYA Navigation Handbook (G6)

You can buy a copy of this book by visiting our on-line shop

www.penguinsailing.com