

1. Track inbound 292°; reverse course. New heading?
2. Landing runway 13. What is your heading (a) downwind and (b) on left base for 13?
3. ILS course outbound is 169°. Procedure turn to the left. First and second procedure turn headings are?
4. Heading is 096° to make good track of 080°. What heading is required to stay on track when you reverse course?
5. Heading is 025°. Turn 270° to the left. New heading?

You Should Know "ROSE"

by SHELBY M. KRITSER • AOPA 42277

*All navigation becomes
simpler when you learn
the compass rose
and how to use it*

If you can read the above five situations and give the correct answers in one minute without using a pencil or a computer, you already know the compass rose and you need not read further. If it takes you longer, you should learn the few simple steps that will help you get acquainted with this centuries-old device. (Check your answers on the next page.)

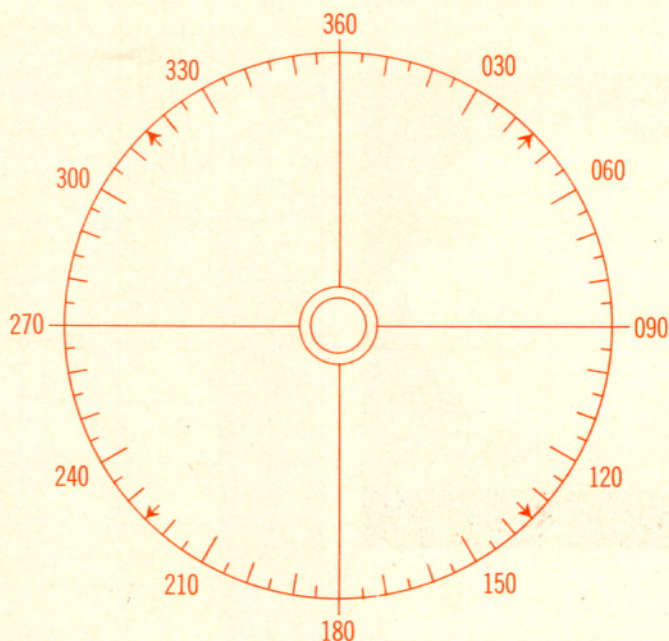
The compass rose is called many things—some unprintable as used by frustrated pilots. There were 16 points in the old mariner's compass and these were 22½° apart around the circle: North, NNE, NE, ENE, etc. These divisions weren't close enough for aerial navigation so a protractor scale of 360° for a full circle was adopted. Some call it a 360° azimuth, as opposed to 180° east or west of Greenwich (longitude) or 180° left or right (some old manual loops). We see it every day: the face of our ADF, the Kollsman Direction Indicator, course selector on our omni, magnetic compass, directional gyro, wind side of our computers, at least one-half of it on every plotter. It's on all aeronautical charts in one form or another.

Evidently, someone in Washington's Coast and Geodetic Survey liked it because they carefully placed it around every VOR station and aligned it with magnetic north.

To you, as a pilot, the important thing is to learn to visualize the Rose—study it, stare at it, curse it—then close your eyes and see how much you retain. You learn that 30° to the right of 090° is 120° in much the same manner that you know B is BRAVO or ··· is ROMEO.

The rose is used to define heading, track, bearing, azimuth, course, radial. Let's get in step with Air Traffic Control and start calling the rose's 360 little men by their right names . . . they all have three initials regardless of how small they are . . . 92° is not ninety-two degrees, it's zero nine two degrees and is written 092°; 274° is two seven four degrees; 2° is zero zero two degrees.

If you know the rose you generally know instantly where you're headed in case you would like to know or in the event some nosey controller should ask you. If your gyro reads 132°, you're southeast bound; 300°, northwest bound and so forth. You'll



and stay on a given ADF bearing with Rose's help—no more mental gymnastics, such as relative bearing plus magnetic heading equals magnetic heading to the station, etc. . . . or how simple it becomes to figure the reciprocal of the published radial when you're inbound to MMM omni on Victor 10.

Try these few easy steps—before going to the next step close your eyes and visualize:

1. Learn the four cardinal directions. (Fig. 1)

North or 360° is generally at the top in your mind's eye.

Reciprocals are: 90°—270°
180°—360°

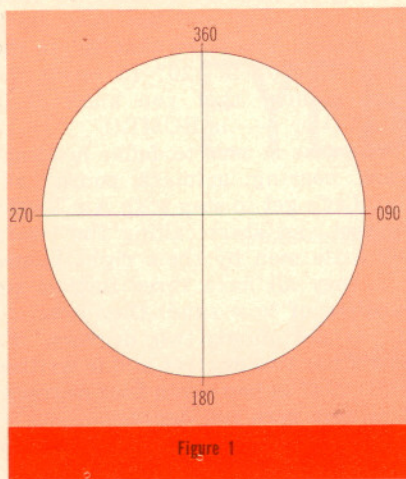


Figure 1

Hint: Always keep the 360 mark at the top . . . never mentally or physically rotate a rose or a chart in order to align your track with your airplane's heading.

2. Next memorize the four bisector directions and their reciprocals. (Fig. 2)

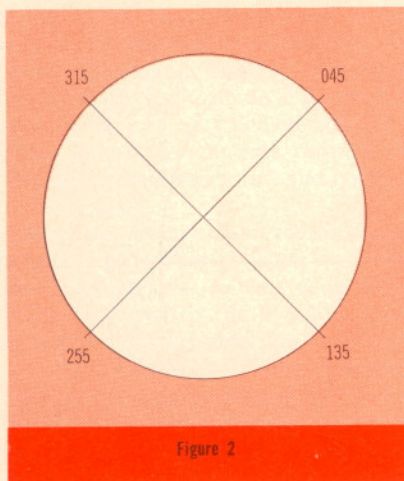


Figure 2

Reciprocals: 045°—225°
135°—315°

3. Learn the eight directions at 30° increments from the cardinal directions. (Fig. 3)

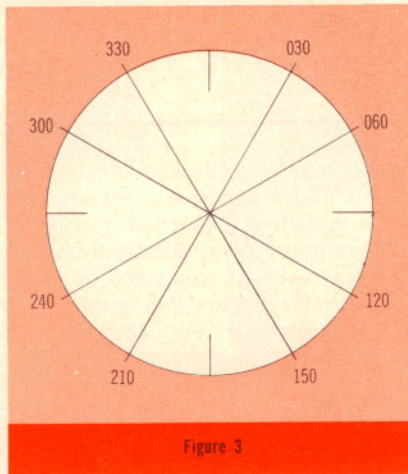


Figure 3

Reciprocals: 090°—270°
060°—240°
120°—300°
150°—330°

There's nothing new about this . . . pilots have been doing these things for years . . . the only fault lies in the fact that few instructors ever sat down and went at it from the start with their students.

4. Learn these rules for changing directions:

When turning to the RIGHT:
Turn: 45° Add 50 subtract 5
90° Add 100 subtract 10
180° Add 200 subtract 20
270° Add 300 subtract 30

When turning to the LEFT:
Turn: 45° Subtract 50 add 5
90° Subtract 100 add 10
180° Subtract 200 add 20
270° Subtract 300 add 30

Try to stay clear of mentally going through 360. To help do this, remember 180° left is the same as 180° right; 90° left equals 270° right; 270° left equals 90° right. If your heading is 040° and you turn 90° left, mentally add 300, subtract 30 and you roll out on 310°. If you start with a heading of, say 220°, and plan a 180 to the right, it's easier to subtract 200 and add 20 to roll out on 040 than it is to get tangled up going through the 360° mark.

5. Now let's review with a warm-up—in the table below, we start with an original heading in the left column. The top of each successive column shows the amount and direction of the turn. We filled the first line in showing each new heading after the turn. Note that the final heading we record in the right hand column is the same as original heading.

You might time yourself in filling in the other spaces—if you can correctly do a line a minute you've learned the compass rose.

ORIGINAL HEADING	AMOUNT OF TURN							
	90 R	180 R	270 R	45 R	90 L	180 L	270 L	45 L
040	130	310	220	265	175	355	085	040
150								
075								
210								
020								
345								
165								
230								
072								
358								
114								
007								

• Here are the answers to the compass rose questions appearing on page 21: 1. 112°; 2. (a) 310°, (b) 220°; 3. first turn, 124°, second, 304°; 4. 244°; 5. 115°.