



**Practical VOR Interpretation  
or  
Give Your VOR Some Positional Awareness**

# Pilot's Problems With VOR

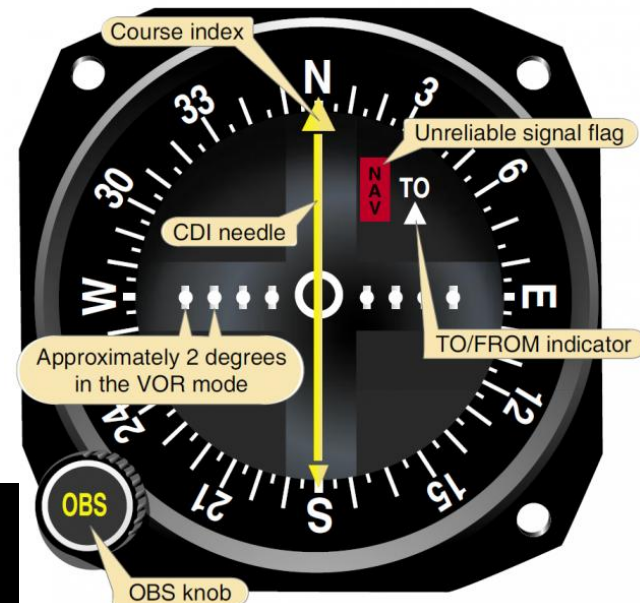
- Misinterpretation, or
- Pilot's Perceptions Don't Match Reality, or
- Overreliance on GPS (Rust and Corrosion Has Set Into Your CPU)
- Common VOR Errors:
  - Trying to Use Aircraft Heading Too Soon
  - Confusion Between Radial and Bearing
  - Where is my Airplane Relative to VOR or Desired Course
  - Overall Loss of Positional Awareness
  - Inefficient Turning Direction (Fly Away From Course)

**The Following is an Adaptation of VOR Interpretation as Taught to USAF  
Aircrews in the Early 1960s by Moi!**

# Must Know!

- Flying **To** a VOR
  - Bearing = Radial + 180 Degrees
- Flying **From** a VOR
  - Bearing = Radial
- The Bearing (Course) is Set By the Omni Bearing Selector (OBS) Knob

**Here the Course is 360 Degrees and We Are On the \_\_\_\_\_ Degree Radial**



# Some Explanation for the Purists

**I'll use the terms 'Bearing' and 'Course' to mean the same thing.**

**In practical application, since a VOR gives us a 'Course' referenced to magnetic North, all VOR 'Courses' are also 'Bearings' and vice versa.**

**Just recognize they are both referenced to magnetic North.**

# TMI – Please Sir, Can I Use GPS Instead?

- Assume Instructor or ATC Says; “Intercept and Track Outbound on 150 Degree Radial of CWK”
  - You Know Enough to Set 150 Degrees and ID the VOR
  - You Get This Reading – Then What?





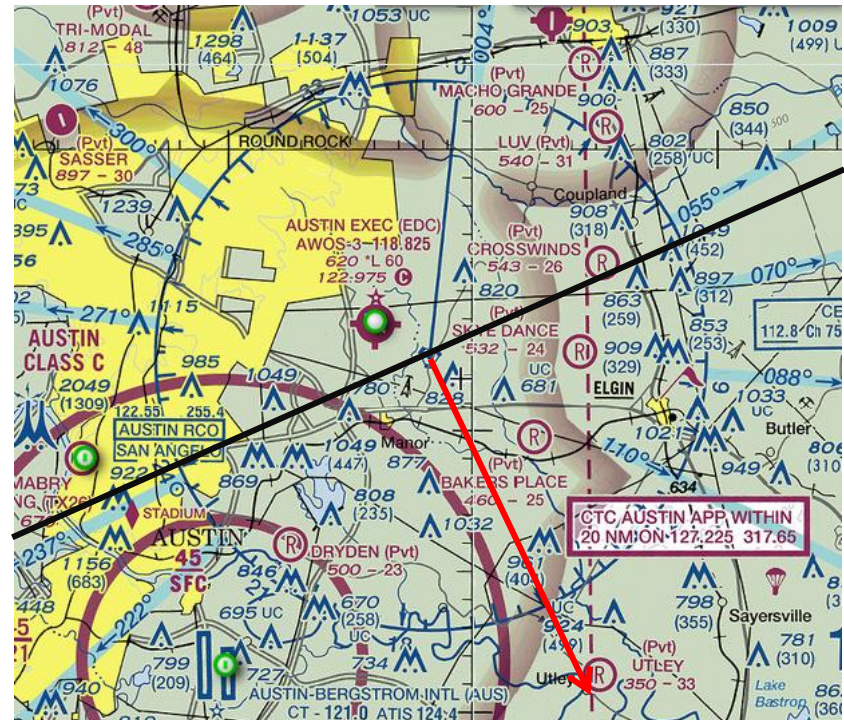
# Visualize Your Position

- Step 1, Mentally Draw a Line Perpendicular to Radial or Bearing Through the VOR
  - Radial (red line)

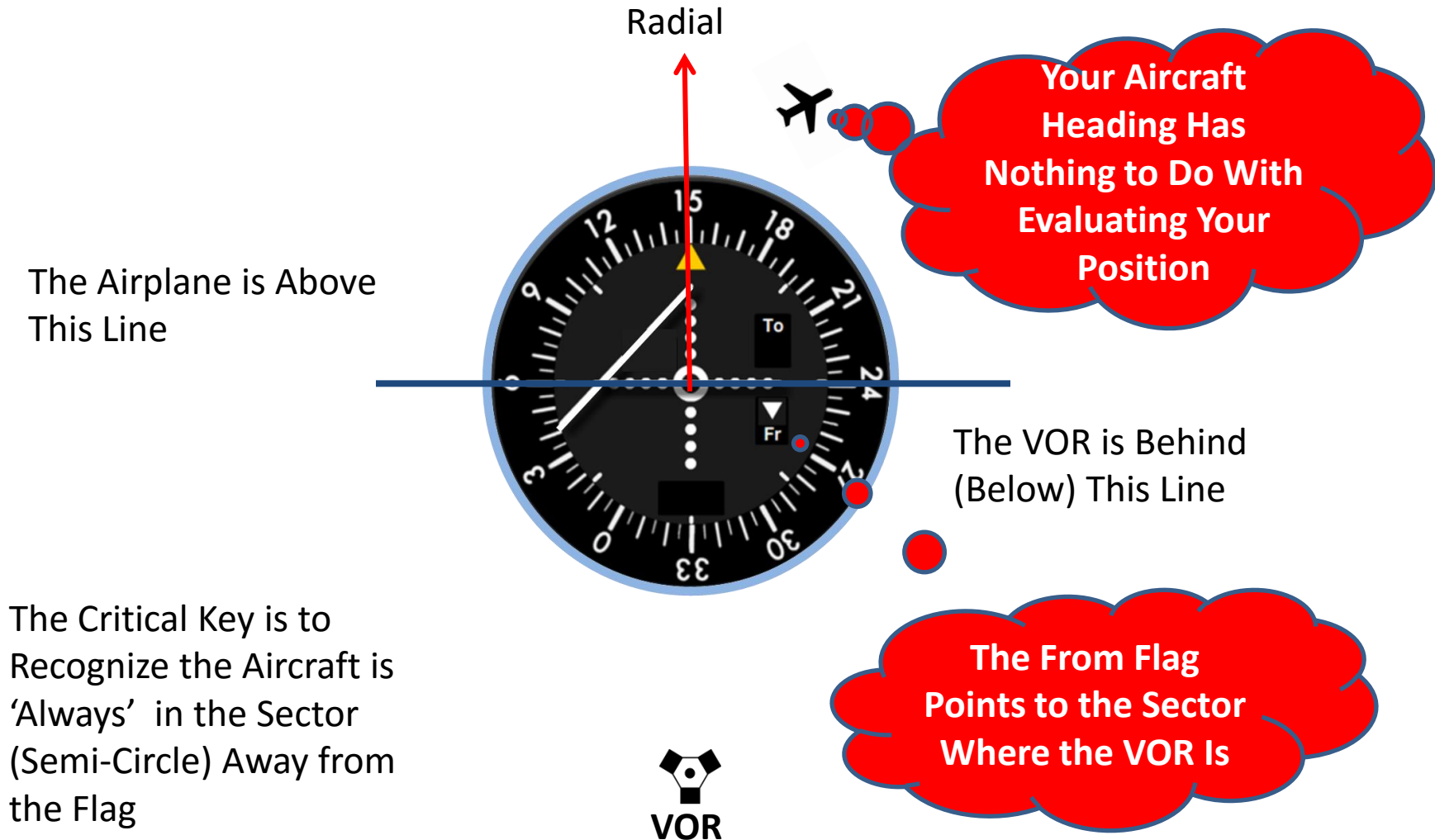
In This Example We have Shown on a Sectional the 150 Degree Radial (Red Line) and the Perpendicular thru the VOR (Black Line).

Recognize we have to be somewhere south of the black line.

**But There is an Easier Way to Do This. (See Next Page)**

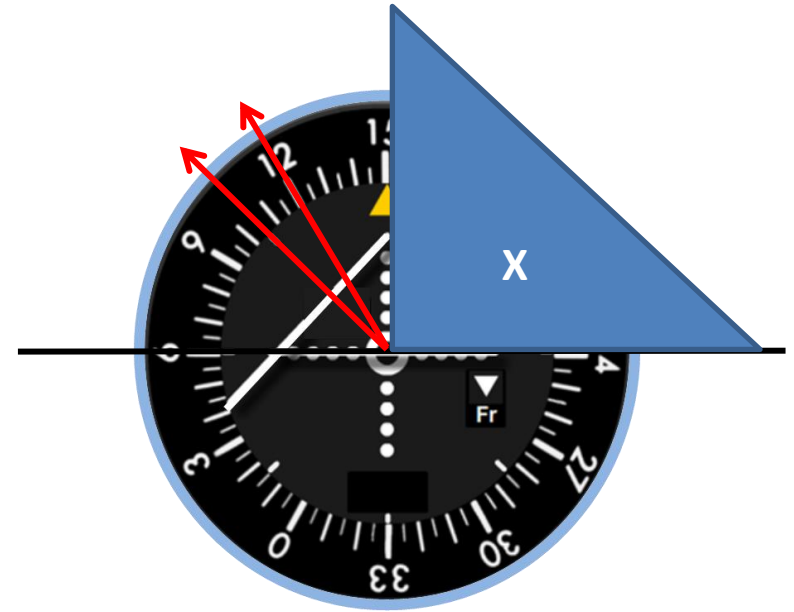


# Evaluate Your Position (cont.)



# Determine Intercept

- Step 2, **Airplane Cannot Be Within Any Sector That Contains CDI or the VOR**
- Recognize Airplane Is Within the Blue Area – Acft Heading Doesn't Matter Yet...
- Step 3, Select Either a 30 or 45 Degree Intercept Course in CDI Sector





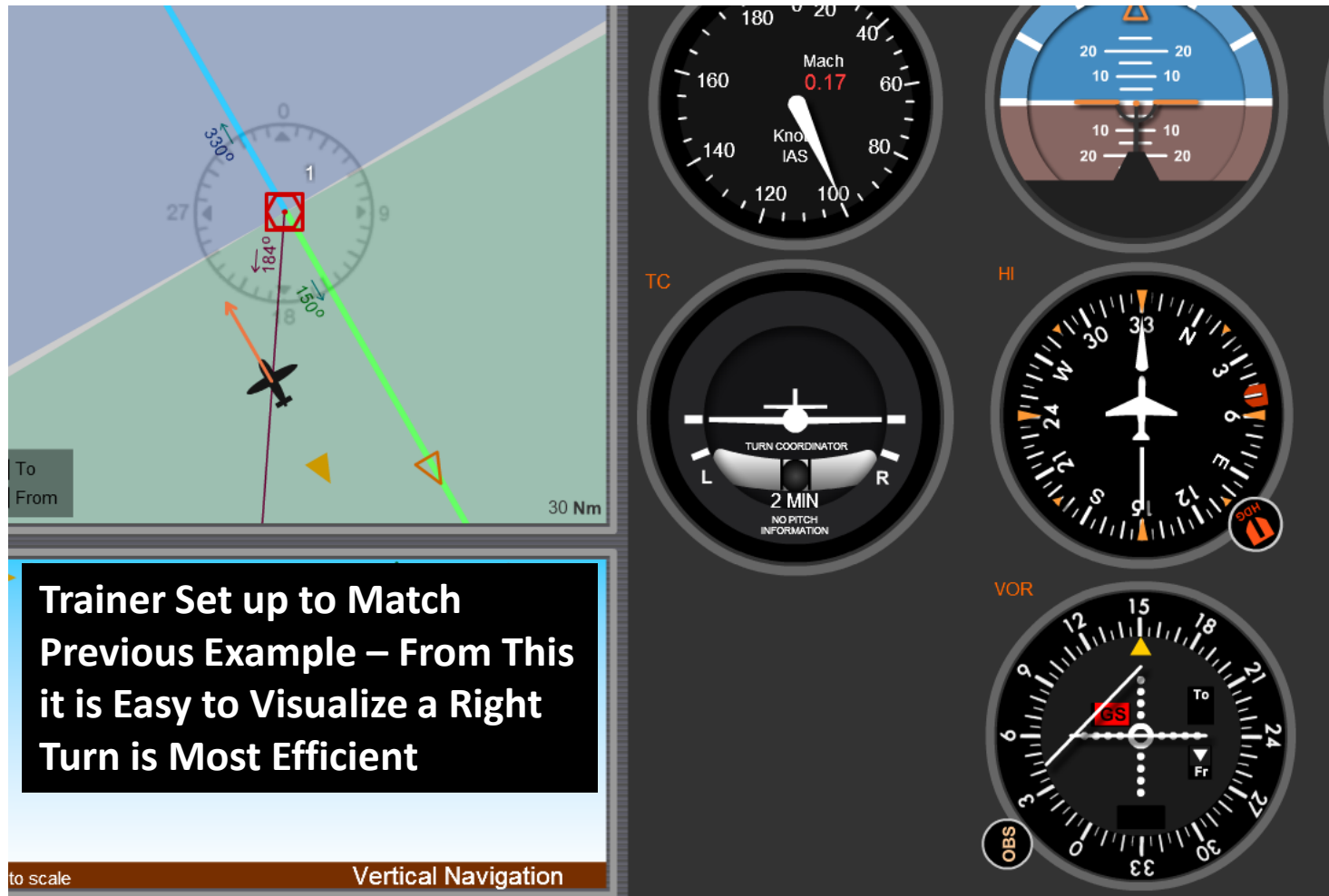
# Turn to Intercept Course

- Step 4, Visualize Aircraft Heading in Blue Area, then
  - Turn Most Direct Way to Intercept Course – Always Make the Turn ‘Towards’ the CDI
  - Turn, For This Example, is Right
  - Most Efficient Turn is Less Than 180 degrees



# VOR Trainer

- <http://www.luizmonteiro.com/Index.aspx>



# Example Problem

## (Track Inbound On 190 Deg Radial)

- Where is VOR?
  - Up or Down
- What Quadrant Is Airplane In?
  - A, B, C, or D
- 45 Degree Intercept Heading? \_\_\_\_\_
- What Direction to Turn?
  - Left or Right

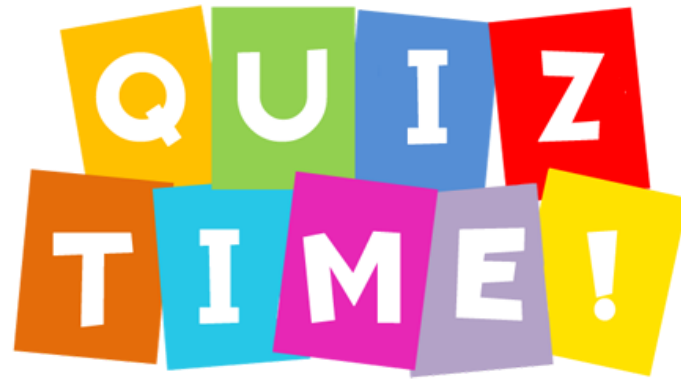


# What Have We Done?

- Basically Used Classical VOR Indicator As HSI
  - Recognized Position
  - ID Intercept Angle (30/45) and Intercept Course (040 or 055)
  - Superimposed Aircraft Heading on VOR
  - Turned Efficiently

HSI Using Previous Example





# QUIZ TIME!

- You must know aircraft heading to visualize position relative to VOR? T/F
- Flying to a VOR you are always flying a bearing? T/F
- Flying away from a VOR the bearing is the same as the radial? T/F
- Selection of an intercept angle (course) is arbitrary? T/F
- If you make a turn more than 180 degrees to intercept a course you have turned efficiently? T/F
- To select an intercept course you must incorporate aircraft heading? T/F



# Conclusion and Suggestions

- HSI has Resolved Many VOR and ILS Interpretation Problems, But Not All Aircraft Have an HSI
- GPS Systems Do Fail (I've Had 3 in last 24 months)
- VOR is Valid Means to Navigate
- Back Up Your GPS With VOR, or better yet
- Practice a X-Country with VOR Alone

**Soon You Will Become a VOR Expert!**