

NAVIGATION SYSTEMS (chapter 8)

VOR TEST FACILITY (VOT)

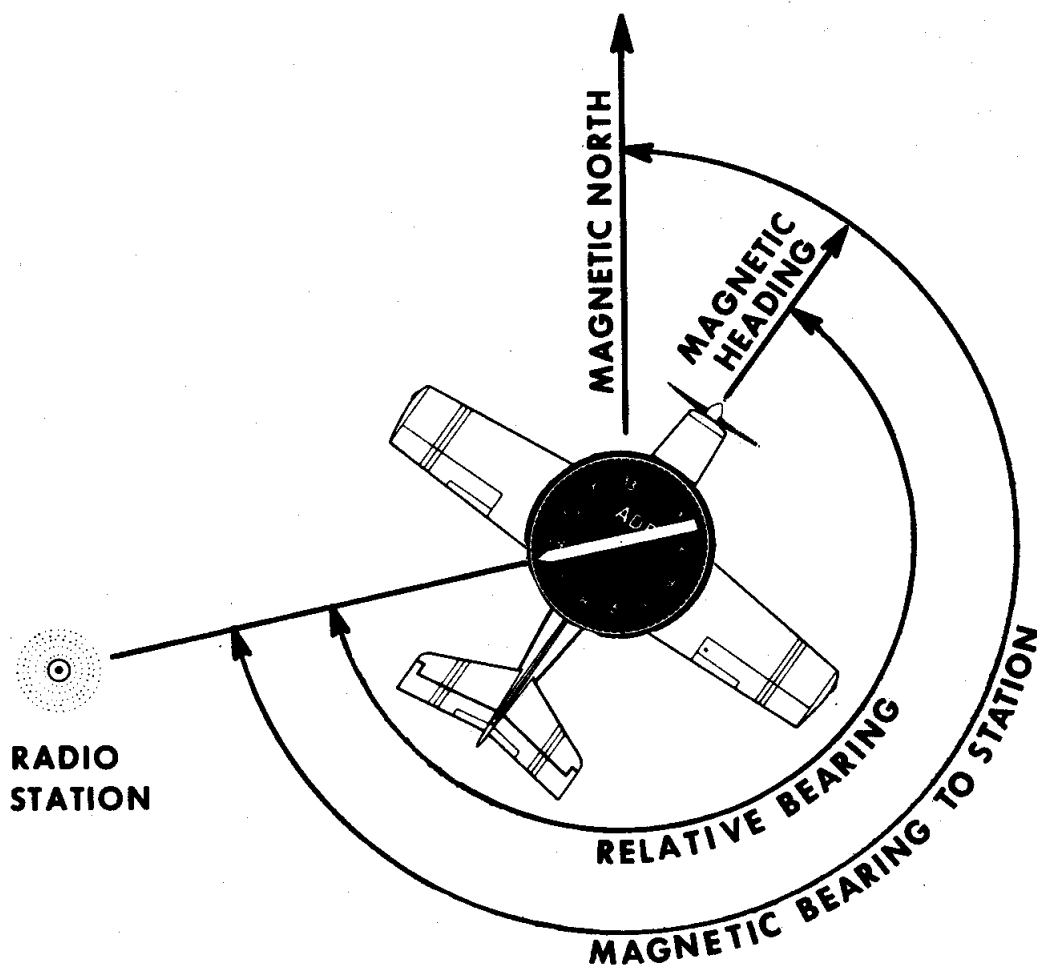
1. VOR Test Facilities (VOTs) are available on a specific frequency at certain airports. The facility permits you to check the accuracy of your VOR receiver while you are on the ground.
2. Tune the navigation radio to the specified VOT frequency, and center the course deviation indicator.
 - a. The OBS should read either 00 or 180°, regardless of your position at the airport.
 - b. If 0°, the TO/FROM indicator should indicate FROM.
 - c. If 180°, the TO/FROM indicator should indicate TO.
 - d. Accuracy of the VOR should be $\pm 14^\circ$.

DETERMINING POSITION

1. Several FM exam questions require you to identify your position based on the intersection of given radials of two VORs.
 - a. To locate a position based on VOR radials, draw the radials on your chart or on the plastic overlay during the FM knowledge test.
 - b. Remember that radials are from the VOR, or leaving the VOR.
 - c. Make sure you have located the correct radial on the compass rose before drawing your line.
 - d. Recheck yourself by counting in 10° or 5° intervals from each of the closest 30° intervals that are numbered and marked with an arrow.
2. Other FM exam questions require you to identify your position based upon the indications of a single VOR.
 - a. You must compare the OBS setting and the TO/FROM indicator with the aircraft heading. To indicate correctly, the OBS (top) setting must correspond roughly with the aircraft heading (e.g., 180° OBS (top) setting, 180° aircraft heading).
 - b. The TO/FROM indicator must correspond to the aircraft's flight path in relation to the VOR. Flying TO a VOR with a FROM indication and flying FROM a VOR with a TO indication will result in reverse sensing.
 - c. When flying directly from a station, the heading and the radial being flown will correspond (i.e., 360° heading FROM will be the 360° radial).
 - d. When flying directly TO a station, the heading flown and the radial being flown will be reciprocals (i.e., 180° heading TO will be on the 360° radial).
 - e. With regard to CDI deflection, you must pretend your airplane has the same heading as the OBS setting. A left deviation means you are right of course, and a right deviation means you are left of course.
 - 1) If your heading and the OBS setting are not roughly the same, the CDI will not indicate correctly.
 - f. If no TO or FROM flag indication appears, the aircraft is in the area of ambiguity, i.e., 190° away from the radial dialed up on the OBS. To know the side of the station on which the aircraft is located, consult the CDI. The needle points toward the station.

AUTOMATIC DIRECTION FINDER (ADF)

1. The ADF indicator always has its needle pointing toward the NDB station (nondirectional beacon, also known as a radio beacon).
 - a. If the NDB is directly in front of the airplane, the needle will point straight up.
 - b. If the NDB is directly off the right wing, i.e., 3 o'clock, the needle will point directly to the right.
 - c. If the NDB is directly behind the aircraft, the needle will point straight down, etc. d. The figure on the opposite page illustrates the terms that are used with the ADF.
2. Relative bearing (RB) to the station is the number of degrees you would have to turn to the right to fly directly to the NDB. On a fixed card ADF, the
 - a. Relative bearing TO the station is shown by the head of the needle.
 - 1) In the figure on the opposite page, the RB to the station is 220° .
 - b. Relative bearing FROM is given by the tail of the needle.
 - 1) In the figure below, the RB from the station is 40° ($220 - 180$).



3. Magnetic bearing (MB) to the station is the actual heading you would have to fly to the station.
 - a. If you turn right from your present heading to fly to the station, you are adding the number of degrees of turn to your heading.
 - b. Thus, magnetic heading + relative bearing = magnetic bearing to the station, or $MH + RB = MB$ (TO).
 - 1) For MB (FROM), subtract or add 180° .
 - 2) EXAMPLE: If the airplane shown above has an MH of 40° and an RB of 220° , the MB (TO) is 260° ($40 + 220$). The MB (FROM) is 80° ($260 - 180$).
4. A fixed card ADF always shows 0° at the top.
 - a. Thus, RB may be read directly from the card and MB must be calculated using the above formula.
 - b. If the MB is given, the MH may be calculated as follows: $MB - AB = MH$.
5. A movable card ADF always shows magnetic heading (MH) at the top.
 - a. Thus, MB (TO) may be read directly from the card under the head of the needle.
 - b. MB (FROM) is indicated by the tail of the needle.
 - c. RB may be calculated as follows: $MB - MH = RB$.
6. When working ADF problems, it is often helpful to draw the information given (as illustrated above) to provide a picture of the airplane's position relative to the NDB station.