

7. Relative Bearings

Common Examples

direction of another ship, landmark, island, as 'dead-ahead' or "broad on the port beam" or "two points on the port bow" or "three points abaft the starboard beam" (in old compasses 1 point = 11.5°)
reference is the bow (head) of the ship

A relative bearing is a bearing relative to the head of the ship

As all plotting is done in true, you may hear the term Ship's Head True (SHT).

The 360° Form

Bearings measured from 000° at the boat's bow, clockwise to 180° at the stern, then continue around in a full circle to 360° (000°) at the bow.

Port or Starboard Form

boat surrounded by two semi-circles, each measured from 000° dead ahead to 180° at the stern in either a port or starboard direction.

For some this method is easier to visualize 45° on the port bow than ' 315° relative

alternatively 45° on the port bow is 'red 45° '

35° to starboard is 'green 35° '

Converting Relative Bearings

A relative bearing must be converted to true before plotting

Add the value of the relative bearing to the boat's true heading at the time the magnetic bearing is taken.

Example 1

A boat is on a heading (**A**) of 170° true and a relative bearing (**B**) of 060° is taken (see Figure 7.2).

True heading	=	170°
Relative bearing	=	$+ 060^\circ$
True bearing	=	230°

Example 2

A boat is on a heading (**A**) of 320° true, and a relative bearing (**B**) of 210° is taken (see Figure 7.3).

True heading	=	320°
Relative bearing	=	$+ 210^\circ$
True bearing	=	530°
		$- 360^\circ$
True bearing	=	170°

The formula may be stated: **TB = TH + RB** (true bearing = true heading + relative bearing).

A port relative bearing is converted to a true bearing by subtracting the port relative bearing from the heading. **TB = TH - Port RB**

Using a Hand Bearing Compass

Calculate the difference between the observation and the boat's magnetic heading (RB = MB · MH).

Procedure:

Take a bearing on the bow to obtain the **boat's magnetic heading**.
Do not use the ship's compass which will give you a compass heading.
Immediately take a bearing on an object.
Record the time and value of both observations in the navigator's workbook.
Calculate the difference between them to obtain the relative bearing.

Example 1:

Magnetic heading	= 129°
Bearing on object	= 053°
Relative bearing	= 129° - 053° = 076°

Example 2:

Magnetic heading	= 323°
Bearing on object	= 032°
Relative bearing	= 032° - 323°

A **relative bearing cannot be a negative number**, convert 032° to (360° + 032°) = 392°

Relative bearing = 392° - 323° = 069°

Using A Pelorus

'dumb compass' to take relative bearings,
purely mechanical
only one moving part

Tape Marks

Establish a precise position from which bearing observations will be made.
With tape mark the deck or rail for port relative and starboard relative 45° and 90°
All must be easily visible from the helm
Must be a mark defining ship's head from the steering position