

Vesdoc.com - radar plot

OWN VESSEL · Name: _____ Date: _____

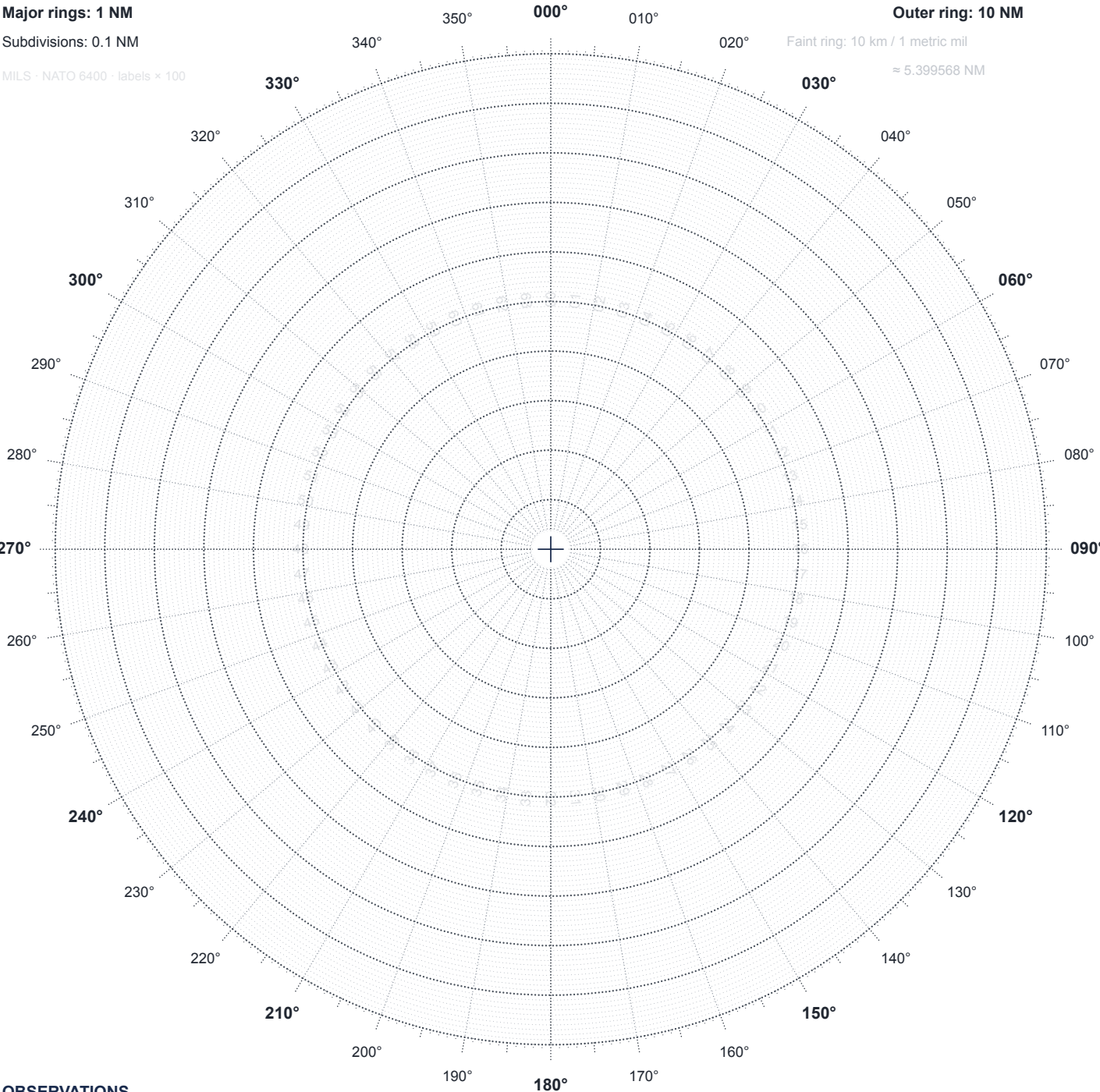
Course: _____ ° Speed: _____ kn Heading: _____ °

Reference: ☐ ground ☐ water Time zone: _____

OBSERVED OBJECT

Target / ID: _____

Bearing: ☐ true ☐ relative



OBSERVATIONS

No.	Time	Bearing ° / mil	Range NM	Notes / changes in own course or speed
1				
2				
3				
4				

CPA: _____ NM TCPA: _____ min Time at closest approach: _____

Target course: _____ ° Speed: _____ kn Reference: _____

6 MIN: $v = 10 \times d$ $d = v / 10$

v in kn · d in NM · worksheet on page 2 · print at 100% / actual size



Calculations and six-minute plotting

Vessel: _____ Date: _____ Target / ID: _____

1 • OWN VESSEL — own speed and distance travelled

Own course: _____ ° Own speed v: _____ kn Reference: ☐ ground ☐ water

Time Δt : _____ min Own distance $d = v \times \Delta t / 60 =$ _____ NM

Over 6 min: $d = v / 10$. Example: 12 kn gives 1.2 NM in six minutes.

2 • OBSERVATION TIMES AND INTERVAL

First observation t_1 : _____ Second observation t_2 : _____

$\Delta t = t_2 - t_1 =$ _____ min Next reading at: _____

Suggested series: t_0 , $t_0 + 3$ min, $t_0 + 6$ min. The middle point checks the movement line.

Use the actual time interval. Include the date across midnight; keep the same time zone.

3 • RELATIVE MOTION — between two plots of the same object

Distance between plot points d_r : _____ NM Δt : _____ min

Relative speed $v_r = 60 \times d_r / \Delta t =$ _____ kn

At exactly 6 min: $v_r = 10 \times d_r$. Example: 1.8 NM between the points gives 18 kn.

Measure the entire line segment between the points, not just the change in radar range.

This is relative speed. Finding the target's true speed also requires your vessel's motion.

4 • CLOSEST APPROACH — CPA AND TCPA

CPA = shortest distance from the centre to the relative movement line: _____ NM

Distance along the line from the latest plot to the CPA point s: _____ NM

TCPA = $60 \times s / v_r =$ _____ min Time at CPA = latest observation + TCPA: _____

Example: $s = 3.0$ NM and $v_r = 18$ kn gives 10 min to closest approach.

Use the distance ahead in the direction of motion. If the point is behind the latest plot, closest approach has already occurred. At zero relative speed, the time is undefined.

5 • SPEED, TIME AND DISTANCE — BASIC CALCULATIONS

$d = v \times \Delta t / 60$ $v = 60 \times d / \Delta t$ $\Delta t = 60 \times d / v$

My calculation: _____

Result and unit: _____

SYMBOLS AND TERMS

d , d_r and s : distance in NM · v and v_r : speed in kn · Δt : time interval in minutes.

NM: nautical mile · kn: knots, NM per hour · heading: the direction the bow points.

CPA: closest point of approach (distance) · TCPA: time to closest point of approach.

Plotting and prediction assume unchanged motion. A new course or speed requires a new calculation interval. Convert each relative bearing using the heading at that time.

Method reference: NGA · Radar Navigation and Maneuvering Board Manual, chapter 6.