

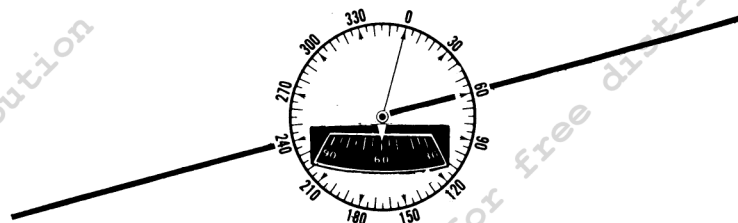
Department of Transportation
FEDERAL AVIATION ADMINISTRATION
VFR PILOT EXAM-O-GRAM* NO. 15

HOW TO USE VOR
(Series 1)

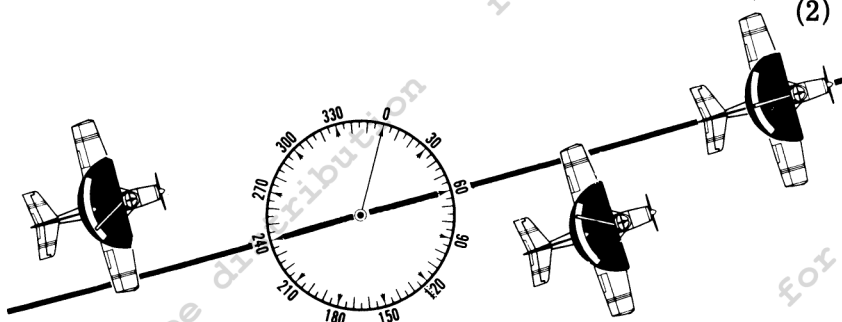
The VHF omnirange, commonly referred to as VOR, has largely replaced the low frequency, four-course radio range as an aid to navigation. VOR offers many advantages over the low frequency range -- (1) it is less susceptible to static; (2) an unlimited number of courses are available; and (3) navigational information is visual rather than aural. Since most modern aircraft are equipped with VOR receiving equipment, it behooves each pilot to know and understand how to use this equipment properly. The VFR pilot should use radio navigation along with other methods of navigation to maintain his desired course. Always double-check your position by aeronautical chart.

WHAT ARE THE VOR RECEIVER COMPONENTS USED BY THE PILOT? (1) COURSE (or omnibearing) SELECTOR; (2) LEFT-RIGHT (or vertical) needle; and (3) TO-FROM indicator.

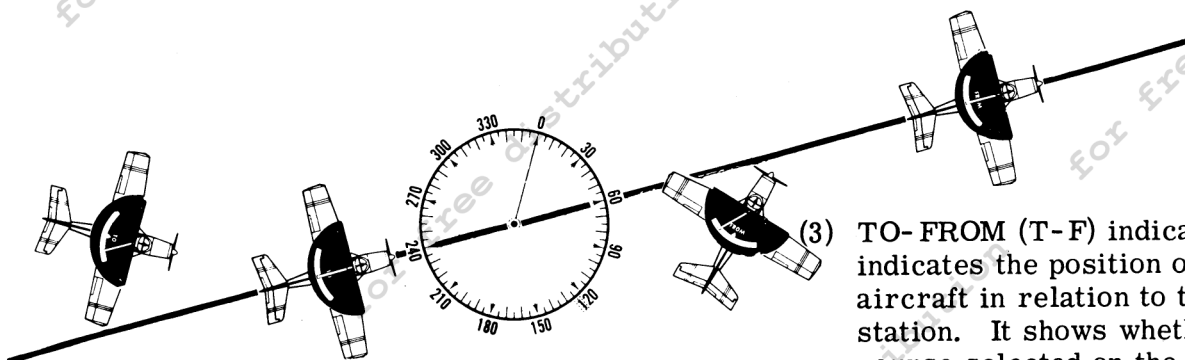
WHAT IS THE FUNCTION OF EACH OF THESE COMPONENTS?



(1) COURSE SELECTOR (CS) -- permits the selection of any course.



(2) LEFT-RIGHT (L-R) needle -- shows the position of the aircraft in relation to the course selected. If the course line is drawn on the chart, passing through the VOR station to which tuned, the L-R needle indicates on which side of the aircraft the desired course lies.

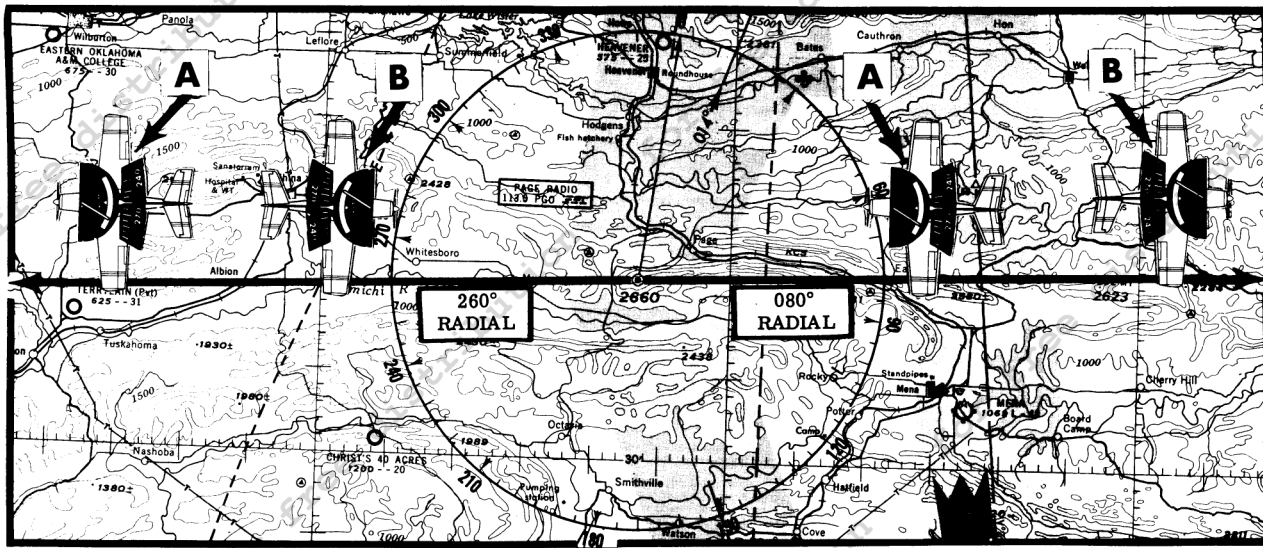


(3) TO-FROM (T-F) indicator -- indicates the position of the aircraft in relation to the VOR station. It shows whether the course selected on the CS, if intercepted and flown, will take you to or from the station.

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WHAT IS A RADIAL? It is a line of magnetic bearing extending from the station. Note the easterly-westerly line in the illustration. East of the VOR station, this line is the 080° radial; west of the station, this line is the 260° radial.

WHAT IS PROPER SENSING? Simply this -- if the L-R needle is to the right, the desired course is to your right; if the L-R needle is to the left, the desired course is to your left. In other words, the desired course is on the same side as the L-R needle. (NOTE: With reverse or opposite sensing, the course is on the opposite side from the L-R needle.)

HOW CAN YOU BE SURE THAT THE LEFT-RIGHT NEEDLE IS GIVING PROPER SENSING? By ensuring that the heading of the aircraft is approximately the same as the course selected on the CS. Assume you wish to maintain a course of 260° which passes over PAGE VOR station. Your heading naturally will be approximately 260° depending on wind direction and speed. In this case your CS should be adjusted to 260° regardless of whether you are east or west of the VOR station. In other words, always set the CS on the course you are flying -- not the reciprocal of your course. Note the L-R needle in both airplanes above labeled A. They give proper sensing.

WHEN DOES THE LEFT-RIGHT NEEDLE GIVE REVERSE SENSING? When the aircraft heading and course selected on the CS are approximately reciprocals (actually, anytime the angle between heading and radial selected is greater than 90°). For example, both airplanes labeled B above are trying to maintain an easterly course of 080°; however, the CS is set on 260° (the reciprocal of 080°). Note that the L-R needle gives reverse sensing in both airplanes labeled B. In this case, the CS should have been set on 080° to get proper sensing.

IS THE INDICATION ON THE TO-FROM INDICATOR DEPENDENT ON THE HEADING OF THE AIRCRAFT? NO! It is dependent only on the setting of the CS and the direction of the aircraft from the station. Note that in the 2 airplanes east of the VOR station the TO-FROM indicates TO; west of the station, the TO-FROM indicates FROM. You could pivot any of the 4 aircraft in the illustration through 360° and there would be no change in the indication on the T-F indicator.

WHEN DOES THE TO-FROM INDICATOR GIVE A NEUTRAL INDICATION? (1) When an unreliable signal is being received (you are either too far from the station or at too low an altitude, or the station is not properly tuned in); or (2) when you pass directly over the station; or (3) when you cross the radials perpendicular to the course selected on the CS. For example, as the airplanes above cross the 350° or 170° radials (and a short distance on either side), the TO-FROM would have a neutral indication.