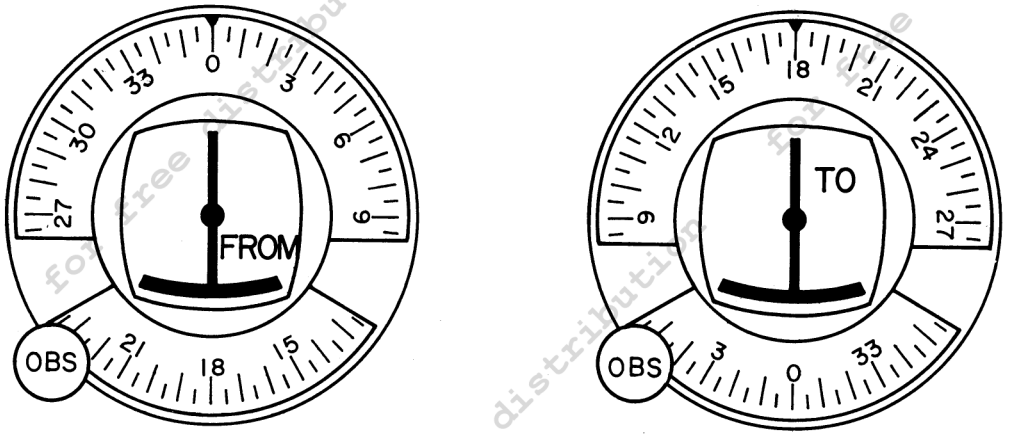
DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration

IFR PILOT EXAM-O-GRAM* NO. 22

VOR RECEIVER ACCURACY CHECK

VOT CHECK ±4° TOLERANCE



0° FROM 180° TO

In actual operations, Air Traffic Control has reported instances where IFR aircraft have been several miles from the center line of the airway. In some of these cases, it is suspected that this course error was due to the inaccuracy of the aircraft's VOR receivers. Results from the Instrument Pilot Written Tests indicate that many pilots need to review the correct procedures for checking their VOR receivers.

FAA regulations state that no person may operate a civil aircraft under IFR using the VOR system of radio navigation unless the VOR equipment in that aircraft--

(1) is maintained, checked, and inspected under an approved procedure; or

(2) has been operationally checked within the preceding 10 hours of flight time and within 10 days before flight, and was found to be within the limits of the permissible indicated bearing error set forth.... (FAR 91.25b and c).

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Assume that your aircraft is not maintained, checked, and inspected under an approved procedure. You last checked your VOR receiver 11 days ago and, during the ensuing period, your aircraft has flown 6 hours. In this case,

(1) can you legally takeoff on an IFR flight before checking your VOR system?

(2) can you takeoff on an IFR flight when the weather is VFR if you check your receiver by a ground point after becoming airborne?

The answer to both of these questions is NO. You must comply with both aspects of the rule. The check must have been made within the preceding 10 hours of flight time, and also the check must have been made within the preceding 10 days.

* Exam-O-Grams are non-directive in nature and are issued solely as an information service to individuals interested in Airman Written Examinations.

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WHAT IS A VOT AND WHAT PROCEDURE SHOULD BE USED TO CHECK YOUR RECEIVER BY USE OF THE VOT OR A RADIATED TEST SIGNAL FROM AN APPROPRIATELY RATED REPAIR STATION?

The VHF Omnitest Equipment (VOT) is a complete facility for transmitting and monitoring a standard test signal used for checking VOR receivers. The VOT can be described as a low powered VOR facility which transmits omnidirectionally a zero (0) degree VOR course. When you tune in the VOT, you should get the same indications as you would for any VOR if you were on the 0 radial: If you set the Omnibearing Selector (OBS) to 0, then your receiver should indicate "From" on the "To-From" indicator, and the Course Deviation Indicator (CDI) should be centered. If you set the OBS to 180, then the "To-From" indicator should indicate "To" and the CDI should be centered.

The recommended procedure for using the VOT to check a VOR receiver is to tune the VOR receiver to the published frequency of the test facility, found in the Airport/Facility Directory of AIM. Next, turn the OBS until the CDI is centered. If the "To-From" indicator is "From," the OBS must be within $\pm 4°$ of 0; if the "To-From" indicator is "To," the OBS must be within $\pm 4°$ of 180. If the receiver does not check within these limits, it may not be used for an IFR flight.

CAN THE VOR RECEIVER BE CHECKED BY USE OF THE VOT WHEN AIRBORNE?

VOT frequencies are not protected; therefore, when airborne you might have interference from another transmitter. For this reason, you should make your VOT check on the ground.

WHAT OTHER METHODS CAN BE USED TO CHECK YOUR VOR RECEIVER WHEN ON THE GROUND?

(1) There are approximately 275 airports that have one or more points marked on the airport where a VOR receiver check can be made. A list of these airports, giving the certified radial and the point on the airport for checking VOR receivers is found in Part 4 of the Airman's Information Manual. If you are at one of these airports, you can check your receiver by taxiing to the designated point on the airport, tuning the VOR receiver to the VOR facility to be used, and then setting the OBS to the certified radial. The receiver should then read "From" on the "To-From" indicator and the CDI should be centered. If the OBS has to be turned more than 4°, right or left, to center the CDI, an IFR flight shall not be attempted without first correcting the source of the error in the VOR system.

(2) If you have dual system VOR (units independent of each other except for the antenna) and are able to obtain an adequate signal from a VOR facility, then you may check one receiver against the other. The maximum permissible variation between the two indicated bearings is 4°.

VOR RECEIVER CHECK POINTS

The list of VOR airborne check points and ground check points are included in this section. Use of these Check Points is explained in Part 1.

ARKANSAS

Airborne—

Blytheville (Muni Arpt) : 094° ; 5.8 mi. over hangar adj to Admin Bldg ; 1300′.
Fayetteville (Drake Fld) : 182° ; 14.3 mi, white circle on arpt ; 2500′.
Flippin: 051° ; 5.0 mi, dual water twr at Mountain Home ; 1900′.
Fort Smith (Muni Arpt) : 233° ; 5.2 NM, water tank at N edge of arpt ; 1500′.
Monticello: 305° ; 5.7 mi over white water twr ; 1500′.
Texarkana (Muni/Webb Fld) : 122° ; 5.1 mi, over int rnwys 13-31 and 4-22 ; 1400′.

Ground—

El Dorado (Goodwin Fld) : 228° ; 3.8 NM, parking ramp at center twy.
Harrison (Boone Co. Arpt) : 131° ; 4.3 NM at int of N/S and E/W twys in front of trml bldg.
Little Rock (Adams Fld) : 315° ; 4.5 mi, on taxi strip adj to junction rnwy 14.
Jonesboro (Muni Arpt) : 226° ; 3.9 NM NE corner of terminal ramp.
Pine Bluff (Grider Fld) : 180° ; 4 mi int of ctr twy and N/S rnwy.
Walnut Ridge (Muni Arpt) : 051° ; 1.7 mi, taxi strip at parking ramp adj to tetrahedron.

WHAT PROCEDURE SHOULD BE USED TO CHECK YOUR VOR RECEIVER WHILE AIRBORNE?

NOTE: This check should be made on a VFR flight.

Suggested steps:

1. Check AIM (Part 4) for a checkpoint on the ground, the certified radial to use, and the minimum altitude to fly (if given).
2. Tune the VOR receiver to the proper facility.
3. Set the OBS to the certified radial.
4. Fly directly over the ground checkpoint.

When directly over the ground checkpoint, the CDI should be centered; if not, turn the OBS until the CDI is centered. If the indicated course with the CDI centered is more than ±6° from the certified radial, then the receiver is not performing satisfactorily and must be corrected before an IFR flight. Notice that a ±6° error is allowed for this airborne check while an error of only ±4° is allowed for the ground check. This additional error is allowed due to the difficulty of positioning your aircraft directly over the ground point.

NOTE: If no check signal or point is available while in flight--

1. Select a VOR radial that lies along the centerline of an established VOR airway;
2. Select a prominent ground point along the selected radial preferably more than 20 miles from the VOR ground facility and maneuver the aircraft directly over the point at a reasonably low altitude; and
3. Note the VOR bearing indicated by the receiver when over the ground point (the maximum permissible variation between the published radial and the indicated bearing is 6°).

WHAT PROCEDURE SHOULD BE FOLLOWED BY THE PILOT AFTER MAKING A VOR EQUIPMENT CHECK?

FAR 91.25d states: "Each person making the VOR operational check as specified...shall enter the date, place, bearing error, and his signature in the aircraft log or other permanent record."

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