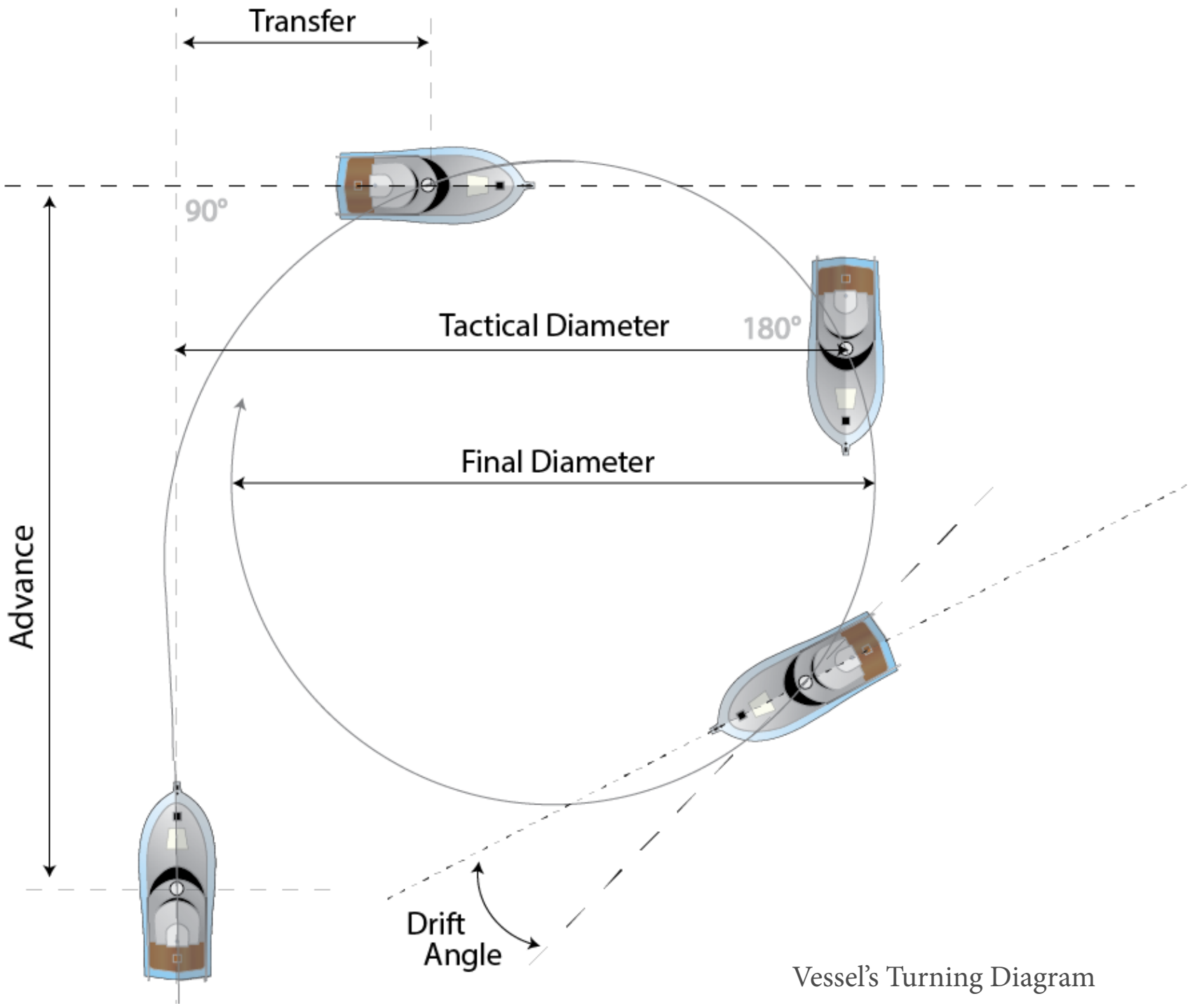
Deck Gen - Ship Handling - Advance Transfer



Vessel's Turning Diagram

Advance *- Distance the vessel will travel parallel to its original course after the rudder is turned.*
Transfer *- The distance a vessel moves horizontally at any point in the turn, measured 90° from the original course.*
Tactical Diameter *- The distance measured from the original course to the point where the vessel is 180° from its original heading.*
Final Diameter *- The diameter of the circle a vessel travels after making a 360° turn while maintaining the same speed and rudder angle, always less than tactical.*
Drift Angle *- The angle between the axis of a vessel and the tangent to its path.*

USCG Deck General Question 3936

You are conducting trials to determine the maneuvering characteristics of your vessel. While making a turn, you take ranges and bearings of an isolated light with the results as shown. Based on this information, what is the advance for a turn of 45°? Illustration D034DG

Advance - How far the vessel will travel forward parallel to its original course after the rudder is turned.

- 1 Read the entire question. Clarify what is being requested.
  The problem is requesting how the vessel will Advance when the heading is 45° from the original heading.

- 2 Reference Diagram D034DG. Make ready a maneuvering board and plotting tools.

- 3 Use the center of the maneuvering board as the reference point for which all of the Bearings & Distances are taken and the outer ring as 1.0 nautical mile. See page four of this explanation for the maneuvering board for this problem. See the video folder on the flash drive for a video on how to use a maneuvering board. A printable maneuvering board is available in the resources folder on the flash drive.

- 4 Choose to either plot all positions in Nautical Miles or Yards.
  Nautical Mile: Each ring equal .1 Nautical Mile. The yards would need to be converted using 2000 yards = 1 NM.

  Yards: Each ring equal 200 yards, therefore the outer ring is 2000 yards. The "dot" between each ring are 20 yards.

- 5 Plot the positions using True Bearings given as if from outer ring looking at the center.

(See maneuvering board plot and label points A, B, C, D, E as needed - page three and four of this explanation.)

- 6 Locate the ship's position when the heading is 45° from original course 228°T. (228° + 45° = 273°T) Near position E.

- 7 Measure the distance along the original course from B where the turn began and just before point E (Heading 275° T) to solve question.

Answer: 690 Yards

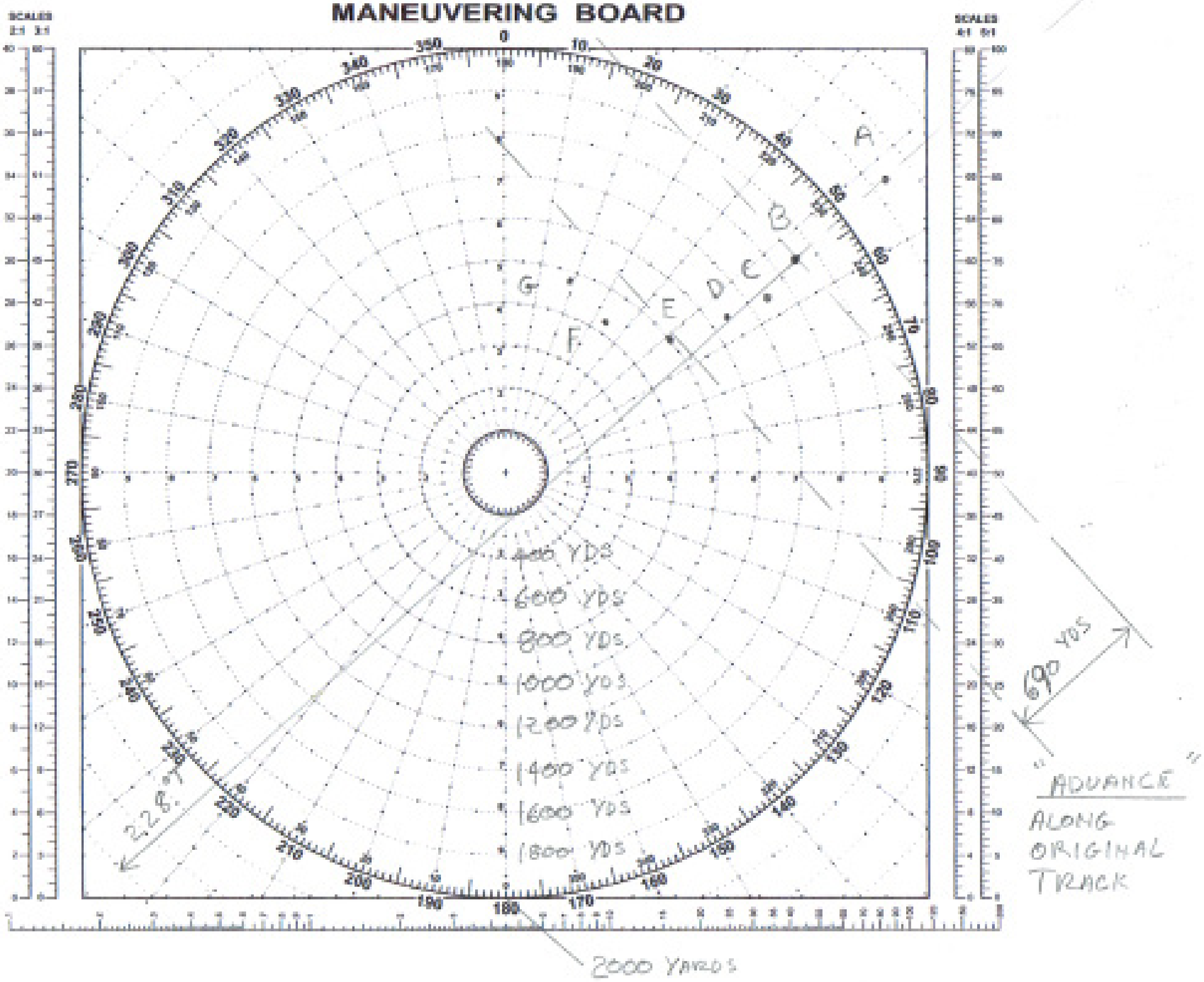
Note: Not all answers will be exact as per USCG solution; however, with careful plotting they will be close.

D034DG

	HEADING (TRUE)	BEARING (TRUE)	RANGE (YDS)	REMARKS
	228°			INITIAL HEADING
A.	228°	232°	2260	ON INITIAL COURSE
B.	228°	234°	1700	RIGHT FULL RUDDER ORDERED
C.	230°	236°	1490	
D.	252°	235°	1275	
E.	275°	231°	1000	
F.	316°	214°	850	
G.	352°	198°	975	
H.	022°	194°	1210	
I.	053°	197°	1430	
J.	087°	202°	1600	
K.	115°	209°	1690	
L.	151°	217°	1700	
M.	183°	225°	1600	
N.	218°	232°	1350	RUDDER AMIDSHIPS
O.	228°	235°	1125	STEADY ON 228°

USCG Illustration D034DG Labeled A-O.

QUESTION # 3936



B. POINT WHERE TURN BEGINS

E. HEADING

275°T

228°T
+ 45°T
273°T

USCG Book Deck Gen Question 3936 Maneuvering Board.