Answers: 1. C

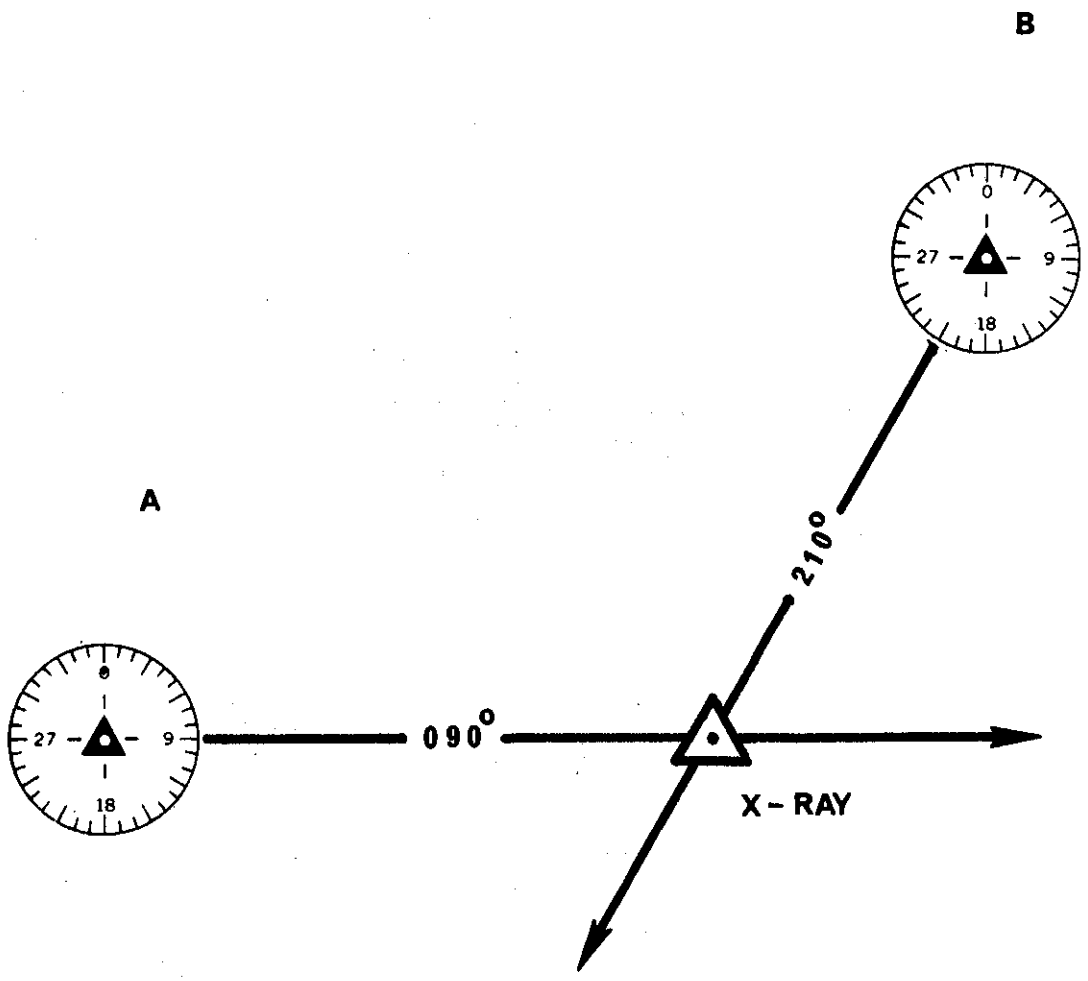
2. B

POSITION FIXING - INTERSECTIONS

FRAME 45

Navigation charts show points at which two or more radials intersect. These intersections are used as check points for navigation and as reporting points.

X-RAY intersection is made up of the _____° radial from station A and the _____° radial from station B

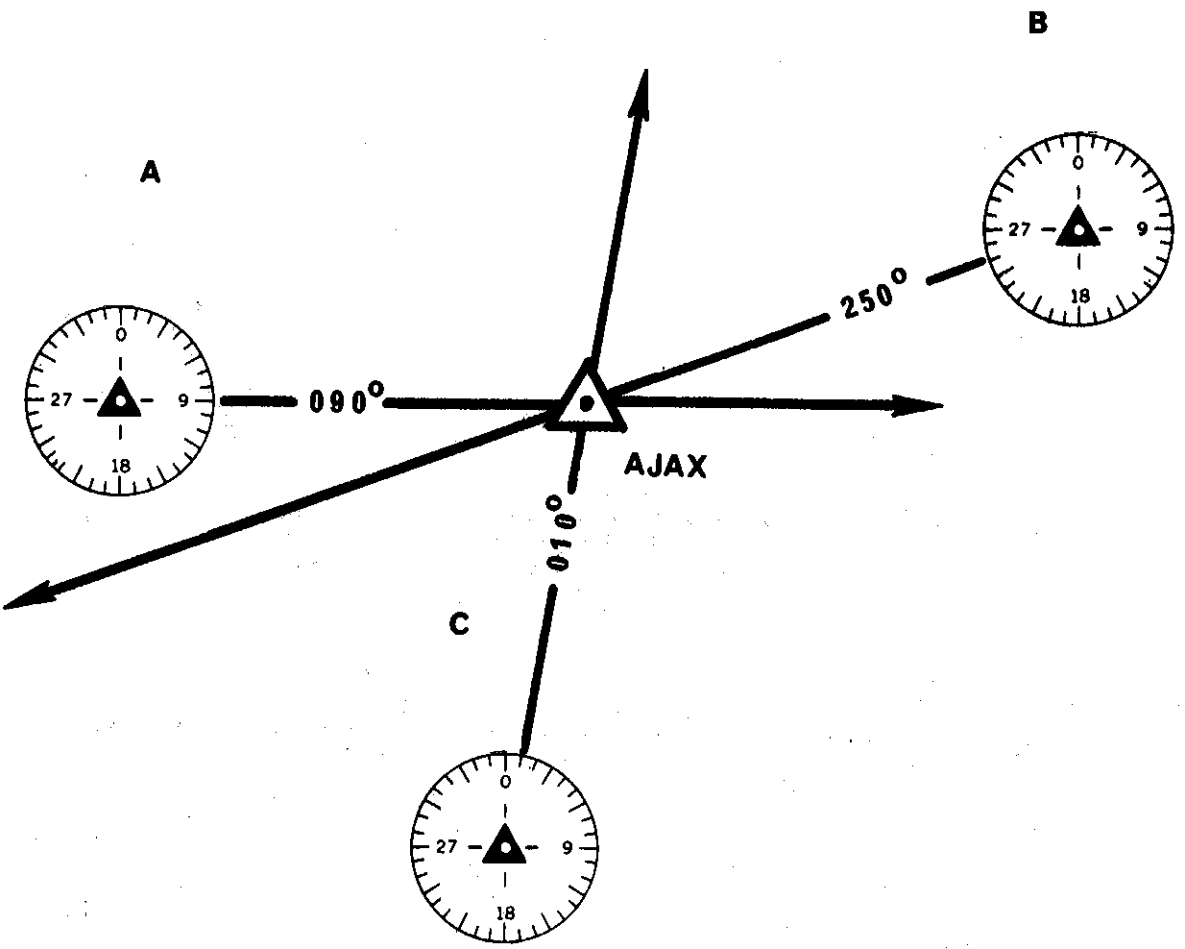


Answers: 090°, 210°

FRAME 46

An accurate intersection is made up of radials which intersect at an angle of at least 30°. Radials intersecting at 90° would form the most accurate intersection (fix).

An accurate fix of the AJAX intersection would be made up of the 090° radial from station A and the _____° radial from station _____.

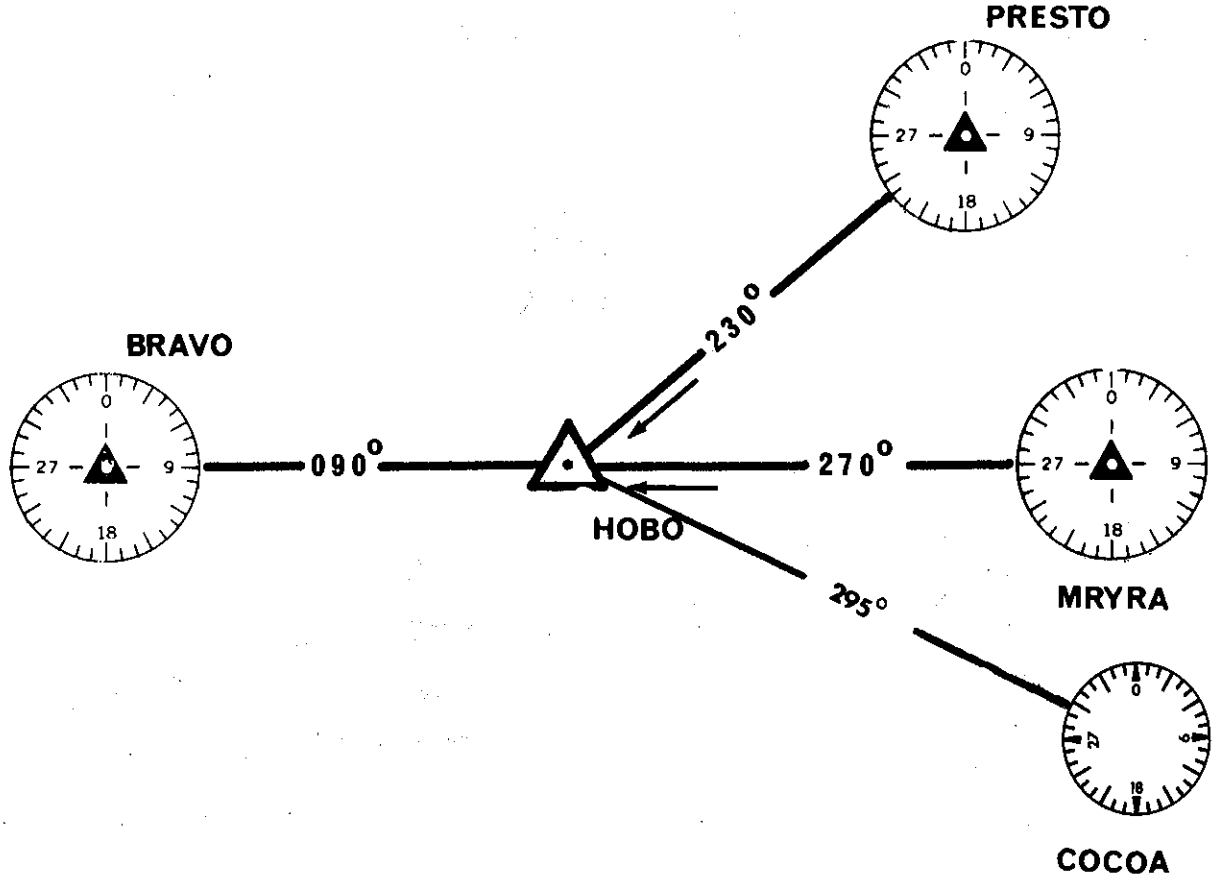


Answers: 010°, C

FRAME 47

Where several radials come together at the same intersection, small arrows printed on the chart show which radials should be used to fix the intersection. The intersection is flight checked by the FAA using these radials.

HOBO intersection is formed by the _____° radial from _____, and the _____° radial from _____.

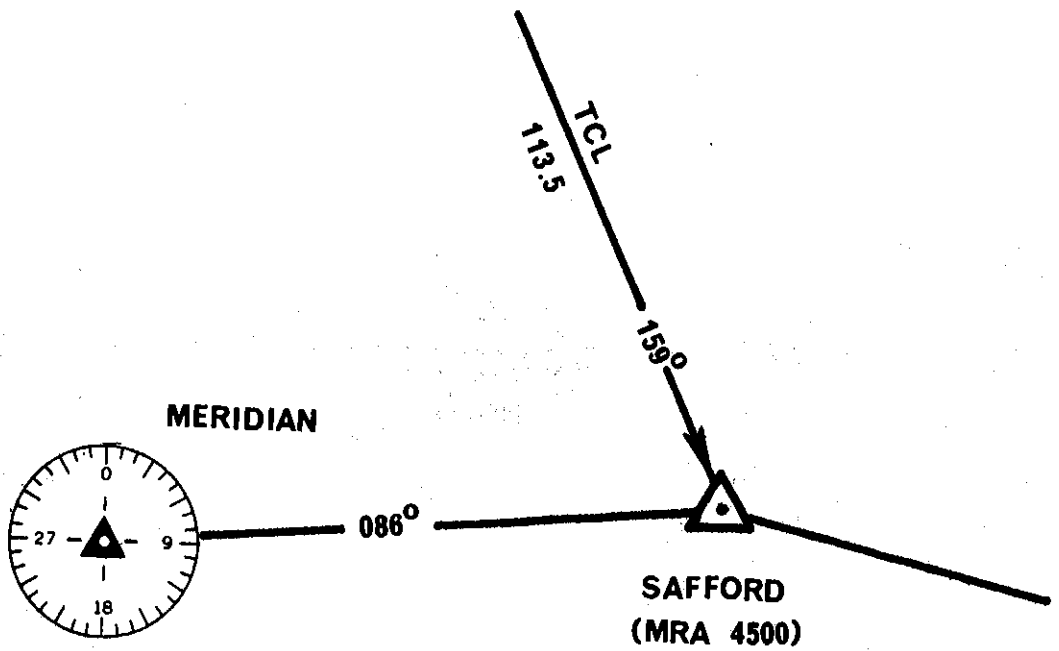


Answers: 270°, MRYRA
230°, PRESTO (either order)

FRAME 48

You learned earlier that omni stations are restricted by "line of sight" transmission and the signal can not be received at low altitudes very far away from the station.

You are flying eastbound from Meridian and need to fix the SAFFORD intersection. You must tune in _____(ident.) on a frequency of _____, and set up _____° with the course selector. The minimum altitude at which you can reliably fix the SAFFORD intersection is _____feet.

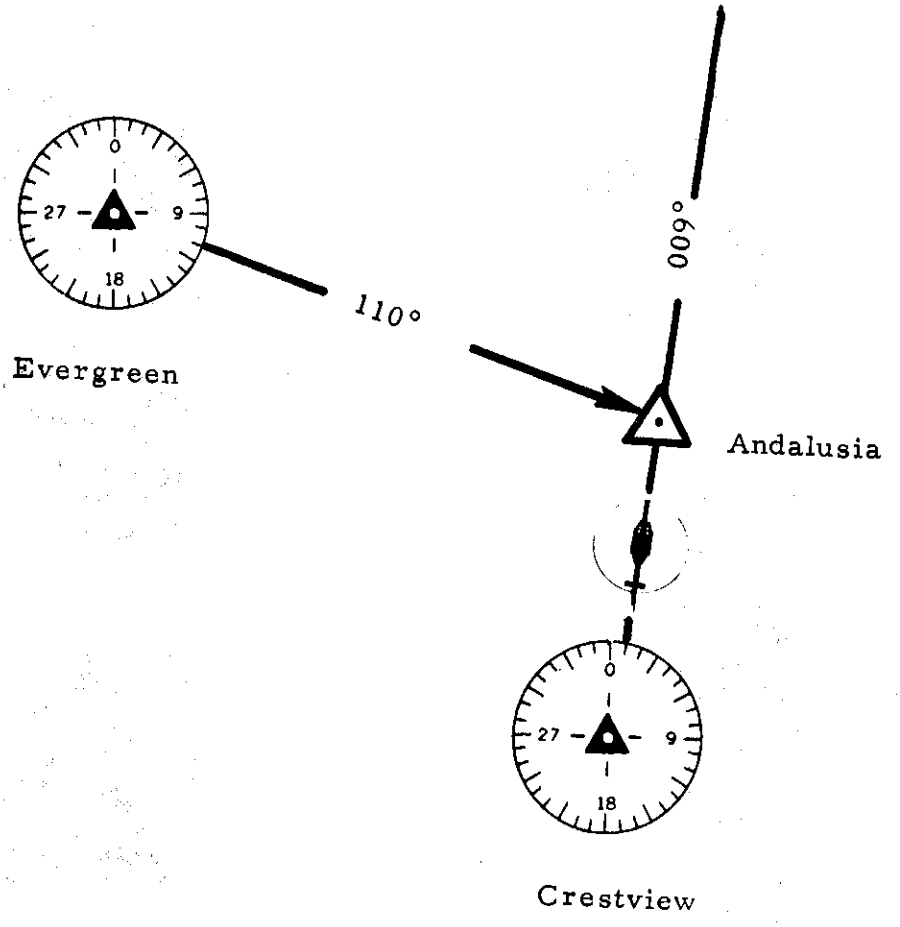


Answers: TCL, 113.5, 159°, 4500

FRAME 49

An aviator is flying northbound from Crestview and has established the heading necessary to stay on track.

To fix position over the Andalusia intersection, the aviator tunes and identifies Evergreen. He will be over Andalusia at the time the aircraft crosses the _____° radial from Evergreen.



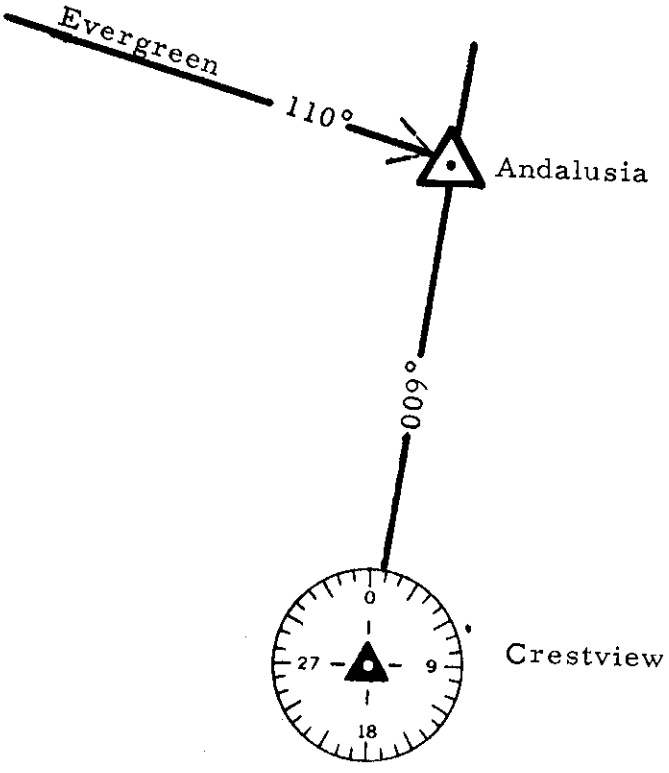
Answer: 110°

FRAME 50

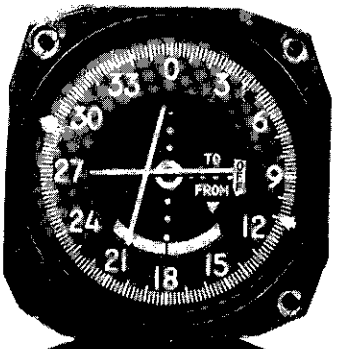
The pilot sets up 110° on the course selector with Evergreen tuned in. Why does the TO-FROM indicator show FROM? _____

_____.

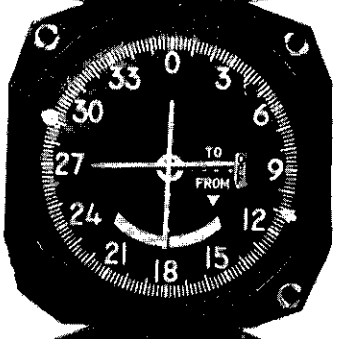
Which of the course indicators shows that the aircraft is over Andalusia? _____



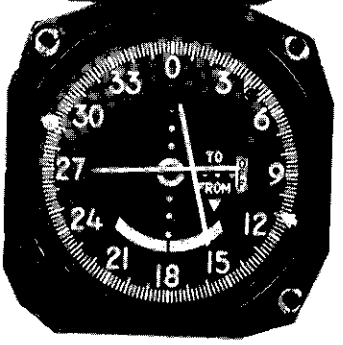
A.



B.



C.



Answers: because the 110° radial goes <u>from</u> Evergreen
B. (centered needle)

FRAME 51

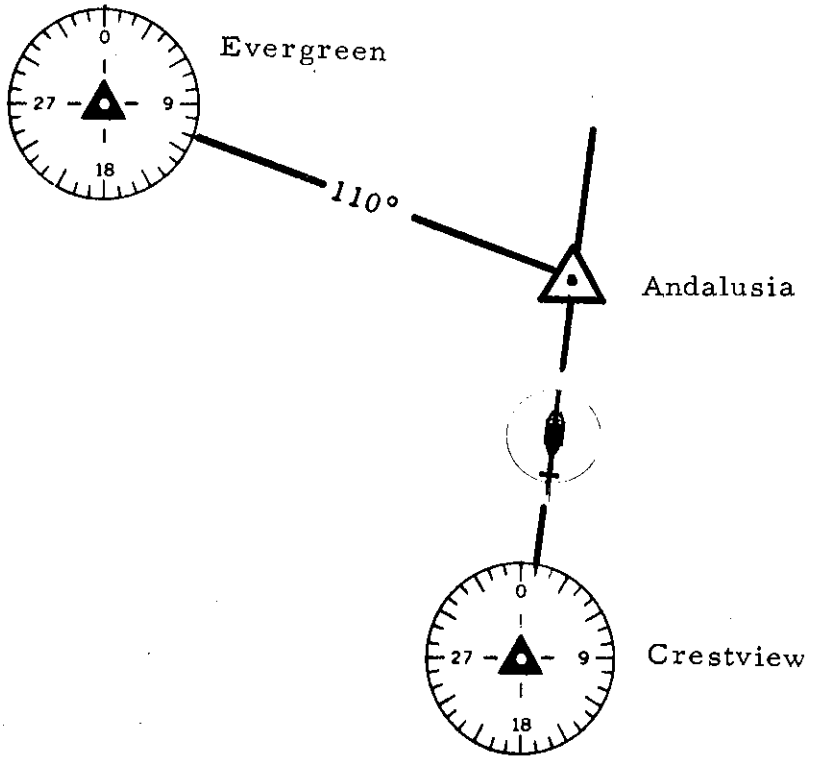
The case below is typical of fixing an intersection - notice these things:

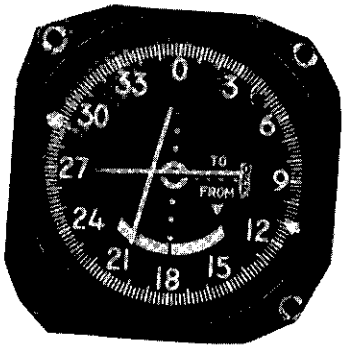
1. The aircraft has not yet reached the intersection.

2. The pilot has set up the radial with the course selector thereby causing the sense indicator to show _____.

3. The station tuned to fix the intersection (Evergreen) is to the pilot's _____(left/right).

4. And also, the needle is deflected to the _____(left/right).





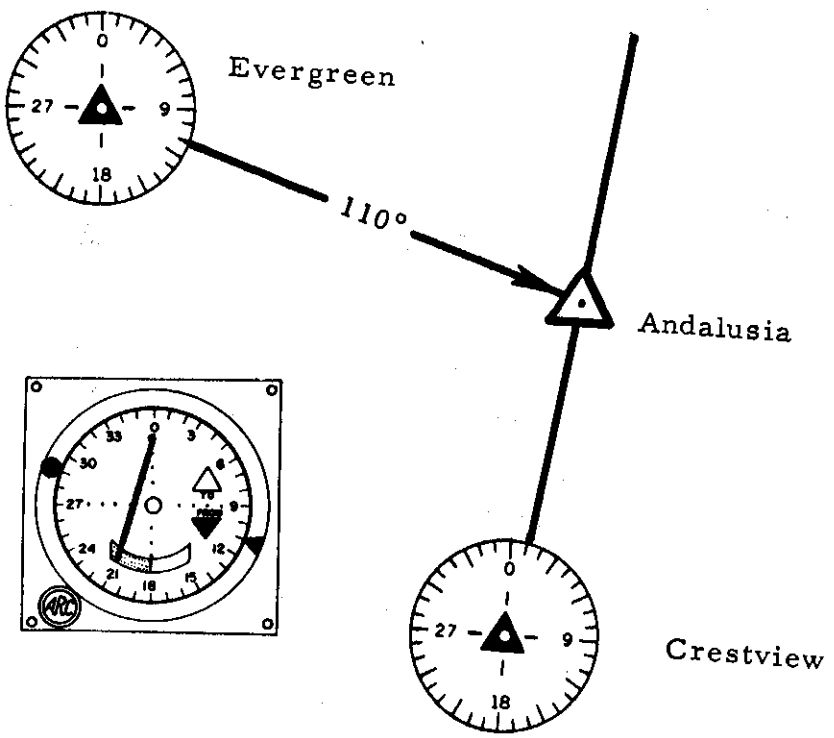
Answer: 2. FROM
3. left
4. left

FRAME 52

In this case a left needle means that the aircraft has not yet reached the intersection.

The pilot must have the ability to look at the left needle and know immediately that he is still short of the intersection.

Although he is not flying a heading of 110°, if he were on a heading of 110° the left needle shows that the 110° radial would be to his left. This indicated to him that his position is _____ (north/south) of the 110° radial.



Answers: south

FRAME 53

A simple rule to remember in fixing intersections is

1. Set up the course selector on the radial published on the chart. This will result in a FROM indication.

2. If the station you have tuned is to your left - and the needle is left, you are still short of the intersection. You are not yet there.

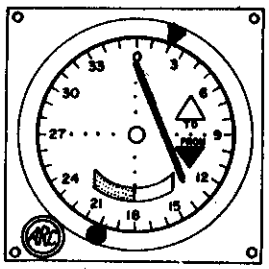
3. Of course, if the station tuned is to your right - the needle should be deflected to your right before you get to the intersection.

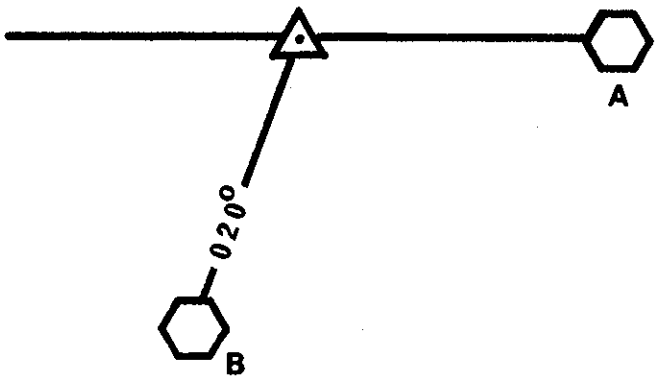
4. WARNING - if you set up the course selector on the radial and get a FROM indication and the needle is deflected opposite from the way described above - then you have passed the intersection.

In the case below the aircraft is flying westbound from station A. The pilot has tuned station B to fix the intersection. The course indicator shows that the aircraft

_____has passed the intersection.

_____has not yet reached the intersection.





Answer: _√_ has passed the intersection

FRAME 54

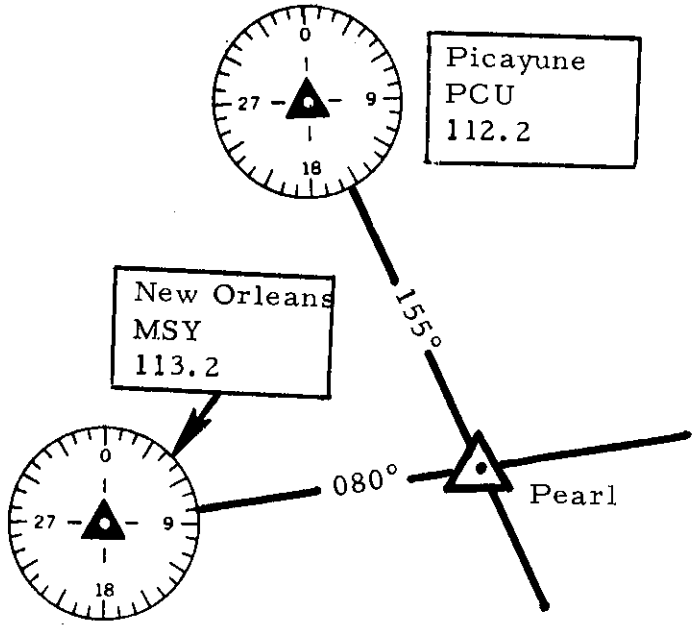
In the diagram an aircraft (not shown) is flying inbound to New Orleans on the 080° radial, following a course of 260°.

To fix the position of the aircraft at Pearl Intersection, the aviator tunes Picayune on a frequency of 112.2 mc and identifies the station (PCU).

The course indicator shows that the aircraft has

_____passed the intersection.

_____not yet reached the intersection.

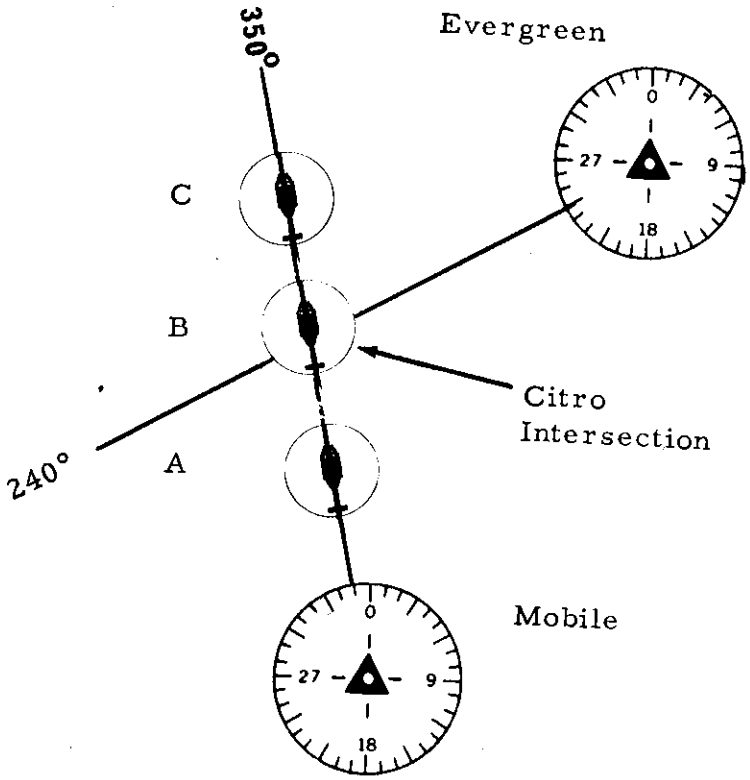


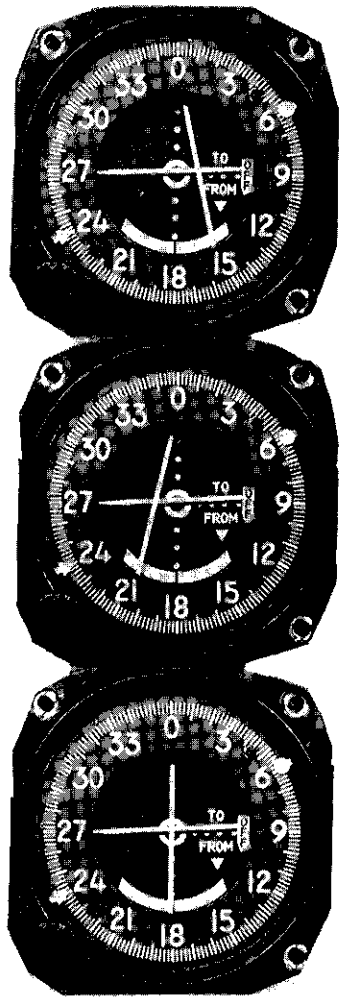
Answer: Has not yet reached the intersection.

FRAME 55

In the situation below, the aircraft is flying outbound on the 350° radial from Mobile (MOB). The aviator has tuned and identified Evergreen (EVR) in order to fix the position of the aircraft over the Citro Intersection.

Match the successive positions of the aircraft (A, B, and C) with the course indicators (1, 2, and 3).



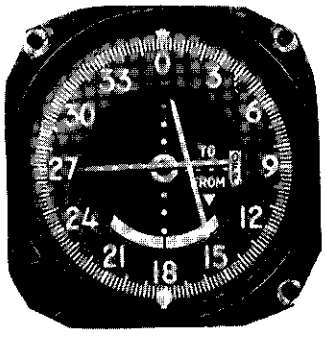


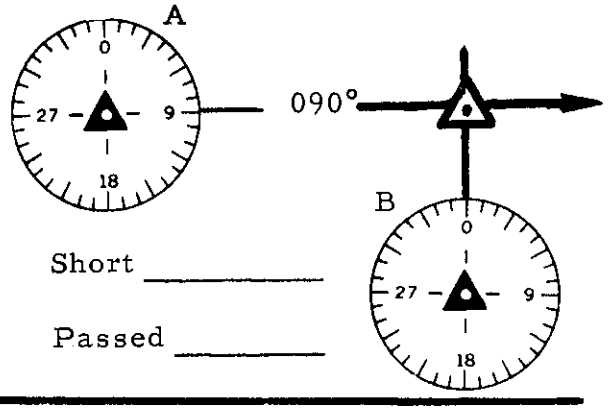
Answers: 1. A
2. C
3. B

FRAME 56

In each case below the aircraft (not shown) is flying outbound from station A with station B tuned to fix the intersection. Look at the course indicator and check if the aircraft has not yet reached the intersection (short) or has passed the intersection.

1.

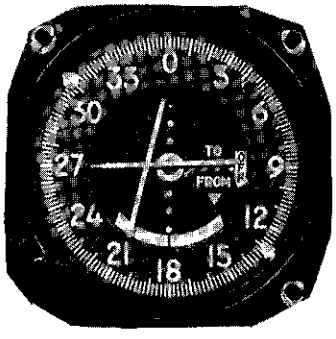


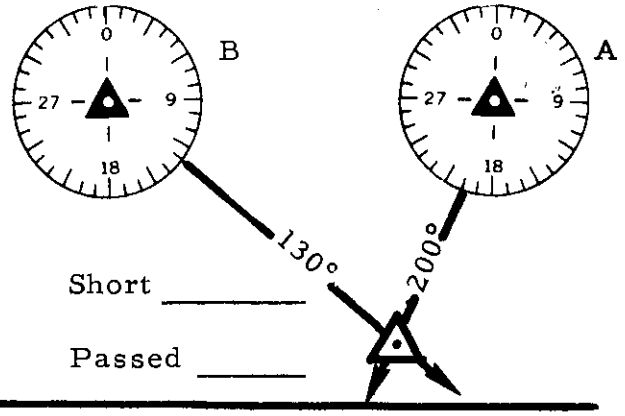


Short _____

Passed _____

2.

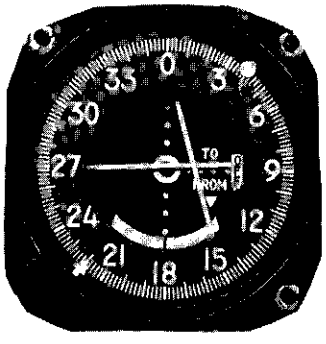


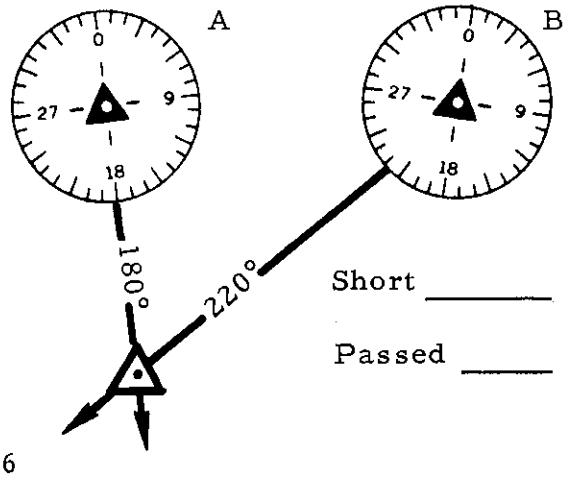


Short _____

Passed _____

3.





Short _____

Passed _____

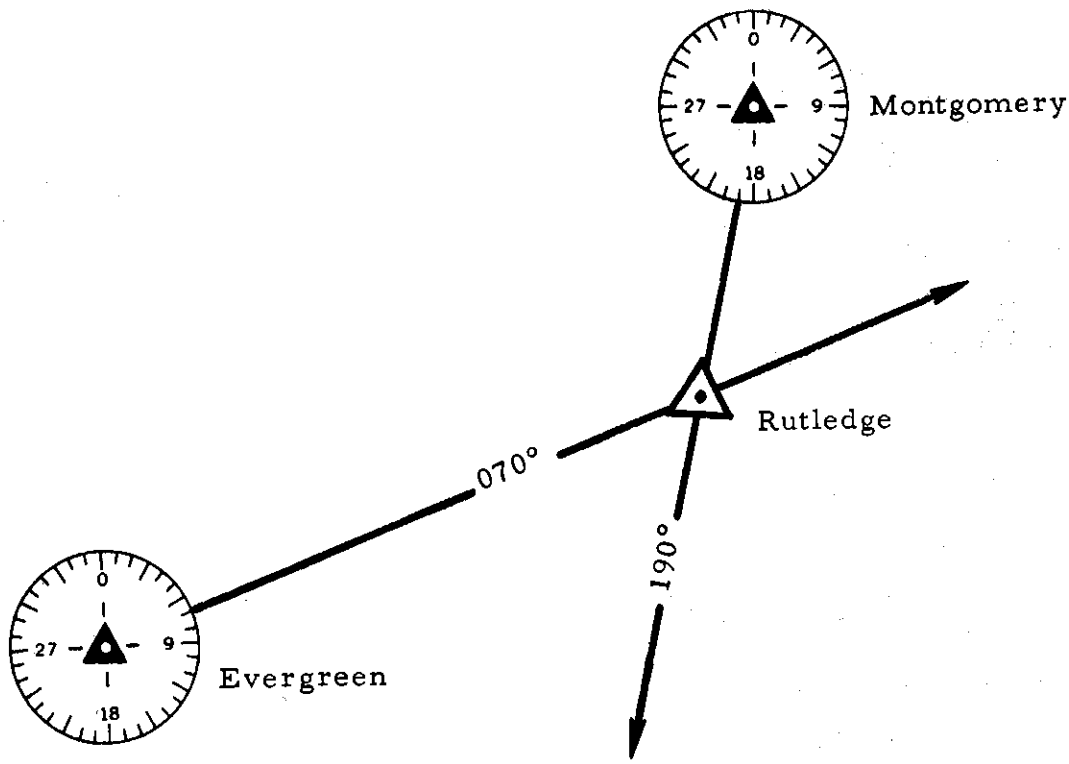
Answers: 1. short
2. passed
3. passed

FRAME 57

In some cases it is necessary to fix an intersection and then turn inbound to the station. The flight path below is from Evergreen to Rutledge intersection and then inbound to Montgomery.

In fixing position at Rutledge intersection, it would not be practical for the pilot to set the course selector arrow on the 190° radial since that goes from Montgomery.

The pilot would set the course selector arrow on _____° and this would cause the sense indicator to show _____.



Answers: 010°, TO

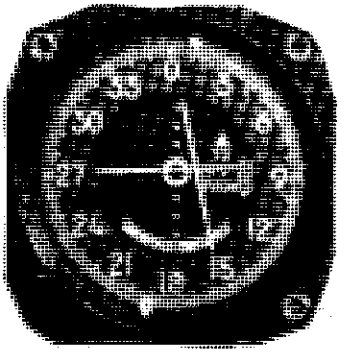
FRAME 58

The pilot has set the 010° course on the course selector resulting in a TO indication. He sees the needle deflected to the right. The rule given in previous frames was based on setting up the radial with a FROM indication.

In this situation the pilot is being told by the instrument that if he were on a heading of 010° inbound course to Montgomery would be to his right. This means the aircraft has

____passed Rutledge.

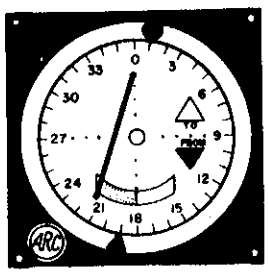
____not reached Rutledge.



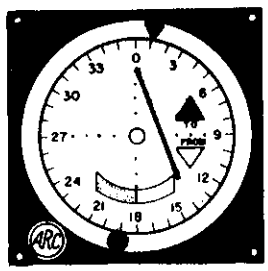
Answers: ✓ not reached Rutledge

FRAME 59

Both instruments below mean that the aircraft has not yet reached Rutledge intersection. In "A" the needle is deflected left because the course selector arrow is set on_____°resulting in the sense indicator showing_____. Why is the needle deflected right on instrument "B"?



A



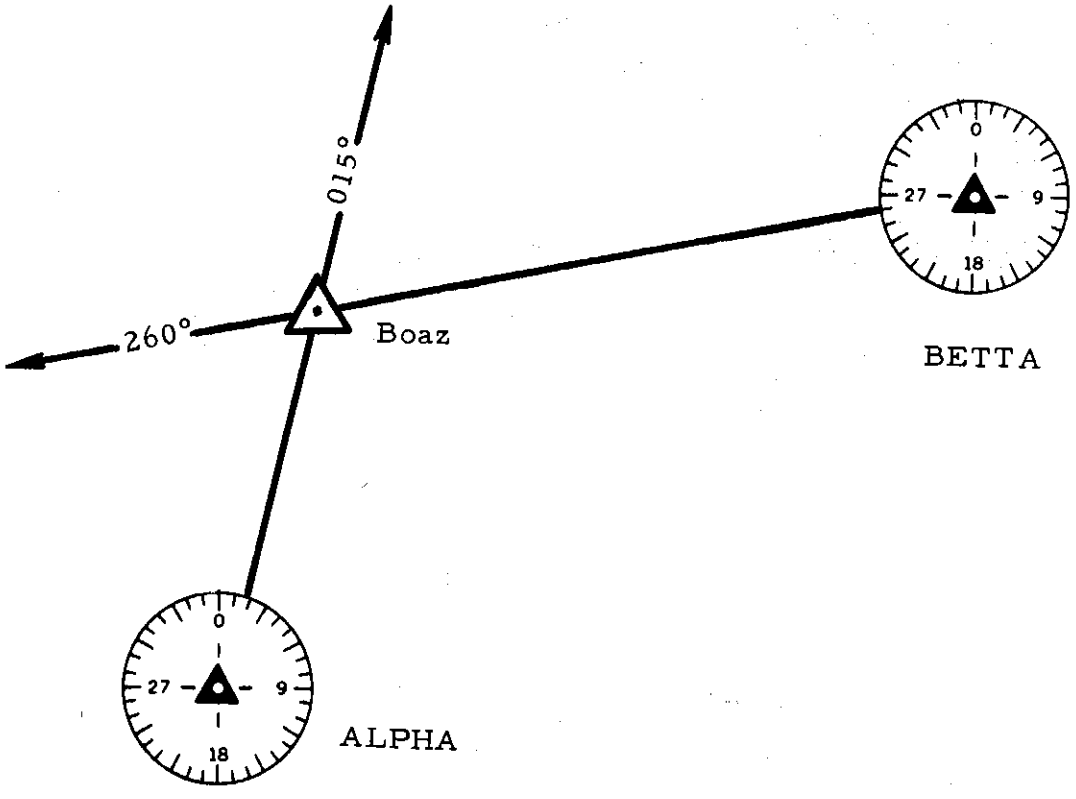
B

Answers: 190°, FROM
because the course selector arrow is set on 010° and the sense indicator shows TO.

FRAME 60

You are flying from ALPHA to BETTA via the Boaz Intersection. Before reaching the Boaz intersection you tune BETTA and set the course selector on 080° which causes the sense indicator to show TO.

You should expect the deviation needle to be deflected to the _____(left/right).



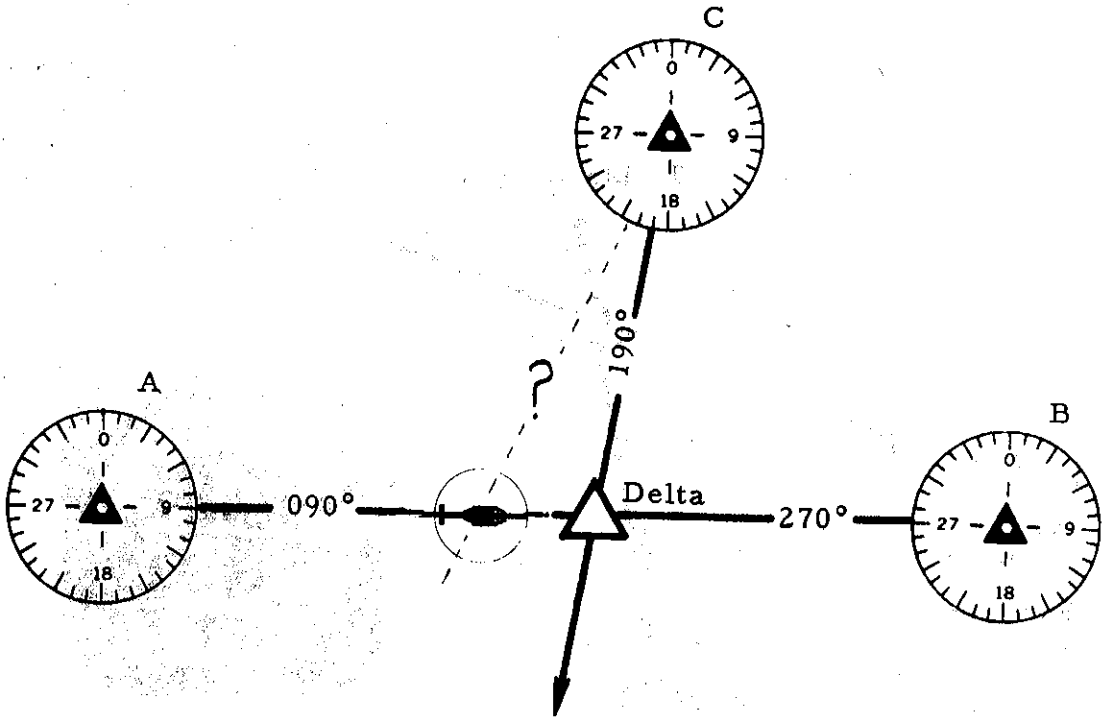
Answers: left

FRAME 61

Another useful technique in checking the position of the aircraft is to find out what radial the aircraft is presently crossing and then compare it with the radial which passes through the intersection.

Before the aircraft below reaches the Delta intersection, it will be crossing radials from station C which are _____ (more than/less than) 190°.

Estimate the radial which the aircraft is crossing at present. _____°.



Answers: more than
approximately the 205° radial

FRAME 62

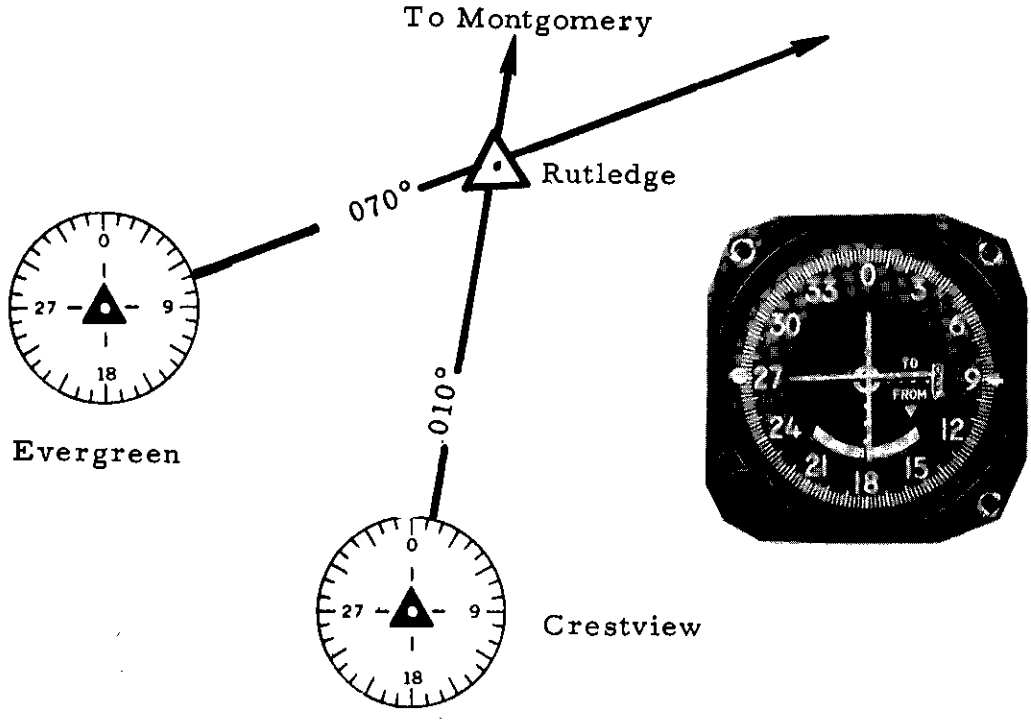
In the diagram, the aircraft is flying outbound from Crestview toward Montgomery. Rutledge Intersection is on the 070° radial from Evergreen.

To verify that the aircraft has not yet reached Rutledge Intersection, the aviator tunes and identifies Evergreen. He then rotates the course selector in the vicinity of radials which are greater than 070°.

The needle centers on the radial shown on the course selector.

What radial (from Evergreen) is the aircraft crossing? _____°

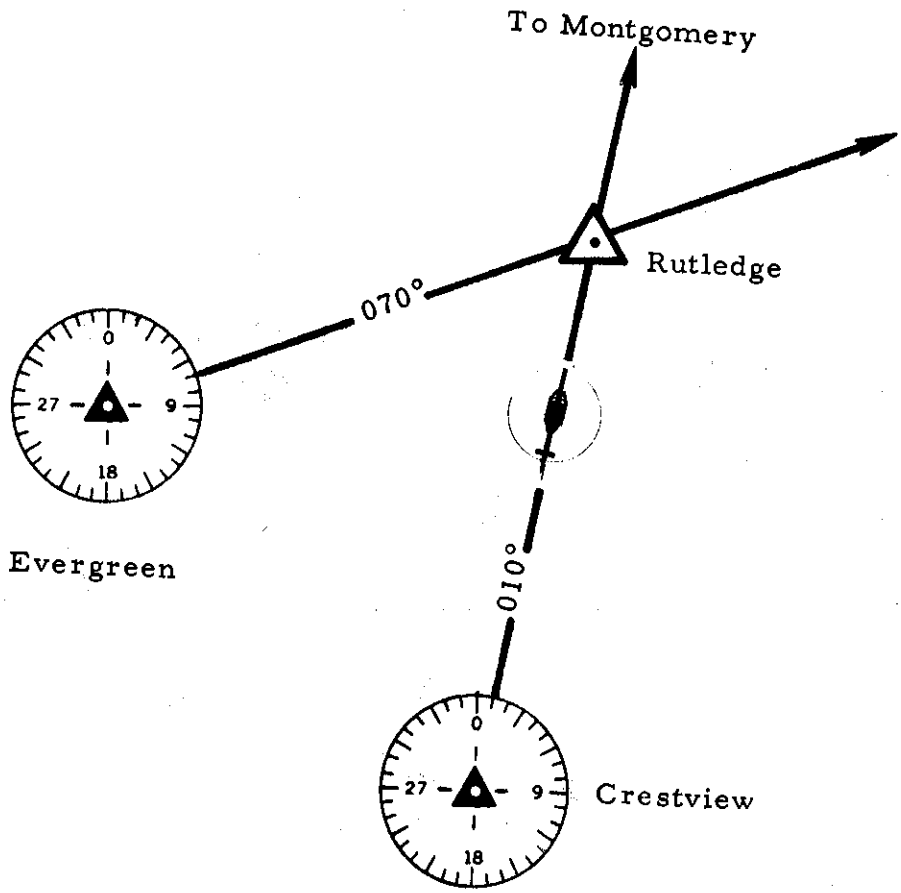
Does this verify that the aircraft has not yet reached Rutledge? _____



Answers: 090°
Yes

FRAME 63

After determining that Rutledge is still ahead of the aircraft, the aviator sets the course selector on the 070° radial in order to fix Rutledge. This causes the needle to deflect to the _____(left - right) since the aircraft is still short of Rutledge.



Answer: left

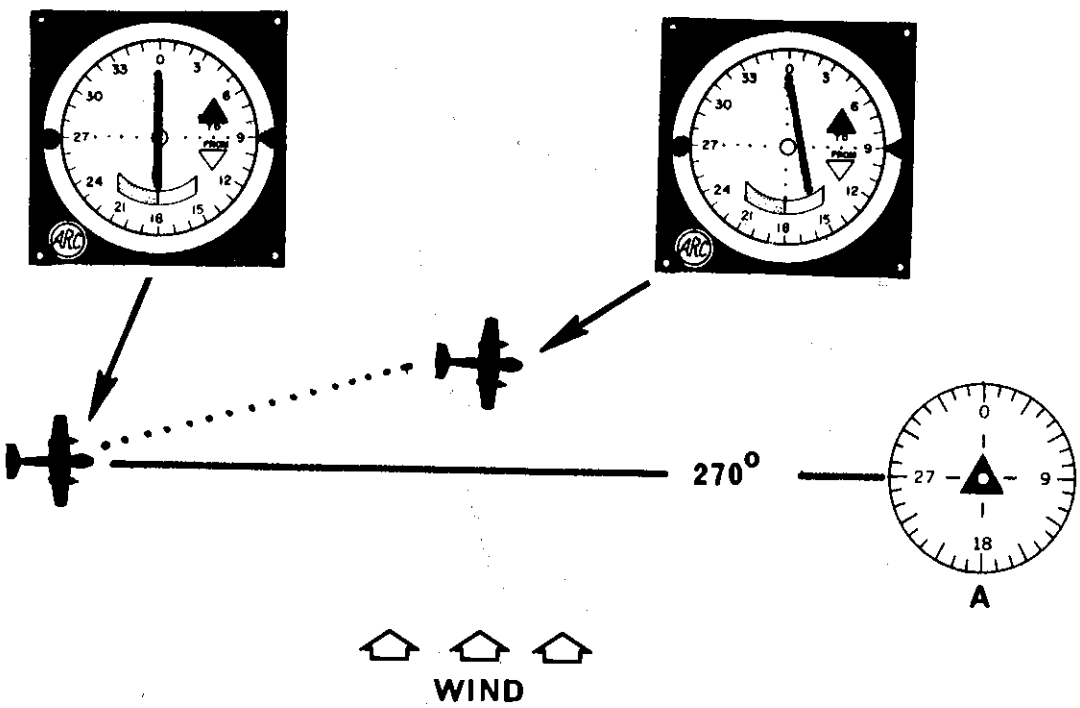
TRACKING FRAME 64

Tracking is a procedure of staying on a desired course by applying drift correction to the aircraft heading to counteract cross winds.

The aircraft is on an inbound course to Station A of 090° holding a heading of 090° - no drift correction is being made.

Right cross winds will blow the aircraft off course. How will the pilot know he has drifted off course? _____

_____.



Answers: needle will swing to right.

FRAME 65

To return to track the pilot turns toward the needle. The standard correction to return to track is:

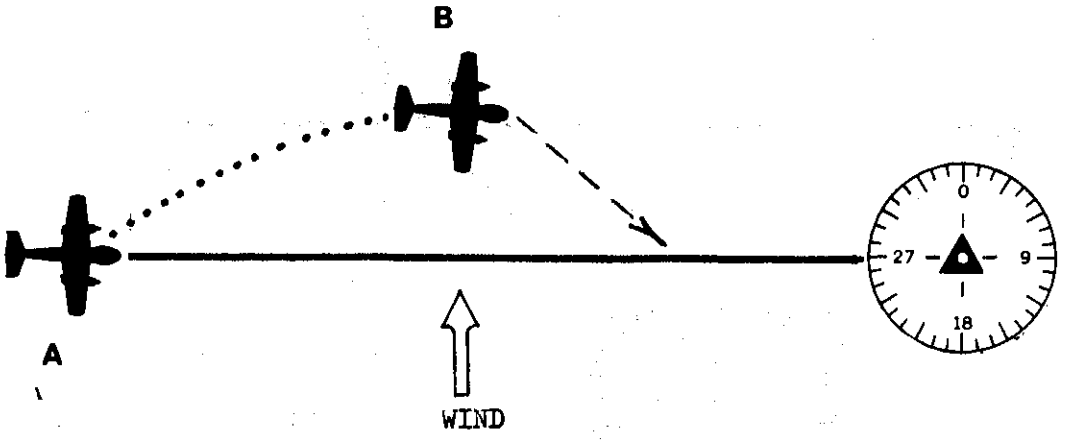
20^{o} - if True Airspeed is over 90 knots.

30^{o} - if True Airspeed is 90 knots or less.

In the case below, the pilot was holding a heading of 090^{o} but was blown off course to point B. He must now correct by turning toward the course either 20^{o} or 30^{o} depending on his airspeed.

If his airspeed is over 90k, he would turn to a heading of_____^{o}

If his airspeed is 90k or less, he would turn to a heading of_____^{o}

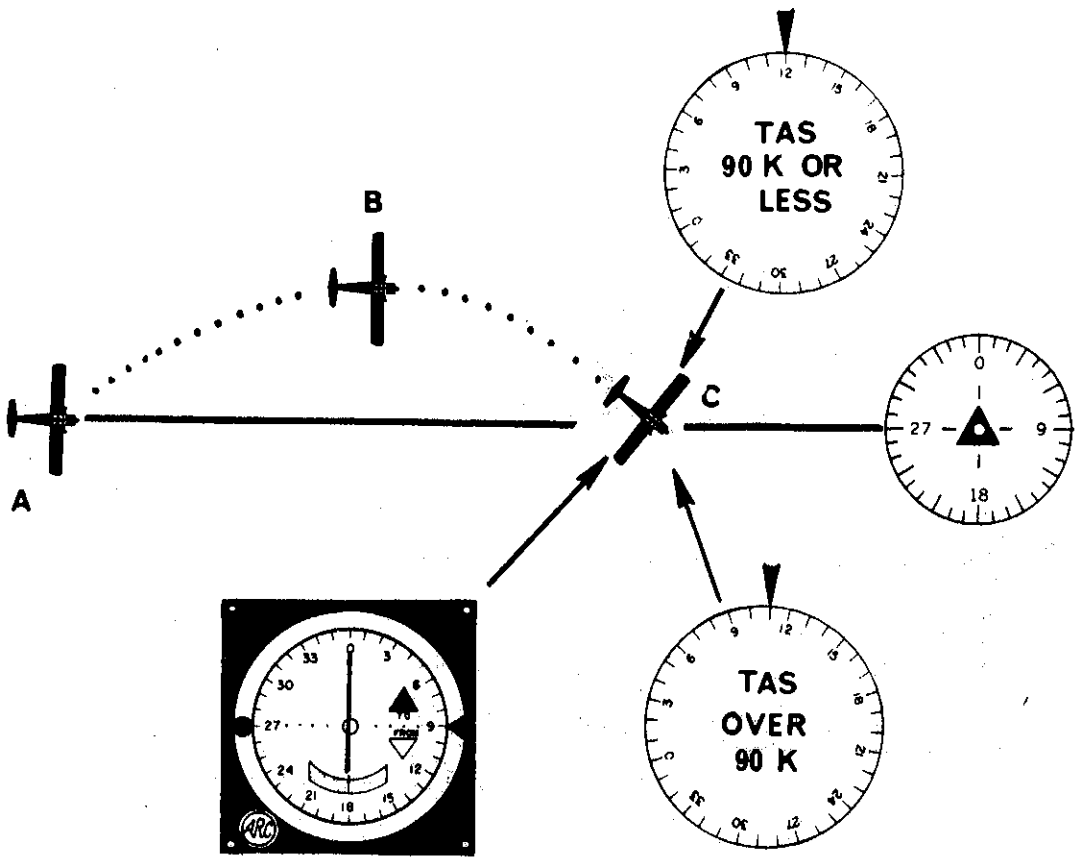


Answer: 110° (TAS over 90k)
120° (TAS 90k or less)

FRAME 66

How does the pilot know that he has returned to the track? (point C below) _____

What will happen if he continues to hold the same heading he used to get back on track? _____



Answer: needle returns to center.
aircraft will fly past track - needle will swing to left.

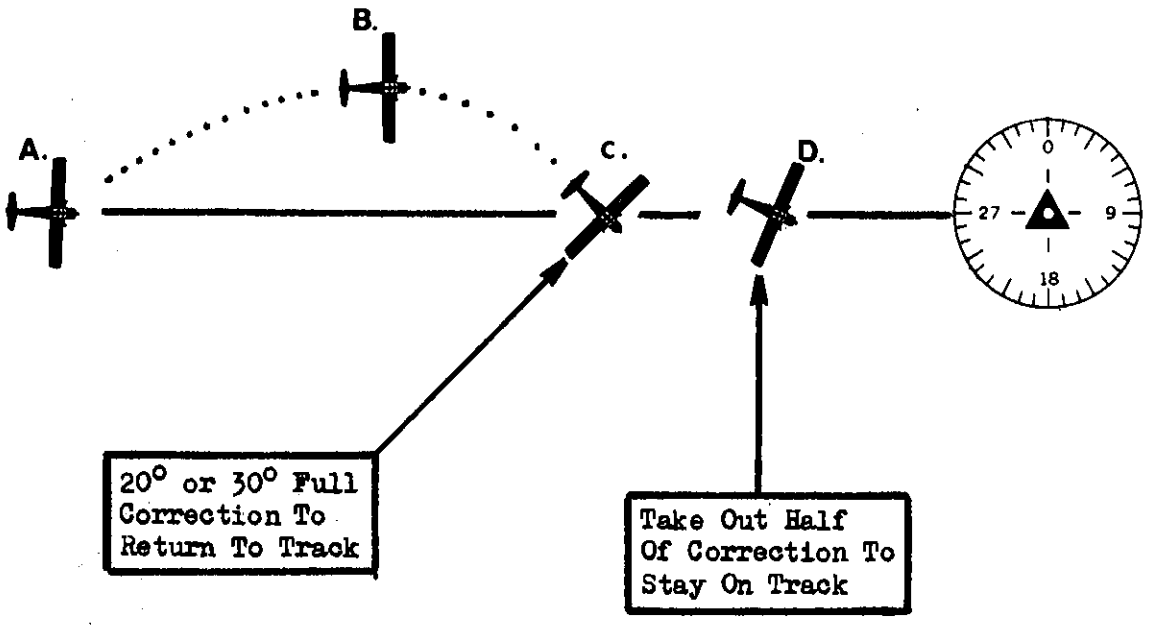
FRAME 67

After returning to track the pilot takes out half of the correction he used to get back on track.

At point D below, the pilot would turn to a new heading of:

_____° (TAS over 90 knots)

_____° (TAS 90k or less)

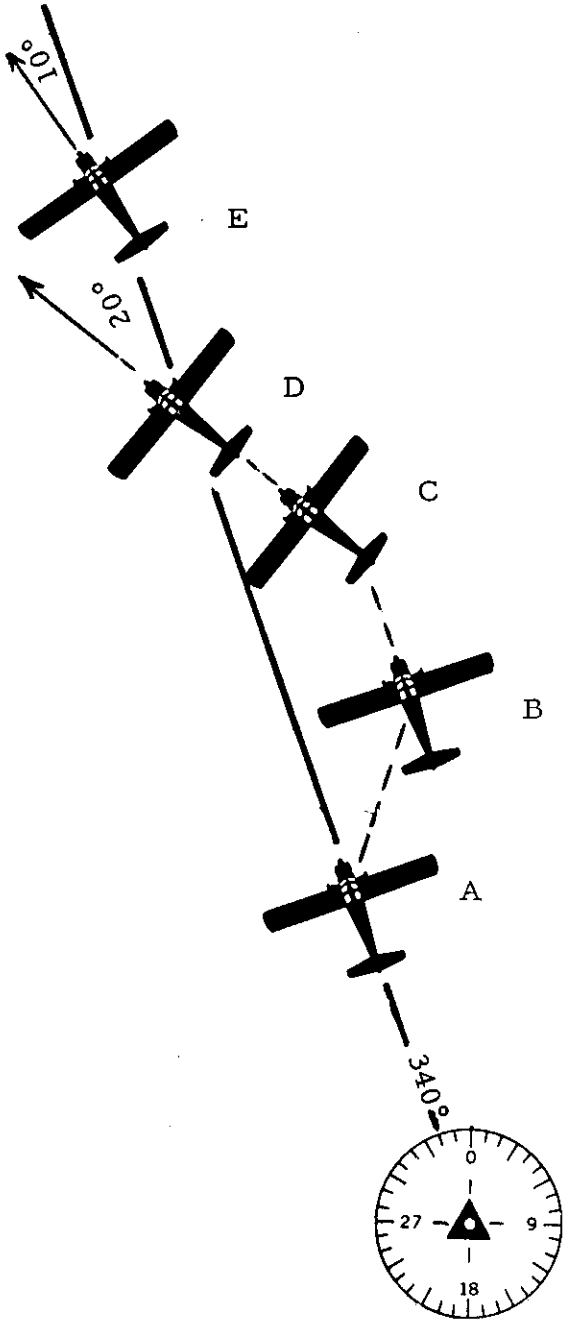


Answers: 100° (TAS over 90k)
105° (TAS 90k or less)

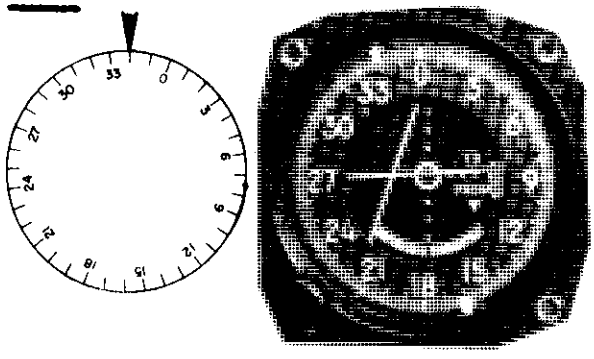
FRAME 68

NOTE: IF YOU ARE FLYING 90 KNOTS OR LESS GO TO THE NEXT PAGE.

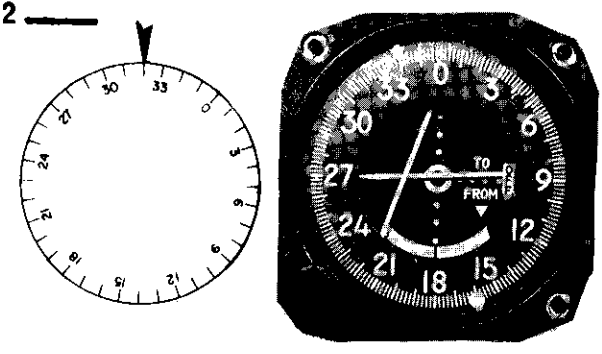
Match the instruments (1, 2, and 3) with a corresponding position of the aircraft. (Note: Only 3 aircraft positions will match.)



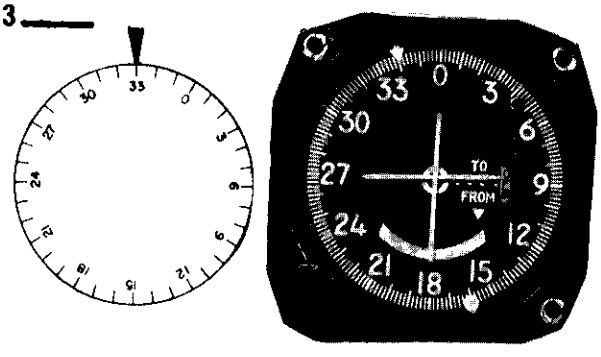
1 ___



2 ___



3 ___

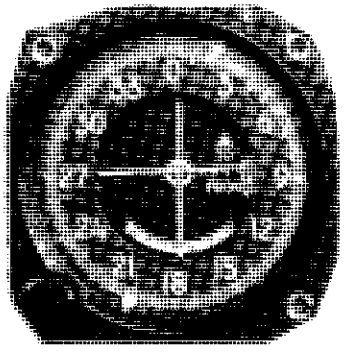


Answers: 1. B
2. C
3. E

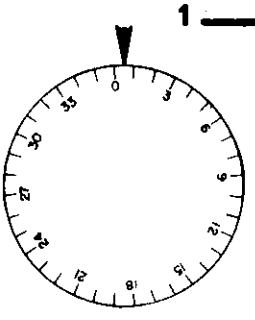
FRAME 69

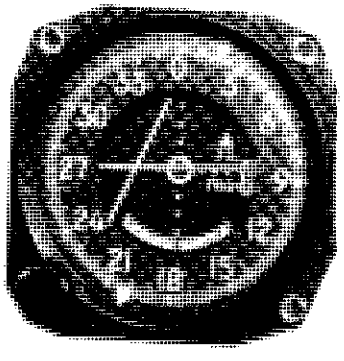
NOTE: If your airspeed is 90 knots or less - do this frame. If you did the last frame - skip this - go to the next page.

Match the instrument readings (1, 2, & 3) which correspond to the helicopter positions. (Only 3 will match)

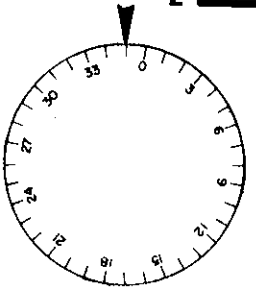


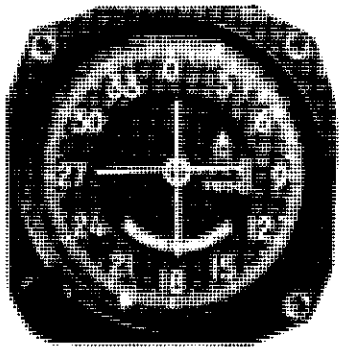
1 ___



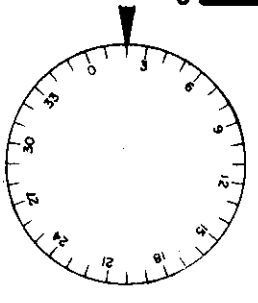


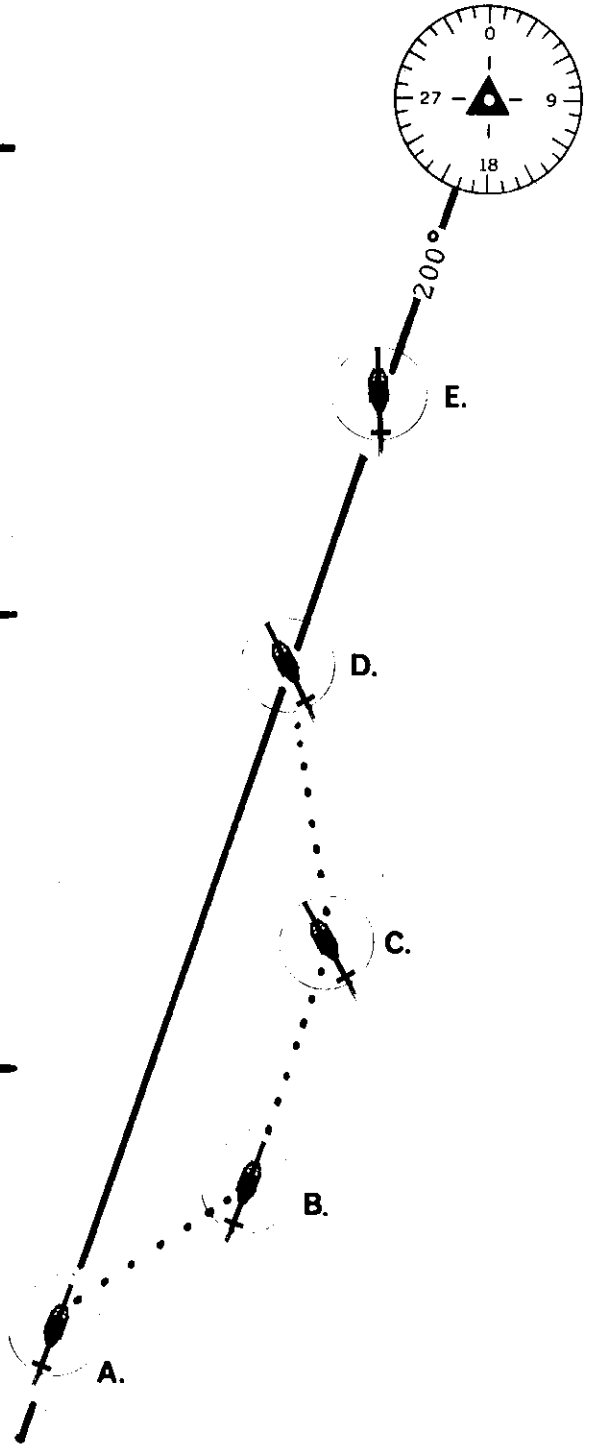
2 ___





3 ___





Answers: 1. E
2. C
3. A

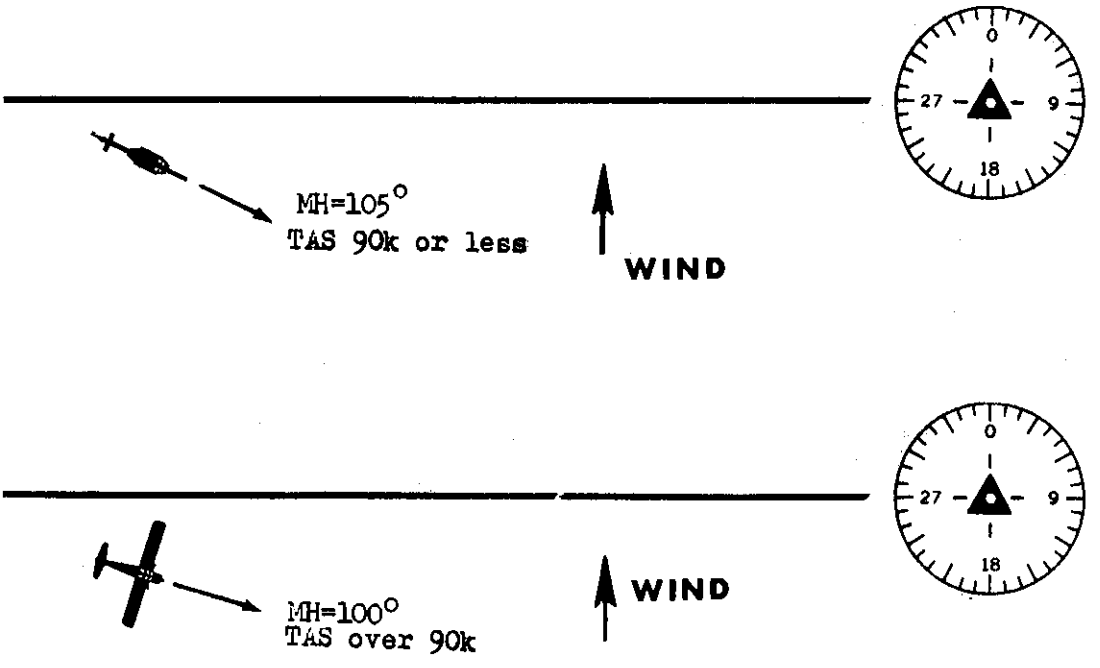
FRAME 70

Your initial drift correction after returning to track is 10° or 15° depending on airspeed. Occasionally, this initial crab angle will be too large (light winds) or too small (strong winds) and your aircraft will drift off course once more.

Assume your initial crab angle was too large (light winds) and you flew off course (upwind). A simple way to get back on course is to turn parallel to the intended track and let the wind drift take you back.

In either situation below you would turn to a heading of: _____°.

How will you know when you have returned to track once again?



Answers: 090°
needle returns to center

FRAME 71

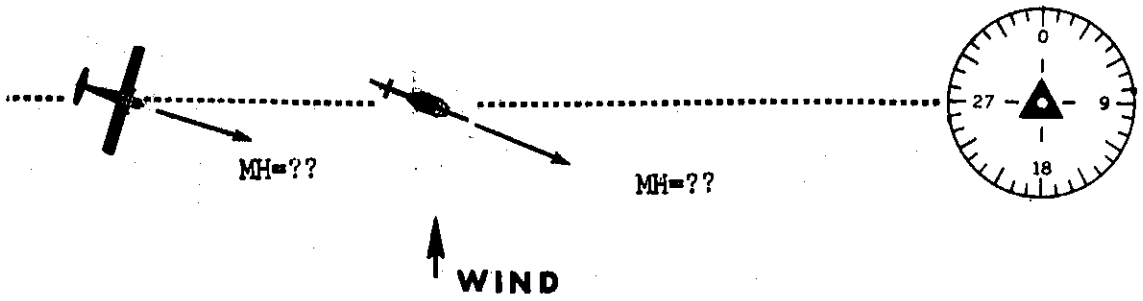
After returning to track again, you must apply a smaller crab angle. The first crab angle you tried was 10° (TAS over 90k) or 15° (TAS 90k or less). This time try:

5° if your TAS is over 90k.

10° if your TAS is 90k or less.

Turn to a new heading of: _____° (for TAS over 90k)

_____° (for TAS 90k or less)



Answers: 095° (TAS over 90k)
100° (TAS 90k or less)

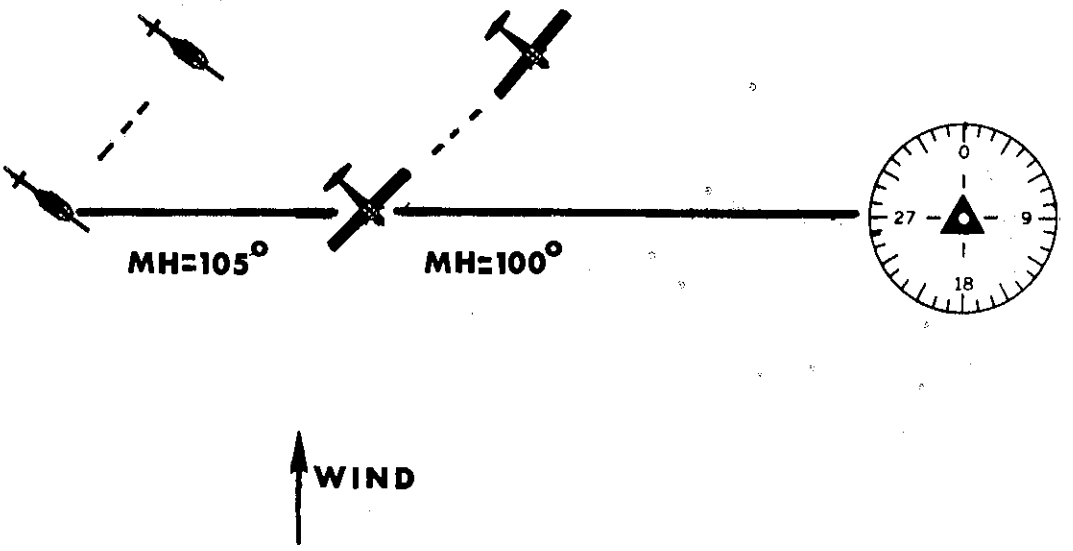
FRAME 72

In some cases the initial crab angle of 10° or 15° (depending on airspeed) may not be enough because of strong winds. In the case below, the pilot was holding his initial crab angle but was later blown off track.

To get back he should once again take a 20° or 30° cut at the tract (depending on airspeed).

Airspeed over 90k - turn to a heading of _____°

Airspeed 90k or less - turn to a heading of _____°



Answer: 110° (TAS over 90k)
120° (TAS 90k or less)

FRAME 73

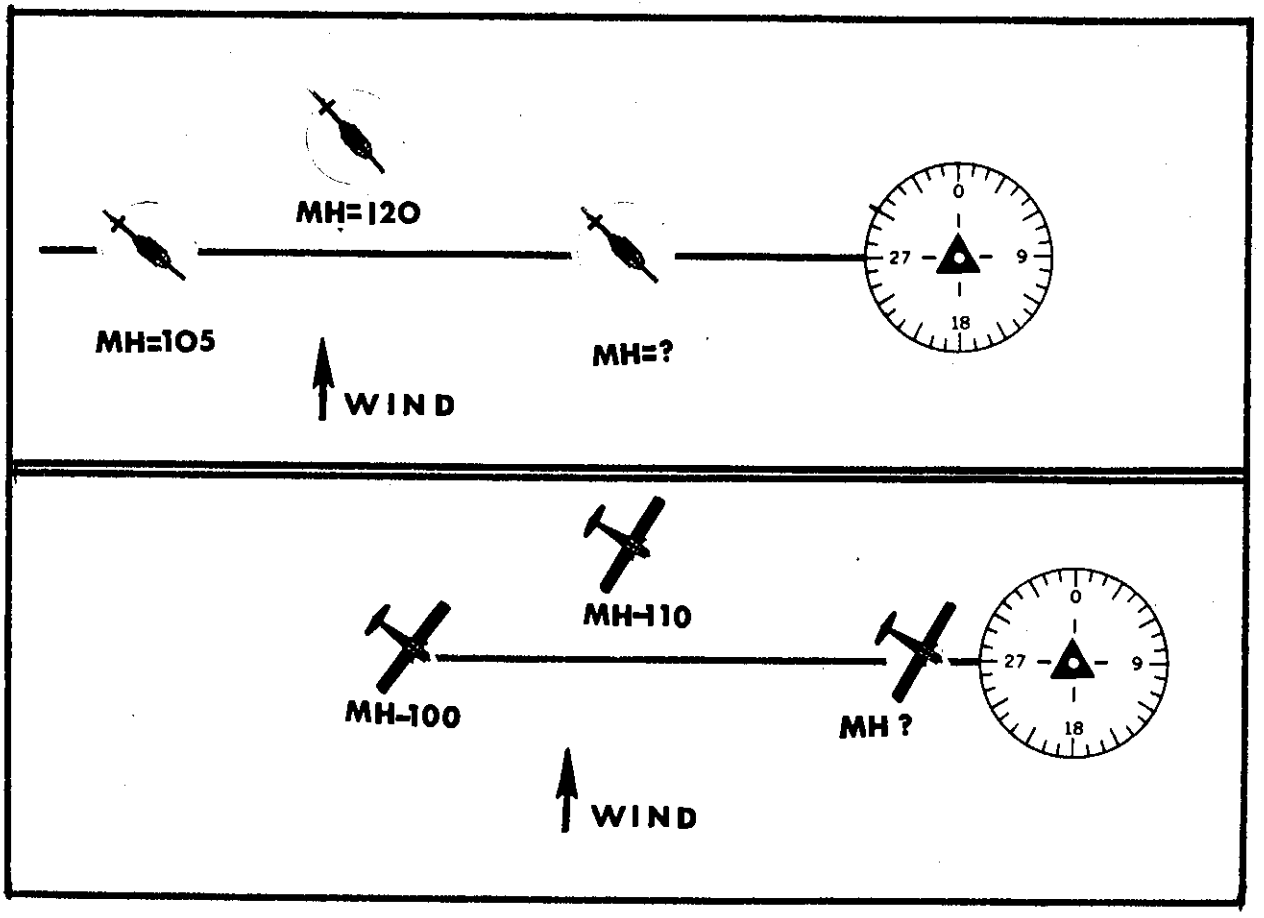
After returning to the track, you must now apply a larger crab angle. For TAS over 90 k - try 15°

For TAS 90k or less - try 20°

The pilot below would turn to a heading of

____ (TAS over 90k)

____ (TAS 90k or less)



Answers: 105° (TAS over 90k)
110° (TAS 90k or less)

FRAME 74

REVIEW

1. You are tracking inbound on the 220° course to the station. Right crosswinds blow you off track. You know this because the needle is deflected outside the doughnut to the _____(left/right).

2. At this time you turn _____(left/right) toward the track to a heading of _____° (TAS over 90k), OR _____ (TAS 90k or less).

3. The initial correction brings you back to track. Now you apply a crab angle of _____° (TAS over 90k), OR _____° (TAS 90k or less) The crab angle puts you on a new heading of _____° (TAS over 90k) OR _____° (TAS 90k or less).

4. If the crab angle above is too much - you will fly off track into the wind. To get back to track you turn to a heading of _____°.

5. If the crab angle is too little - you will drift off track downwind. To get back to track you again apply a correction of _____° OR _____° depending on your airspeed.

Answers:
1. right
2. right, 240° (TAS over 90k), 250° (TAS 90k or less)
3. 10° (TAS over 90k), 15° (TAS 90k or less)
   230° (TAS over 90k) 235°(TAS 90k or less)
4. 220°
5. 20°, 30°

FRAME 75

REVIEW

You are flying a track of 270° to a station. The wind is from the north (360°).

1. What direction would you expect to be blown off track? _____ (Right/left).
2. What direction would you turn to return to track? _____ (Right/left).
3. How many degrees would you turn to return to track? _____
4. What would your heading be? _____.
5. How would you know when you were back on track? _____ _____.
6. When back on track, what heading would you take up? _____.

Answers: 1. left (south)
2. right
3. 20° (TAS over 90), 30° (TAS 90k or less)
4. 290°, or 300° (depending on airspeed)
5. needle returns to center
6. 280°, or 285° (depending on airspeed)

FRAME 76

Recommended angles in this program must be changed in some cases. Example: Your TAS is 70 knots and you have a direct crosswind of 50 knots. For intercepting and maintaining a track you would expect to use:

____ larger angles.

____ smaller angles.

Answers: ✓ larger angles

FRAME 77

In another situation assume your TAS is 180 knots and you have a crosswind of 15 knots. You would expect your crab angle to be quite

____ large

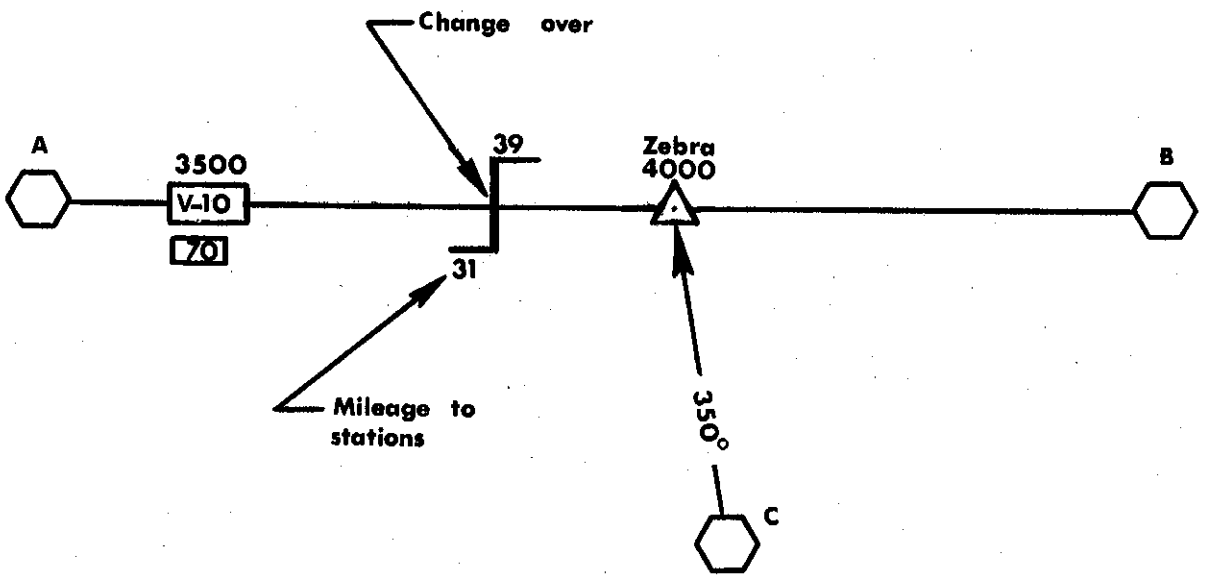
____ small

All tracking procedures in this program are guides. Since winds and airspeeds vary in every situation, pilots must modify the standard tracking procedures as required by the situation. Only practice will permit you to develop tracking skill.

Answer: ✓ small

FRAME 78

While tracking along an airway you will reach a point between stations where it will be necessary to change stations and tune ahead to the next station. Change-over points are frequently shown on charts as below with the mileage indicated to both stations. These change-over points are based on the terrain and power output of the station. They are flight-checked by the FAA to insure that a reliable signal can be received from each station at the MEA. At the change-over point below, the mileage to station A is_____nm and to station B is_____nm. The MEA along the airway between the two stations is_____feet. The minimum altitude for receiving station C in order to fix position over the Zebra intersection is _____feet.

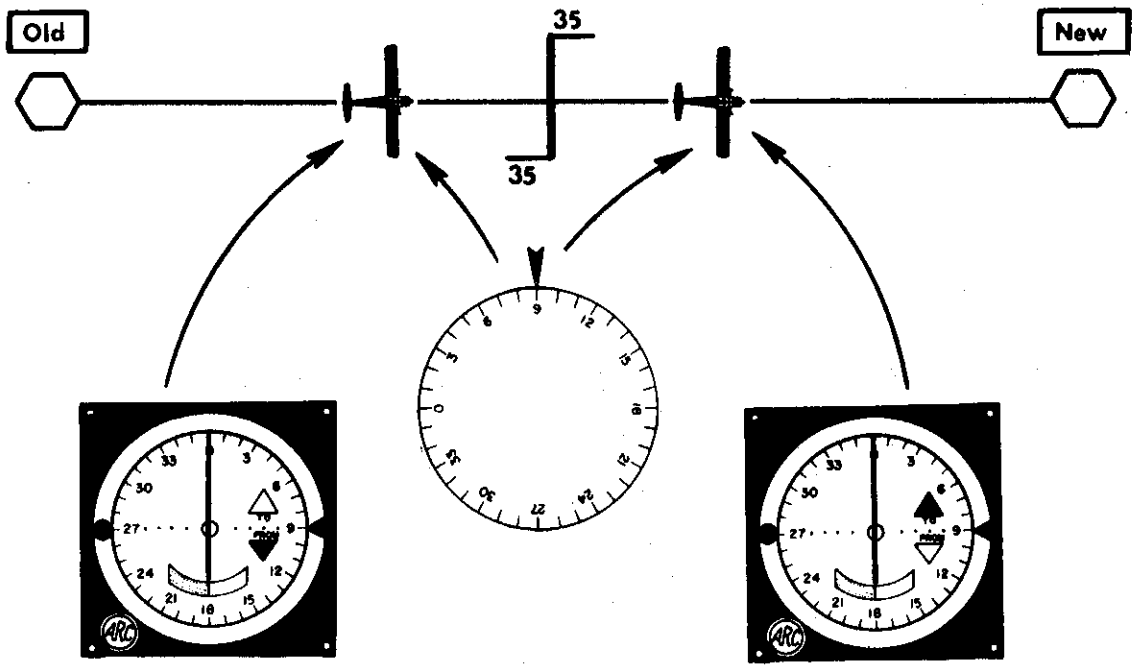


Answers: 31nm, 39nm, 3500 ft, 4000 ft.

FRAME 79

When tuning ahead to a new station, the only thing the pilot normally does is tune the new frequency and identify the station.

Unless there is an actual change in the direction of the course, the heading should not change and the course selector setting does not change. But, the sense indicator _____.



Answers: changes from FROM to TO.

FRAME 80

REVIEW

1. As the aircraft passes over the station while tracking, the sense indicator

   A. changes from TO to FROM.
   B. changes from FROM to TO.

2. When the pilot tunes ahead to the next station while tracking, the sense indicator

   A. changes from TO to FROM.
   B. changes from FROM to TO.