Department of Transportation

FEDERAL AVIATION ADMINISTRATION

VFR PILOT EXAM-O-GRAM* NO. 16

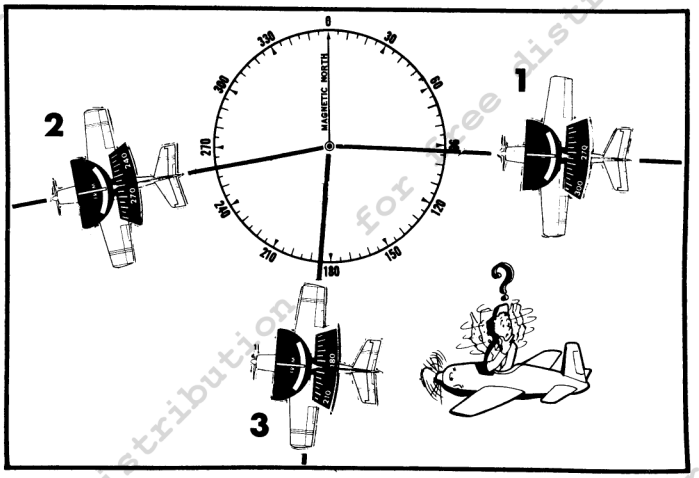
HOW TO USE VOR
(Series 2)

IN WHAT THREE GENERAL WAYS MAY A VOR STATION BE USED AS A NAVIGATIONAL AID?

1- To fly a course directly to a station (Airplane 1).

2- To fly a course directly away from a station (Airplane 2).

3- To determine the direction or bearing of your aircraft from a particular station or stations (Airplane 3).

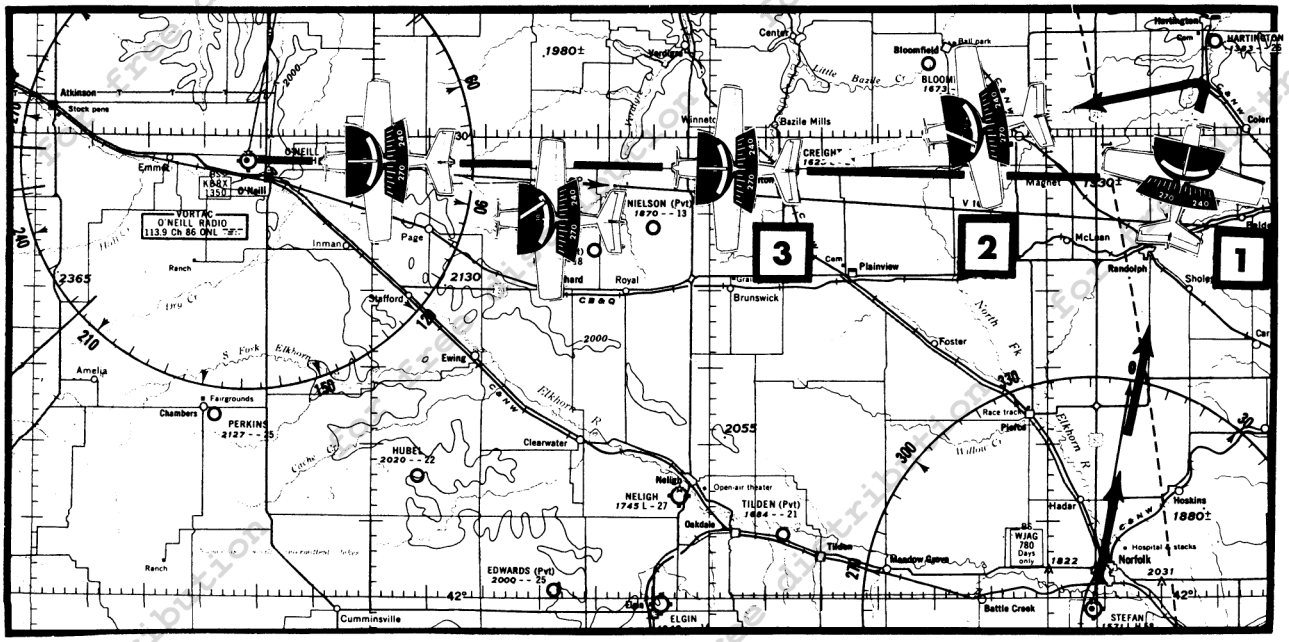


WHAT PROCEDURE SHOULD YOU FOLLOW TO FLY DIRECTLY TO A STATION WHEN YOU ALREADY KNOW YOUR APPROXIMATE DIRECTION FROM THE STATION?

(Assume you are flying from Stephan Airport to Hartington Airport; en route you decide to fly to O'Neill Airport. Visualizing your position, you know you are east of the O'Neill VORTAC.)

1- Tune in and aurally identify the station (O'Neill VORTAC).
2- Turn CS (Course Selector) until the L-R (Left-Right) Needle is centered and TO-FROM indicates TO (Airplane 1).
3- Turn to a heading approximately the same as the setting on the CS (Airplane 2).
4- The L-R Needle now has "proper sensing" (i. e. it is displaced in the direction of the desired course). Keep it centered by making turn corrections toward the needle.

(NOTE: After completing Step 3, you could re-center the L-R needle by readjusting the CS, then follow this new course inbound.)



*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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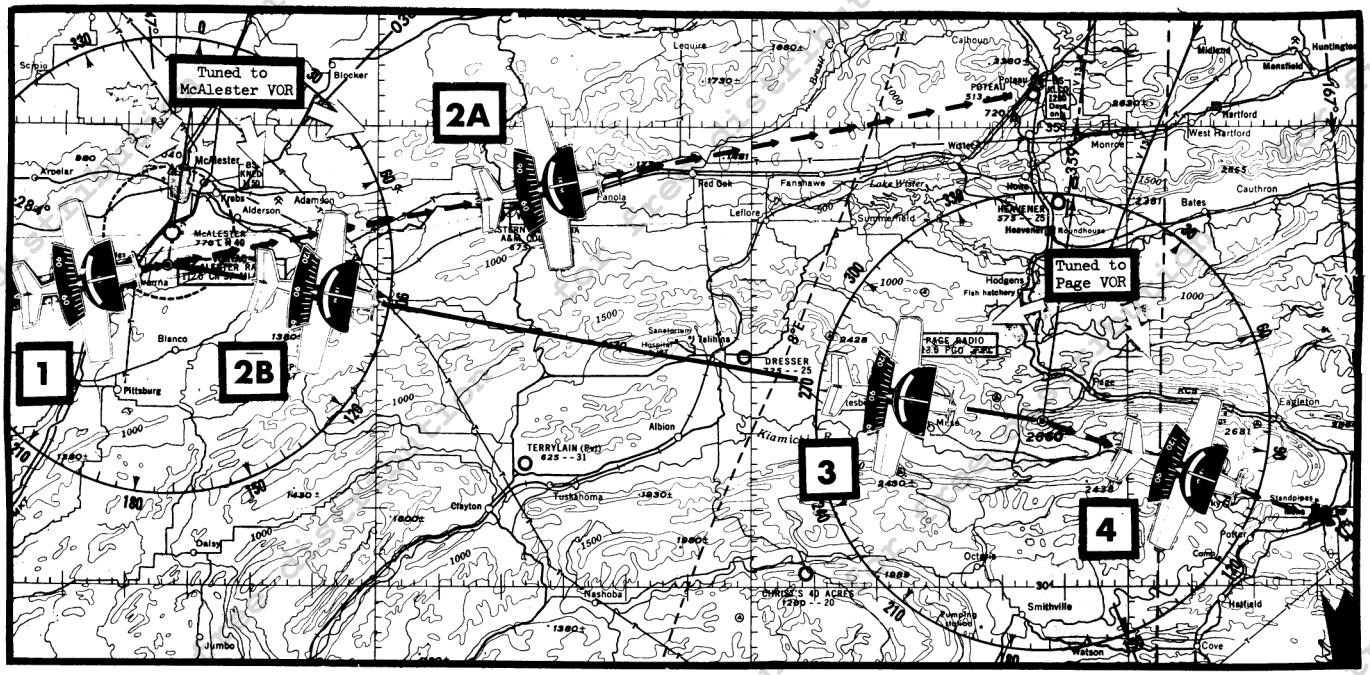
AFTER ARRIVING OVER A STATION, WHAT PROCEDURE SHOULD YOU FOLLOW TO FLY DIRECTLY FROM THE STATION? (Illustration below).

1- As you pass over the station TO will change to FROM. (Airplanes 1, 2A and 2B).
2- At this time turn the CS to the radial which you wish to follow outbound (Airplane 2B).
3- Turn the aircraft to a heading which approximates the new setting of the CS.
4- The L-R Needle now has "proper sensing". Keep it centered by making correcting turns toward the needle. If the needle is displaced to the left, the desired course is to the left and a correcting turn should be made to the left; if the needle is displaced right, the desired course is right and a turn correction should be made to the right.

(NOTE: If your outbound course from the station is the same as the inbound course, then make no change in the CS in Step 2 and continue on your same general heading -- Airplanes 1 and 2A.)

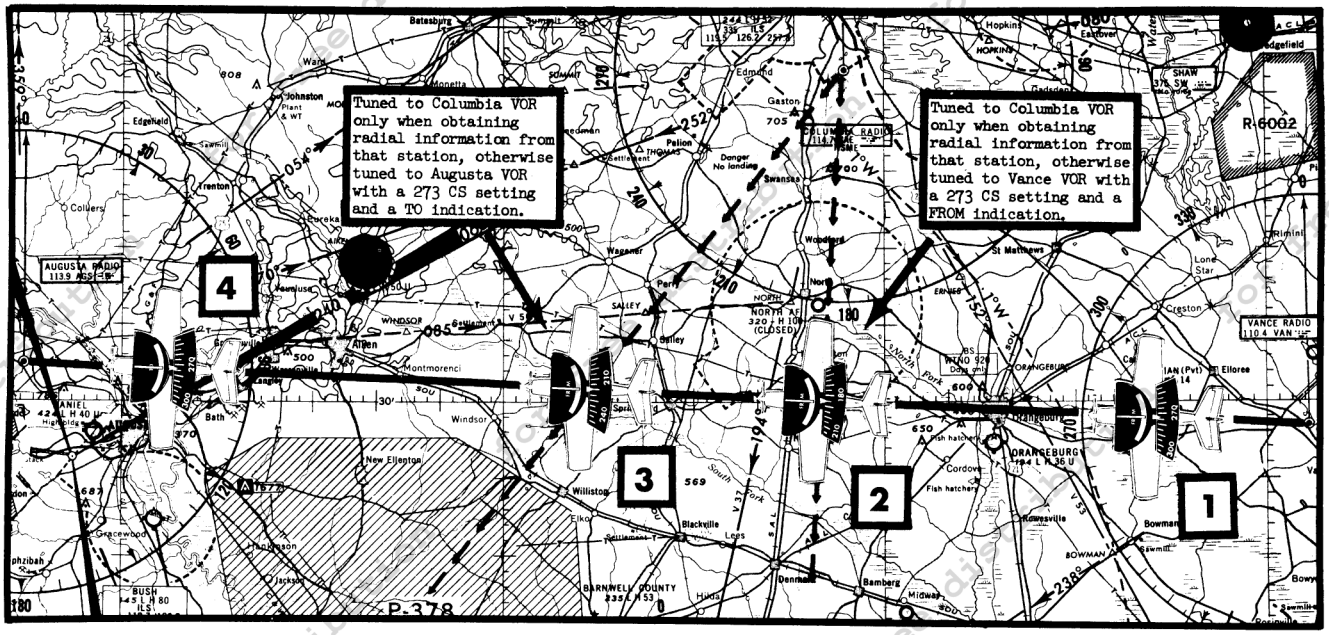


UNDER WHAT SITUATIONS WOULD YOU BE FLYING DIRECTLY FROM A VOR STATION? (Illustration above).

1- The first half of a flight between VOR stations (Airplane 2B).
2- To help you find an airport located in the vicinity of a VOR station by flying outbound from the station along the radial on which the airport is located (Airplane 2A or 4).

WHAT PROCEDURE SHOULD YOU FOLLOW TO DETERMINE YOUR DIRECTION OR BEARING FROM A STATION? (Illustration below).

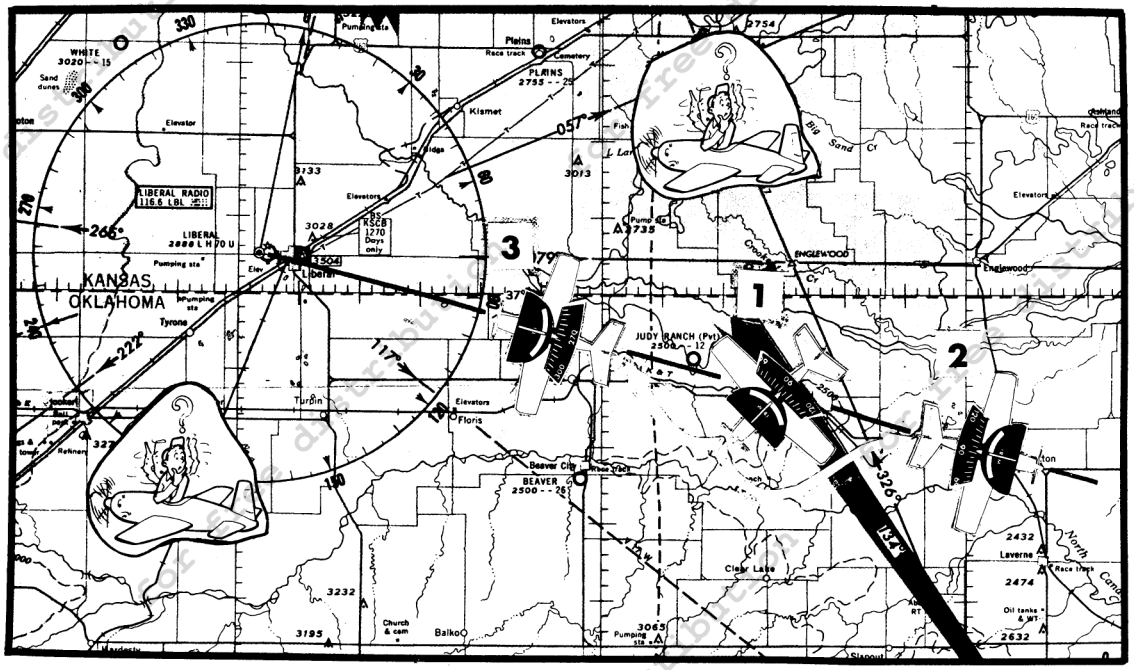
1- Tune in and aurally identify the station (Columbia VOR).
2- Rotate the CS until the L-R Needle is centered and the TO-FROM indicator indicates FROM (Airplanes 2 and 3).
3- The setting of the CS represents the radial on which you are located (185° for #2 and 220° for #3). Draw the radial on the chart and you will have your line of position.
4- Visualize your position -- you are south and southwest respectively from the station. You do not know how far south or southwest of the station without additional information.



IN WHAT WAY WILL IT BE HELPFUL TO YOU TO KNOW YOUR BEARING FROM A VOR STATION? (Illustration above).

1- If you are flying a course from Vance VOR to the Augusta VOR station (Airplanes 1, 2, 3, 4), you can determine your position along this route by finding your bearing from a VOR station on either side of your route (Airplanes 2 and 3).
2- If you are uncertain of your position, you may determine your bearing from two or more VOR stations. Draw these radials on the chart and your position will be where they intersect. Actually, you are doing this in the illustration above -- you are maintaining a specific radial FROM Vance VOR and TO Augusta VOR. You determine your radial from the Columbia VOR. The intersection of the two radials is your position. You would keep your radio tuned to Vance during the first half of the flight and to Augusta during the second half except when determining your radial from the Columbia VOR.

(NOTE: Knowledge of your exact position during the second half of this flight becomes very important so that you may be sure of avoiding the Prohibited Area, P-378, southwest of Airplane 3).



WHAT ARE THE SUGGESTED STEPS TO FOLLOW WHEN YOUR POSITION RELATIVE TO A VOR STATION IS UNKNOWN?

1- Tune in and aurally identify the station (Liberal VOR in the illustration above).

2- Turn the CS until the L-R Needle is centered and FROM appears on the TO-FROM Indicator (Airplane 1). (Remember, the heading of your aircraft will not affect the reading of the TO-FROM Indicator). The resulting setting of the CS tells you the radial on which the aircraft is located or, in other words, your bearing or direction from the station. For example: If the CS reads 225°, you are southwest of the station; 090°, you are east, etc. In the illustration, you are on the 093° radial; however, you do not know how far east of the station you are.

3- Visualize your position relative to the station -- always do this! After determining your bearing and visualizing your position, if you wish to fly directly away from the station along the radial on which you are located, you merely turn to a heading approximately the same as the setting on the CS (Airplane 2). The L-R Needle will have "proper sensing" and you should make corrections (toward the needle) to keep the L-R Needle centered.

4- After determining your bearing and visualizing your position, if you wish to fly directly to the station from your present position, you rotate the CS (approximately 180°) until the L-R Needle is centered and the TO-FROM indicates TO. Turn the aircraft to a heading approximately the same as the setting on the CS and make corrections (toward the needle) to keep the L-R Needle centered (Airplane 3). Since the heading of the aircraft and the setting on the CS are approximately the same, the L-R Needle will have "proper sensing".

IT MAKES GOOD SENSE TO HAVE PROPER SENSING
GET SHARP ON VOR - IT CAN TAKE THE HEADACHE OUT OF NAVIGATION

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