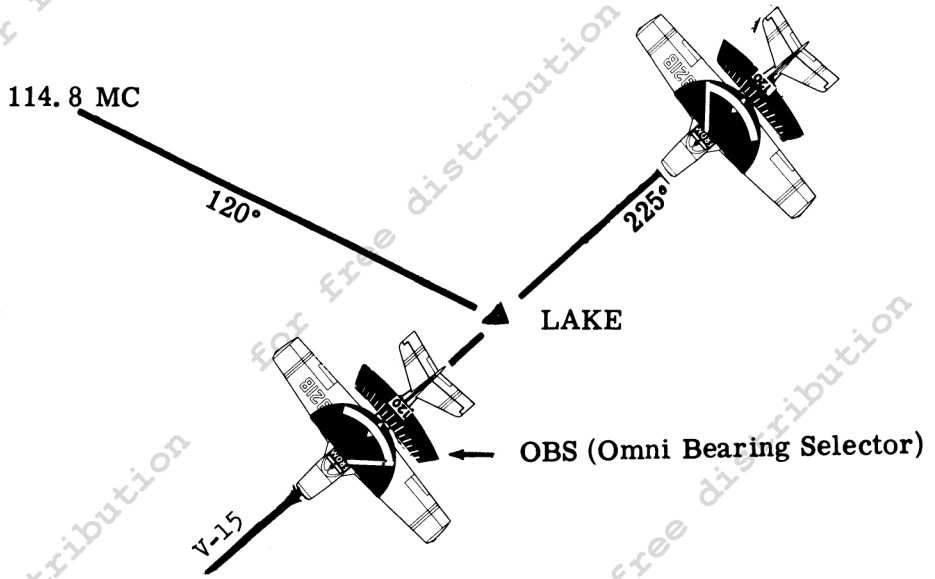
Department of Transportation
FEDERAL AVIATION ADMINISTRATION

IFR PILOT EXAM-O-GRAM* NO. 7

CDI Interpretation

Recurring errors in Instrument Pilot Written Examination test items requiring interpretation of the CDI (course deviation indicator) of the VOR receiver indicate that many applicants do not thoroughly understand this portion of the instrument display. Errors are particularly prevalent in situations where it is necessary to relate aircraft position to an intersection, or to an ILS localizer course. The illustrations that follow will be helpful in preparing for test items in this area, and will be useful for practical application in flight.

ESTABLISHING POSITION AT INTERSECTIONS



In the above illustration, the aircraft is established on V-15 and the pilot wishes to determine position over Lake Intersection. A good procedure is to:

1. Set the frequency selector to the frequency of the VOR/VORTAC used to designate the intersection. Then identify the station.
2. Set the OBS to the published radial FROM the station.

With the receiver set up in this manner, the following statements will always be true:

1. The TO-FROM display will indicate "FROM."
2. Before passing the intersection, the CDI needle will be deflected in the direction of the station used for the intersection.
3. The CDI needle will begin movement toward the center when the aircraft is approximately 10° from the desired radial.
4. The CDI needle will center when the radial is crossed.
5. After passing the intersection, the CDI needle will move from the center to the side away from the station used for the intersection.

This method is used by many experienced pilots because it is simple and provides a good "picture." Equally successful, however, is the method of setting the OBS to the reciprocal of the published radial, in which case the CDI indications are reversed.

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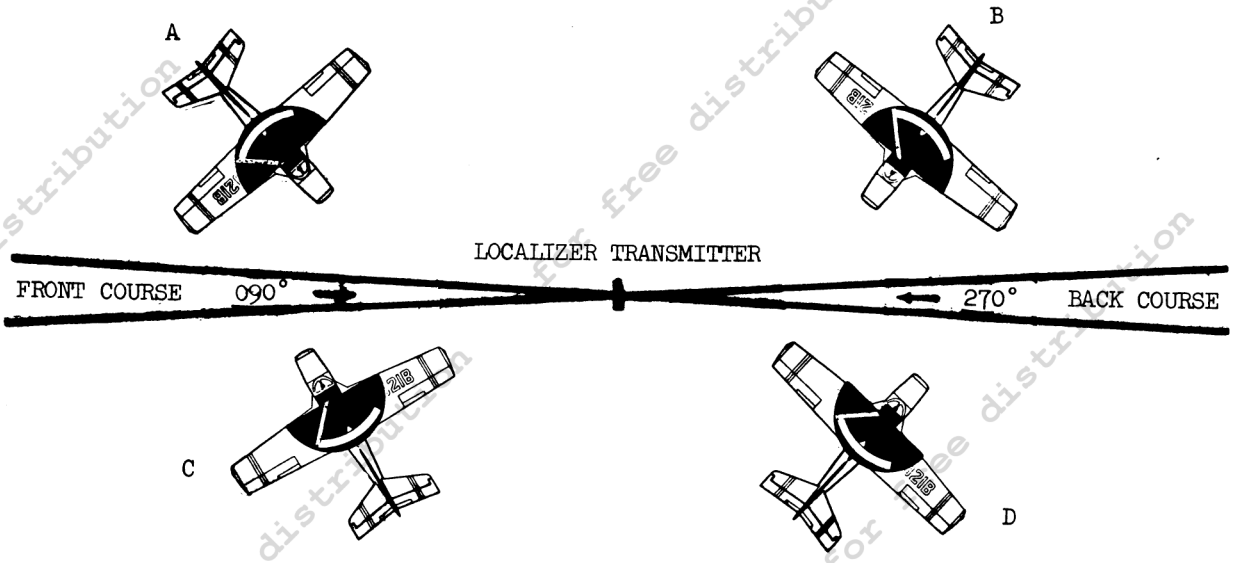
*Exam-O-Grams are non-directive in nature and are issued solely as an information service to individuals interested in Airman Written Examinations.

FLYING THE ILS

In most systems (except integrated flight systems) when the VOR/ILS receiver is tuned to an ILS frequency, the OBS and TO-FROM do not operate in the same manner as when tuned to a VOR. On some receivers the TO-FROM will indicate "TO," and on other receivers it will be blank. With the exception of the pictorial type instruments, such as King KPI 550 and Collins PN01, the CDI senses in relation to the inbound front course of the localizer, regardless of the OBS selection. This is true whether the aircraft is flying on the front course or the back course.

When the aircraft is headed within 90° of the published bearing of the inbound front course (see aircraft A and D), the CDI needle will be deflected in the direction of the localizer course. When the aircraft heading is within 90° of the reciprocal of the front course inbound bearing (see aircraft B and C), the CDI needle will be deflected away from the localizer course.



Look at it another way. If the aircraft is on the side to the right of the inbound front course localizer bearing (see aircraft C and D), the CDI needle will be deflected to the left, regardless of aircraft heading. If the aircraft is on the side to the left of the inbound front course localizer bearing (see aircraft A and B), the CDI needle will be deflected to the right, regardless of aircraft heading.

Remember that full left or full right deflection of the CDI needle occurs at approximately 2 1/2° (or more) from the centerline of the localizer course. This CDI sensitivity is four times greater than when flying VOR, where full left or full right deflection represents approximately 10° from the course centerline.

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