

SESSION 66: RNAV (GPS) APPROACHES — RF LEGS, FLY-BY WAYPOINTS, AND ANNUNCIATIONS

1. An "RF leg" (radius-to-fix) on an RNP approach is:
 - A. A straight track between two fixes
 - B. A holding pattern
 - C. A direct-to course
 - D. A constant-radius curved flight path between two defined fixes

2. Flying an RF leg, the navigator and autopilot/flight director:
 - A. Require the pilot to time the arc manually
 - B. Use a DME arc technique
 - C. Track the defined curved path precisely while the pilot monitors
 - D. Fly a straight line through the fixes

3. An RF leg requires the aircraft and navigator to be:
 - A. Above FL180
 - B. Equipped with DME
 - C. Authorized/capable for RF legs (an RNP capability with the required equipment)
 - D. In VMC

4. Because manual tracking of an RF leg is impractical, the recommended technique is to:

- A. Use the autopilot or flight director coupled to the RNP guidance while monitoring the path
- B. Hand-fly using timing
- C. Use a VOR radial
- D. Disconnect the automation and estimate the arc

5. During an RF leg, the pilot monitors the:

- A. Marker beacons
- B. Magnetic compass only
- C. Glideslope
- D. Cross-track error and the moving map to ensure the aircraft tracks the curved path

6. A "fly-by" waypoint within the approach is one where the navigator:

- A. Begins the turn before the waypoint to smoothly join the next leg
- B. Overflies the waypoint before turning
- C. Enters a hold
- D. Reverses course

7. A "fly-over" waypoint within the approach (often the missed approach point or holding fix) is one where the aircraft:

- A. Turns before the waypoint
- B. Crosses/overflies the waypoint before turning
- C. Begins a descent
- D. Holds automatically

8. The pilot anticipates turn behavior at approach waypoints by:

- A. Disregarding the symbology
- B. Watching only the airspeed
- C. Recognizing fly-by (turn early) versus fly-over (overfly then turn) from the chart
- D. Using the glideslope

9. The navigator annunciates the active mode/segment through the approach. The pilot must confirm these annunciations to:

- A. Replace the chart
- B. Verify the correct segment, sensitivity, and guidance are active as expected
- C. Set the cruise altitude
- D. Determine the alternate

10. If the navigator does not announce the expected approach mode before the FAF, the pilot should:

- A. Continue to the published minimums anyway
- B. Increase sensitivity manually
- C. Disconnect the autopilot and continue visually
- D. Not descend on the approach minimums and consider a missed approach or alternate plan

11. During the missed approach, the navigator typically requires the pilot to:

- A. Reverse the inbound course manually
- B. Disregard the annunciations
- C. Tune a VOR
- D. Activate the missed approach (e.g., a "SUSP/unsuspend" or "activate missed") so it sequences the missed approach legs

12. At the missed approach point, if the navigator suspends sequencing, the pilot must:

- A. Continue inbound
- B. Hold automatically
- C. Unsuspend/activate the missed approach so the navigator sequences the published missed approach
- D. Reverse course manually

13. An RF leg in the missed approach segment is flown:

- A. By timing
- B. The same way as an RF leg on the approach — coupled to the RNP guidance while monitoring
- C. By a VOR radial
- D. By a procedure turn

14. The autopilot/flight director should be used on an RF leg because:

- A. It is required by ATC
- B. Precise tracking of the constant-radius path is difficult to achieve by hand
- C. It eliminates the need for a database
- D. It increases the bank limit

15. The pilot must monitor the autopilot during a coupled RF leg to:

- A. Set the transponder
- B. Compute fuel
- C. Ensure it is tracking the path and to intervene if it does not
- D. Tune the navaid

16. A "fly-by" waypoint with a sharp turn on the approach will have:

- A. A greater lead distance for the turn anticipation
- B. No turn anticipation
- C. A fly-over behavior
- D. The aircraft stop at the waypoint

17. The annunciation confirming the approach guidance is active (vs. armed) tells the pilot the navigator has:

- A. Lost RAIM
- B. Transitioned to the final approach sensitivity and guidance
- C. Reverted to en route
- D. Increased to ± 5 NM

18. If an RF leg cannot be flown (e.g., loss of RNP capability or an annunciated failure), the pilot should:

- A. Continue the RF leg manually
- B. Increase sensitivity
- C. Time the arc
- D. Execute the missed approach or use an approach not requiring RF, as appropriate

19. The accuracy of the RF leg and the approach path depends on:

- A. The transponder
- B. A current, valid navigation database and a properly functioning RNP system
- C. The magnetic compass
- D. The DME pairing

20. A pilot briefing an RNP approach with RF legs should note:

- A. Only the missed approach
- B. Only the frequencies
- C. The RF segments, the required equipment/authorization, and the autopilot/monitoring plan
- D. Only the cruise altitude

21. Monitoring annunciations through the approach segments allows the pilot to:

- A. Detect a failure to sequence, a downgrade, or an unexpected mode and respond before it affects safety
- B. Replace the cross-check
- C. Eliminate the missed approach
- D. Lower the minimums

22. A fly-over waypoint at the missed approach point means the aircraft will:

- A. Cross the MAP before beginning the missed approach turn
- B. Turn before the MAP
- C. Hold at the FAF
- D. Reverse course at the FAF

23. When the autopilot is coupled on the approach, the pilot remains responsible for:

- A. Nothing once coupled
- B. Only the radios
- C. Only the landing
- D. Monitoring the flight path, modes, and annunciations and being ready to take over

24. The fundamental reason RF legs and advanced RNAV path segments require monitoring is that:

- A. The automation flies a precise path the pilot must verify is correct and engaged
- B. They replace the chart
- C. They eliminate the database requirement
- D. They are flown by timing

25. The fundamental principle of flying RF legs and monitoring annunciations is that the pilot must:

- A. Disconnect the automation on the curved segments
- B. Use the appropriate automation to fly the RNP path precisely while actively monitoring the annunciations, sequencing, and guidance, intervening if anything is not as expected
- C. Time the RF legs manually
- D. Disregard the annunciations once the approach is loaded

ANSWER KEY & EXPLANATIONS – SESSION 66

1. D. Constant-radius curved path — An RF leg is a constant-radius curved flight path between two defined fixes.
2. C. Track precisely/monitor — Flying an RF leg, the navigator and autopilot/flight director track the defined curved path precisely while the pilot monitors.
3. C. RF-capable/authorized — An RF leg requires the aircraft and navigator to be authorized/capable for RF legs (an RNP capability with the required equipment).
4. A. Couple + monitor — Since manual tracking is impractical, the recommended technique is to use the autopilot or flight director coupled to the RNP guidance while monitoring the path.
5. D. Cross-track/map — During an RF leg, the pilot monitors the cross-track error and the moving map to ensure the aircraft tracks the curved path.

6. A. Turn before — A fly-by waypoint is one where the navigator begins the turn before the waypoint to smoothly join the next leg.

7. B. Overfly then turn — A fly-over waypoint is one where the aircraft crosses/overflies the waypoint before turning.

8. C. Recognize symbology — The pilot anticipates turn behavior by recognizing fly-by (turn early) versus fly-over (overfly then turn) from the chart.

9. B. Verify segment/guidance — Confirming the annunciations verifies the correct segment, sensitivity, and guidance are active as expected.

10. D. Don't descend/miss — If the expected approach mode is not annunciated before the FAF, the pilot does not descend on the approach minimums and considers a missed approach or alternate plan.

11. D. Activate missed — During the missed approach, the navigator typically requires the pilot to activate the missed approach so it sequences the missed approach legs.

12. C. Unsuspend/activate — If the navigator suspends sequencing at the MAP, the pilot unsuspends/activates the missed approach so the navigator sequences the published missed approach.

13. B. Same as approach RF — An RF leg in the missed approach segment is flown the same way as on the approach — coupled to the RNP guidance while monitoring.

14. B. Hard to hand-fly — The autopilot/flight director should be used on an RF leg because precise tracking of the constant-radius path is difficult by hand.

15. C. Ensure tracking/intervene — The pilot monitors the autopilot during a coupled RF leg to ensure it is tracking the path and to intervene if it does not.

16. A. Greater lead distance — A fly-by waypoint with a sharp turn has a greater lead distance for the turn anticipation.

17. B. Final guidance active — The "active" (vs. armed) annunciation tells the pilot the navigator has transitioned to the final approach sensitivity and guidance.

18. D. Miss/non-RF approach — If an RF leg cannot be flown, the pilot executes the missed approach or uses an approach not requiring RF, as appropriate.

19. B. Current database/system — The accuracy of the RF leg and approach path depends on a current, valid navigation database and a properly functioning RNP system.

20. C. RF/equipment/automation plan — Briefing an RNP approach with RF legs includes the RF segments, the required equipment/authorization, and the autopilot/monitoring plan.

21. A. Detect failure/downgrade — Monitoring annunciations lets the pilot detect a failure to sequence, a downgrade, or an unexpected mode and respond before it affects safety.

22. A. Cross MAP first — A fly-over waypoint at the MAP means the aircraft crosses the MAP before beginning the missed approach turn.

23. D. Monitor/ready to take over — With the autopilot coupled, the pilot remains responsible for monitoring the flight path, modes, and annunciations and being ready to take over.

24. A. Verify precise path — RF legs and advanced RNAV segments require monitoring because the automation flies a precise path the pilot must verify is correct and engaged.

25. B. Automate + monitor/intervene — The fundamental principle is to use the appropriate automation to fly the RNP path precisely while actively monitoring the annunciations, sequencing, and guidance, intervening if anything is not as expected.