SESSION 37: HOLDING PROCEDURES — TIMING, DME, WIND CORRECTION, AND EFC

1. In a timed holding pattern at or below 14,000 feet, the pilot times the inbound leg to be:

A. 1 minute

B. 2 minutes

C. 30 seconds

D. 1½ minutes

2. Timing of the inbound leg begins when the aircraft is:

A. Established on the outbound leg

B. Abeam the holding fix or wings level outbound, whichever occurs later

C. Crossing the fix inbound

D. At the midpoint of the outbound leg

3. If the first inbound leg is timed at 1 minute 15 seconds (too long, indicating a tailwind outbound), the pilot should:

A. Lengthen the outbound leg on the next circuit

B. Increase airspeed

C. Maintain the same outbound time

D. Shorten the outbound leg on the next circuit

4. If the inbound leg times at 45 seconds (too short, indicating a headwind outbound), the pilot should:

A. Shorten the outbound leg

B. Lengthen the outbound leg on the next circuit

C. Increase the bank in the turns

D. Reduce airspeed

5. The goal of adjusting the outbound leg timing is to:

A. Increase the holding airspeed

B. Make the inbound leg the standard time (1 minute at/below 14,000)

C. Keep both legs exactly equal

D. Minimize fuel burn only

6. In a DME or RNAV hold, the legs are defined by distance, so the pilot:

A. Times the inbound leg as usual

B. Times the outbound leg only

C. Flies to the specified DME/distance value at each end rather than timing

D. Uses a 360-degree orbit

7. Wind correction in a holding pattern is applied so that the aircraft:

A. Flies the same heading on both legs

B. Tracks the inbound course accurately and remains within protected airspace despite wind drift

C. Ignores the wind on the outbound leg

D. Increases the inbound leg time

8. The "triple the inbound correction" technique for the outbound leg means:

A. The outbound wind correction angle is roughly three times the inbound drift correction to offset the lesser time/turn effects

B. The outbound leg is flown three times

C. The airspeed is tripled outbound

D. The bank angle is tripled

9. If the inbound leg requires a 5-degree right crab to hold the course, the outbound leg correction would be approximately:

A. 5 degrees right

B. 5 degrees left

C. 15 degrees in the opposite direction (left of the outbound heading)

D. No correction

10. The outbound wind correction is applied in the opposite direction to the inbound correction because:

A. The wind reverses in the pattern

B. The aircraft is flying the reciprocal heading outbound, so the crab is mirrored

C. The protected airspace requires it

D. The DME requires it

11. An "Expect Further Clearance" (EFC) time is issued by ATC to:

A. Indicate the required fuel

B. Set the inbound leg timing

C. Provide a time at which to expect onward clearance, and to use if communications are lost

D. Assign the transponder code

12. If a pilot holding with an EFC time loses two-way communication, they should:

A. Hold indefinitely until contact is restored

B. Leave the holding fix immediately

C. Leave the holding fix at the EFC time and proceed per the lost-comm procedures

D. Squawk 1200

13. A pilot holding should plan fuel so that:

A. Sufficient reserves remain to reach the destination or alternate after the expected hold, plus required reserves

B. The tanks run to empty during the hold

C. Only the inbound legs consume fuel

D. The hold is flown at maximum airspeed

14. When ATC issues a hold without an EFC time, the pilot should:

A. Assume the hold is indefinite and not request anything

B. Leave the hold whenever desired

C. Squawk 7600

D. Request an EFC time from ATC

15. A pilot approaching a holding fix should begin slowing to holding speed:

A. After the first circuit

B. Only when ATC instructs

C. After completing the entry

D. Within about 3 minutes of reaching the fix

16. Bank angle in holding pattern turns should be the lesser of 30 degrees or:

A. The maximum the aircraft can sustain

B. 45 degrees

C. The bank provided by a flight director or 3 degrees per second (standard rate)

D. 15 degrees in all cases

17. A pilot timing the inbound leg uses a stopwatch or the clock's sweep-second function, which is:

A. A required IFR instrument under §91.205(d)

B. Optional for holding

C. Only needed above 14,000 feet

D. Replaced by the DME in all cases

18. If a strong crosswind exists in the holding pattern, the primary effect on the timing legs is:

A. The inbound and outbound legs are unaffected

B. Only the inbound leg lengthens

C. The pattern may drift, and the pilot must apply drift correction and may need to adjust timing

D. The turns become impossible

19. A holding pattern flown using GPS/RNAV "hold-in-lieu-of-procedure-turn" (HILPT) is:

A. Always a non-standard pattern

B. Timed only on the outbound leg

C. Flown at 265 KIAS regardless of altitude

D. A course-reversal hold the GPS can automatically depict and sequence

20. Managing fuel during an extended hold requires the pilot to:

A. Ignore fuel until the EFC time

B. Monitor fuel against the EFC time and divert decision point, requesting a new EFC or diverting before reserves are compromised

C. Fly faster to save time

D. Descend to a lower altitude only

21. The inbound leg timing standard exists because:

A. It produces a consistent, protected racetrack pattern of known dimensions

B. It minimizes the bank angle

C. It eliminates wind correction

D. It is required only for DME holds

22. A pilot who consistently rolls out left of the inbound course after the inbound turn should:

A. Increase airspeed

B. Lengthen the inbound leg

C. Reduce the bank angle

D. Adjust the outbound heading/turn to roll out on course, applying appropriate wind correction

23. When a hold is based on a DME fix with "10-mile legs," the pilot turns outbound at the fix and reverses inbound when reaching:

A. The DME distance that yields a 10-mile leg length

B. A 1-minute outbound time

C. The MHA

D. The EFC time

24. The relationship between EFC time and holding fuel planning is that the pilot:

A. Need not consider fuel if an EFC is issued

B. Uses the EFC time to estimate the expected hold duration and verify fuel adequacy, planning a divert decision accordingly

C. Burns fuel only on the inbound legs

D. Holds until fuel is exhausted

25. The fundamental purpose of holding timing, wind correction, and EFC management is to:

A. Fly a precise, protected pattern while managing fuel and the onward clearance safely

B. Increase the aircraft's airspeed

C. Eliminate the need for ATC clearances

D. Replace the navigation equipment

ANSWER KEY & EXPLANATIONS — SESSION 37

1. A. 1 minute — At or below 14,000 feet, the inbound leg is timed to be 1 minute.

2. B. Abeam/wings level outbound — Inbound timing begins abeam the fix or wings level outbound, whichever occurs later.

3. D. Shorten outbound — An inbound leg of 1:15 (tailwind outbound) means shortening the outbound leg on the next circuit.

4. B. Lengthen outbound — An inbound leg of 45 seconds (headwind outbound) means lengthening the outbound leg.

5. B. Standard inbound time — The goal of adjusting outbound timing is to make the inbound leg the standard time (1 minute at/below 14,000).

6. C. Fly to DME value — In a DME/RNAV hold, the pilot flies to the specified distance value at each end rather than timing.

7. B. Track course/stay protected — Wind correction is applied so the aircraft tracks the inbound course accurately and stays within protected airspace.

8. A. ~3× inbound correction — The triple-the-inbound technique sets the outbound wind correction angle to roughly three times the inbound drift correction.

9. C. ~15° opposite — A 5-degree right inbound crab yields about 15 degrees of correction in the opposite direction on the outbound leg.

10. B. Reciprocal/mirrored — The outbound correction is opposite because the aircraft flies the reciprocal heading outbound, mirroring the crab.

11. C. Expect onward/lost-comm — An EFC time provides when to expect onward clearance and is used if communications are lost.

12. C. Leave at EFC — A pilot holding with an EFC who loses comms leaves the fix at the EFC time and proceeds per lost-comm procedures.

13. A. Reserves remain — Holding fuel is planned so sufficient reserves remain to reach the destination or alternate after the hold, plus required reserves.

14. D. Request EFC — If a hold is issued without an EFC time, the pilot should request one from ATC.

15. D. Within ~3 minutes — The pilot begins slowing to holding speed within about 3 minutes of reaching the fix.

16. C. Flight director or standard rate — Holding turn bank should be the lesser of 30 degrees or the bank from a flight director / 3 degrees per second (standard rate).

17. A. Required IFR clock — The sweep-second clock is a required IFR instrument under §91.205(d), used for holding timing.

18. C. Drift/adjust timing — A strong crosswind may cause the pattern to drift, requiring drift correction and possibly timing adjustment.

19. D. HILPT GPS hold — A hold-in-lieu-of-procedure-turn is a course-reversal hold the GPS can automatically depict and sequence.

20. B. Monitor/divert — Managing fuel in an extended hold requires monitoring against the EFC and divert point, requesting a new EFC or diverting before reserves are compromised.

21. A. Consistent protected pattern — The inbound timing standard produces a consistent, protected racetrack pattern of known dimensions.

22. D. Adjust outbound/wind — Rolling out left of course after the inbound turn calls for adjusting the outbound heading/turn to roll out on course with appropriate wind correction.

23. A. DME for 10-mile leg — A "10-mile legs" DME hold reverses inbound at the DME distance yielding a 10-mile leg length.

24. B. Estimate hold/verify fuel — The EFC time is used to estimate the expected hold duration and verify fuel adequacy, planning a divert decision accordingly.

25. A. Precise pattern/manage fuel — The purpose of timing, wind correction, and EFC management is to fly a precise, protected pattern while managing fuel and the onward clearance safely.