VOR Made Simple

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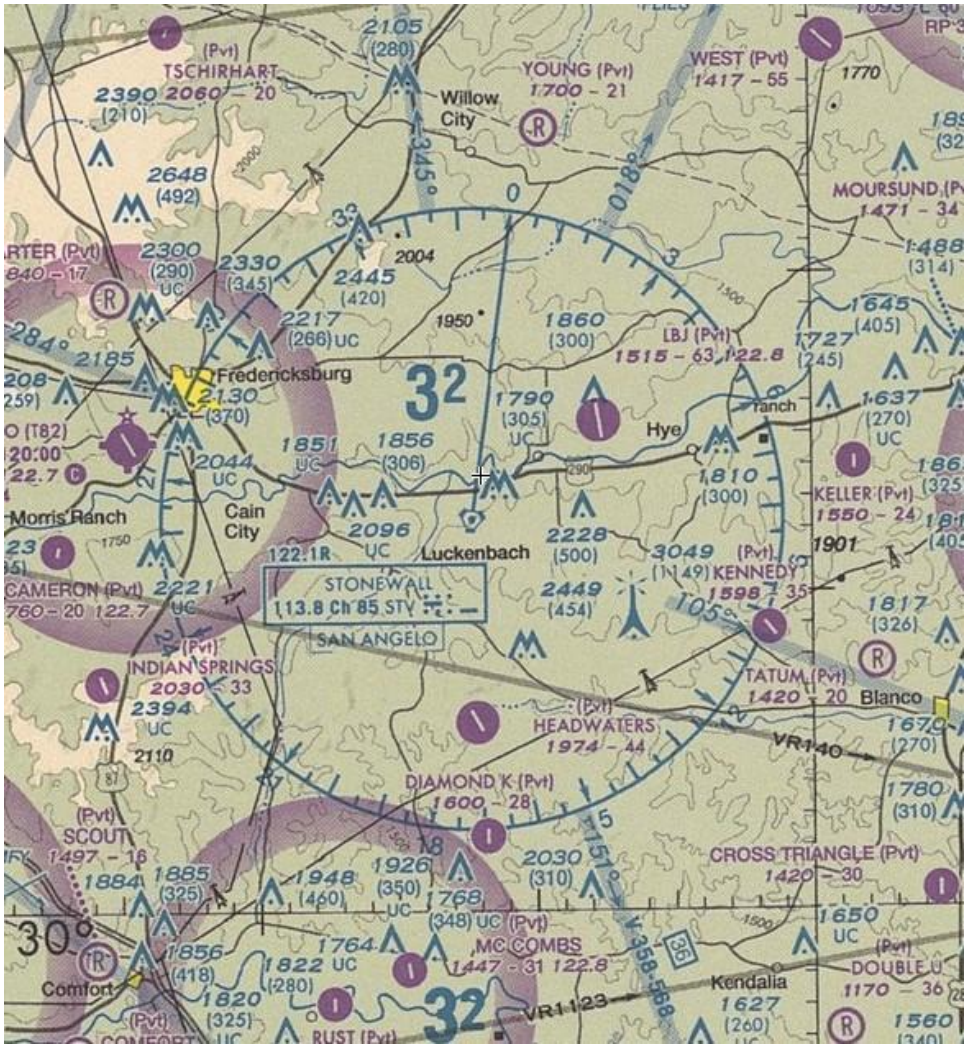
VOR System

- Navigation Information
- Morse Code ID
- Voice (sometimes)
- Limitations
  - Line of Sight
  - Range

VHF Omni-Range (VOR)

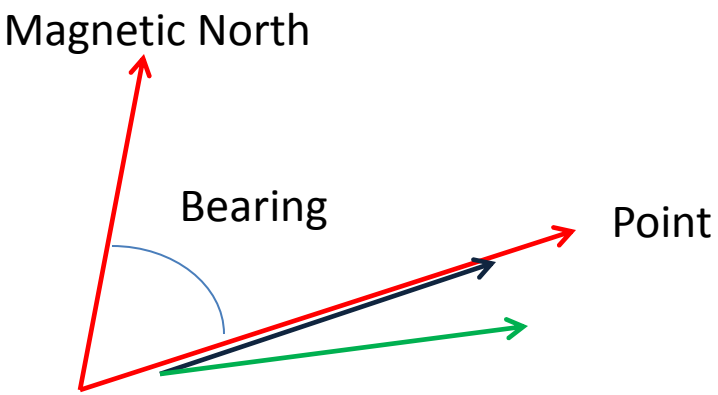
VOR on VFR Sectional

- Navigation Information is Referenced to Magnetic North
- There are 360 ‘Radial’s’
- Each Radial Equates to a Degree
- Radial is a Magnetic Direction ‘Away’ From the VOR
- Box Gives Information
  - VOR Name
  - Frequency
  - ID
  - Morse ‘Cheat Sheet’



Navigation Terms

- Magnetic Bearing (normally we just say Bearing)
  - Angular Measure from Magnetic North to a Point



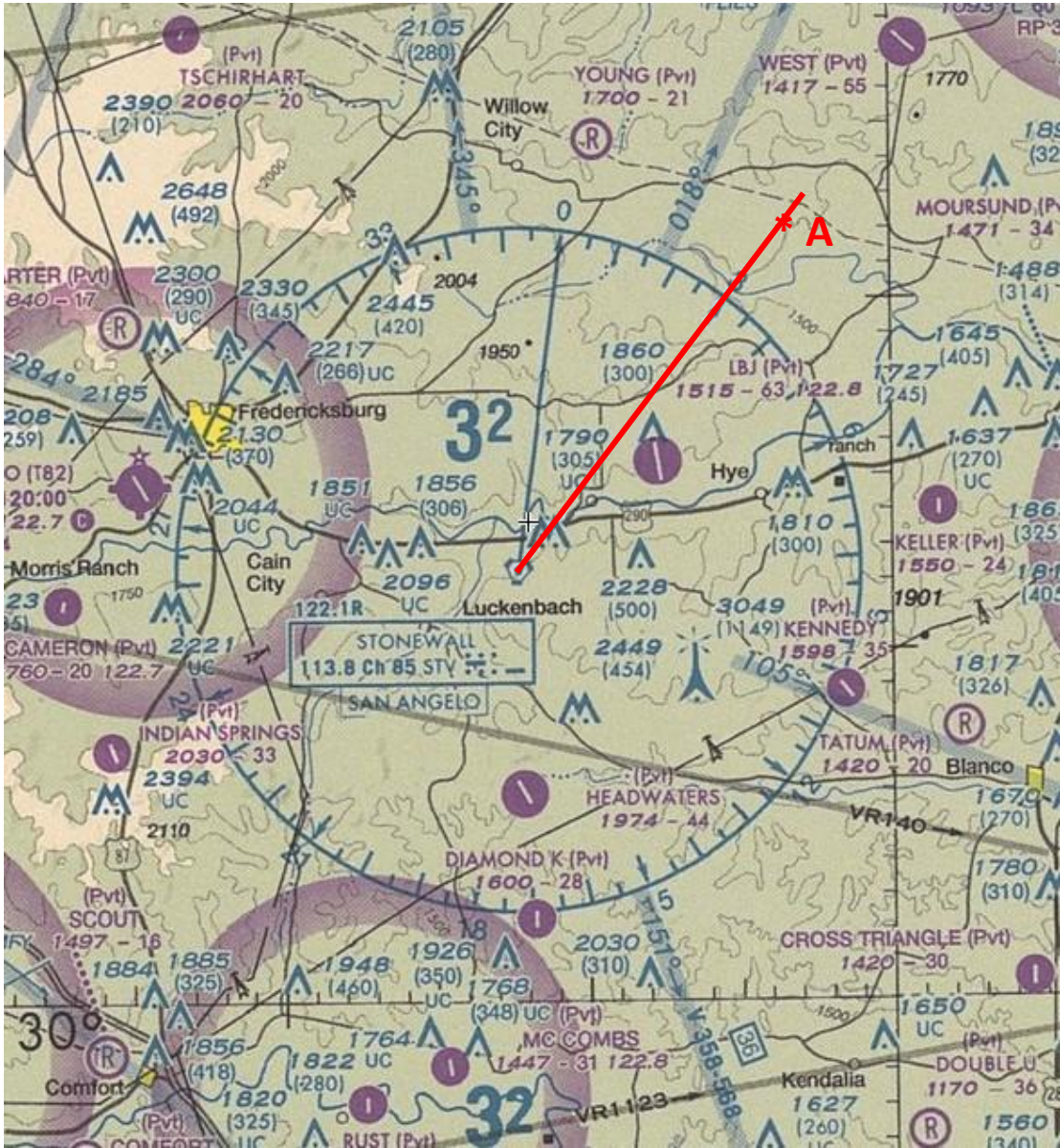
- Magnetic Course – Line Along Bearing to be Flown (blue)
- Track – What is Actually Flown (green)

Navigation Terms (cont.)

- Heading – Direction we Point Aircraft in Order to Track a Desired Course
  - Normally We Adjust Heading (for Wind) to Make our Track Agree with Our Desired Course

Radial to Bearing Relationship

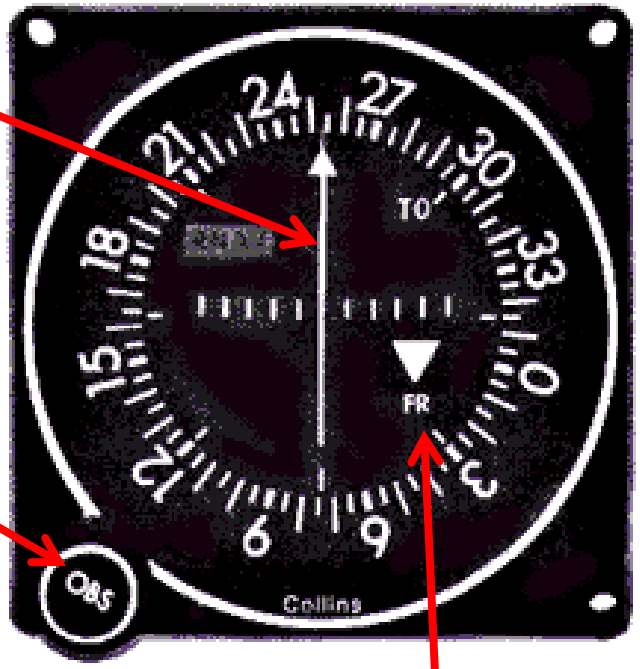
- What Radial is ‘A’ On? _____
- What is Bearing from ‘A’ to STV? _____



VOR Display

Course Deviation Indicator (CDI)

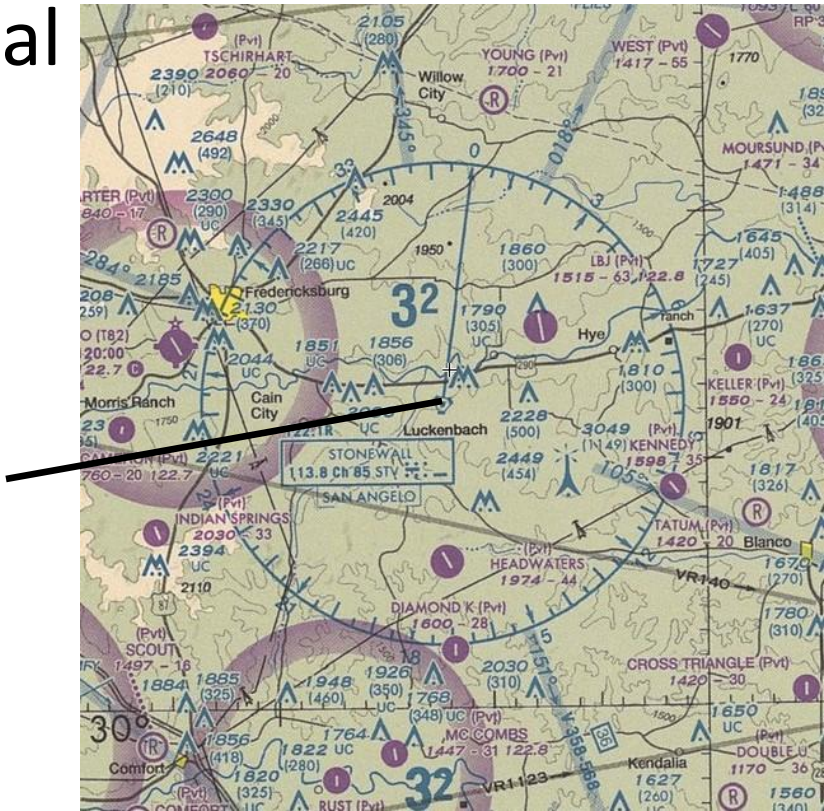
Omni Bearing Selector (OBS)



Ambiguity Indicator (TO / FROM)

What Radial Am I On?

- Turn OBS Knob Until CDI Needle Centers With a From Indication
- Read Radial at Top of CDI
- You are On the 254 deg Radial

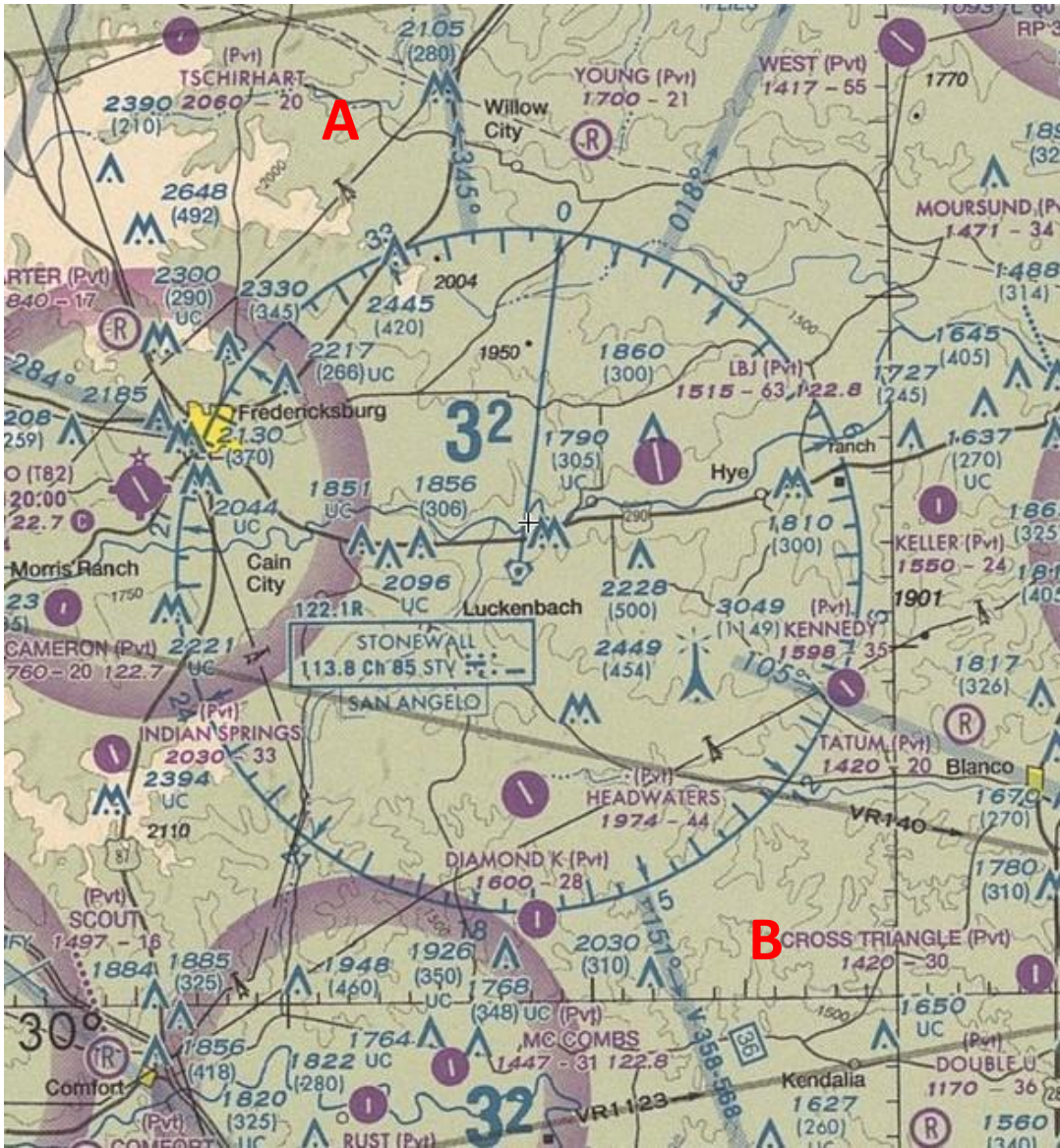


Use of VOR – Some Rules

- We Can Only Fly To or From a VOR Station
- The CDI Will Center With Two (2) Settings of the OBS
  - One With a FROM Ambiguity
  - The Other With a TO Ambiguity
- Use The TO Ambiguity to Fly TO the VOR
- Use The FROM Ambiguity to Fly FROM the VOR
- Aircraft Heading Has No Effect on VOR Indication

What Are We Doing Here?

- Aircraft Heading is 150 deg
- Where are We On the Map? A or B



To Track

- **<u>Inbound</u>**: Heading Agrees with OBS, CDI Centered and TO Flag On

To Track (cont.)

- **<u>Outbound</u>**: Heading Agrees with OBS, CDI Centered and FROM Flag On

Student Exercise – Draw VOR Instrument

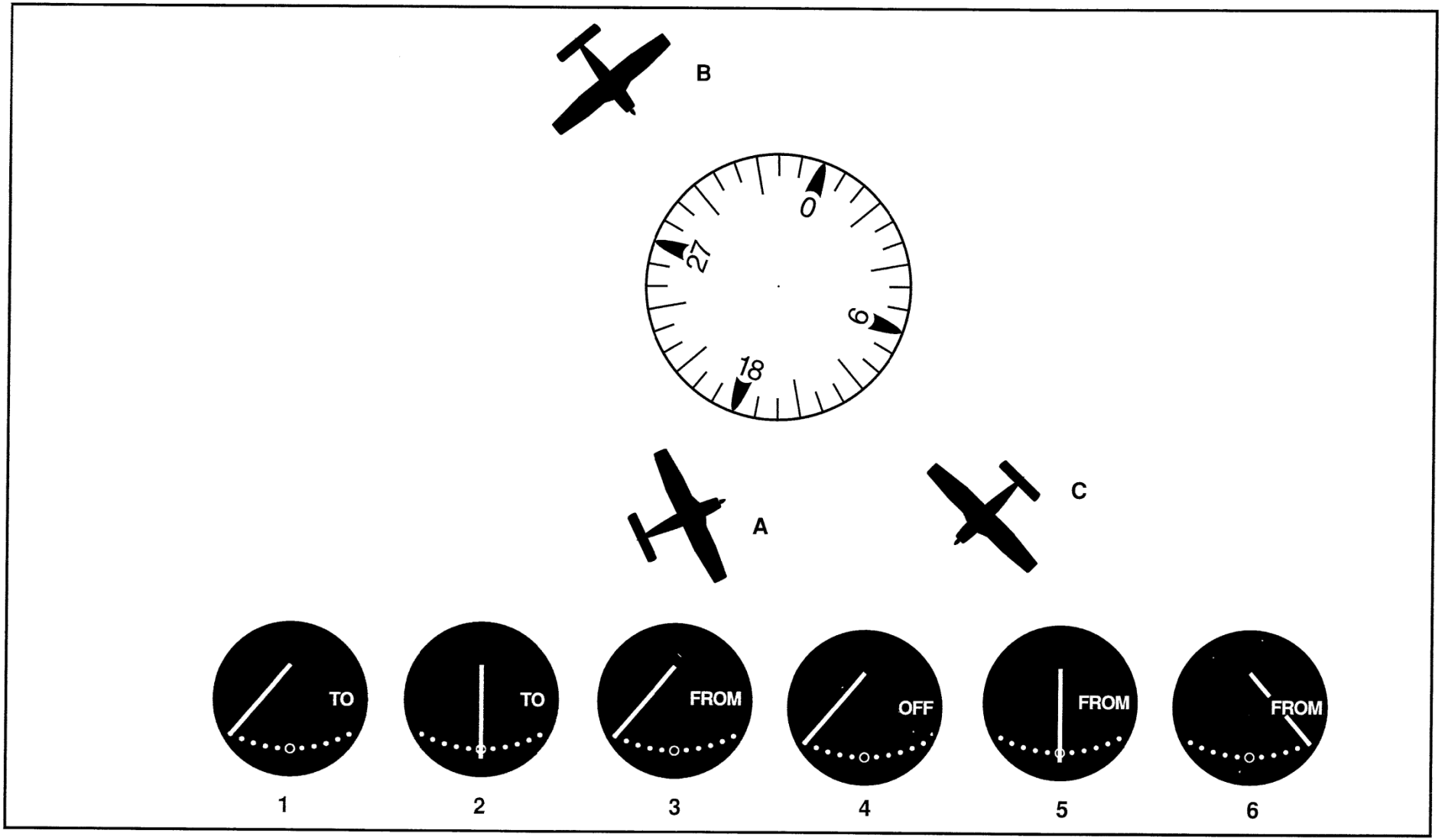
Instrument Interpretation

- Each Dot Represents 2 degrees
- If the Center ‘Donut’ is to the Right of the CDI Needle, You are Right of Course
- In This Example You are on the _____ Radial

Instrument Interpretation

- What is the?
  - Desired Course
  - Heading to Intercept
  - Degrees Off Course
  - Desired Radial
  - Radial You are On

Review VOR



Questions 34, 35, and 36

Review (cont.)

34. If airplane A has 090° set in the course selector, its VOR indications will correspond to those of instrument

    1. 1.
    2. 3.
    3. 4.

35. If airplane C displays the VOR indications shown on instrument 2, the course selector will read

    1. 120°.
    2. 160°.
    3. 300°.

36. If airplane B has 280° set in the course selector, the VOR indications will correspond to those of instrument

    1. 1.
    2. 3.
    3. 6.

How to Intercept and Track

- If Desired Course is ‘x’ Degrees Off, Correct Initially With a Correction Angle of 3x
- E.g., You are 4 Dots to Right of Centerline (8 Degrees) Make a Correction of 24 degrees to the Left
- If More Than 10 Degrees Off, Make a Correction of 45 Degrees

Intercept and Track (cont.)

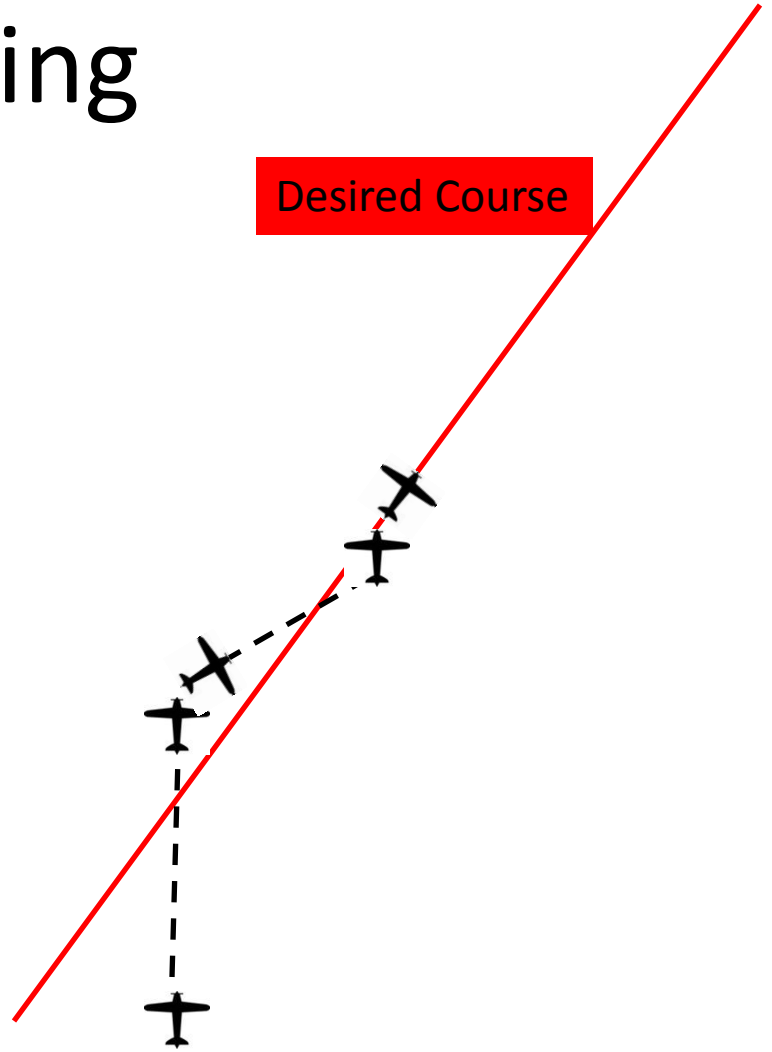
- For the Reading at the Right, a Good Initial Intercept Heading Might Be:
  - A. 320
  - B. 300
  - C. 303

Intercept and Track (cont.)

- After Making an Initial Intercept, if the CDI Needle Remains Steady – This Means There is a Wind and You Are Just Paralleling the Course
- Increase Again By Another 10 Degrees

Tracking

- Successive Trial and Error Approach
- Continue to Reduce Intercept Angles
- Minimize CDI Offsets



On Course – Heading Home

- VOR
- Mainstay of Electronic Navigation Systems
- Rapidly Being Replaced By GPS