

GBR Flight Maneuvers



Name: _____

GBR Flight Maneuvers

Steep Turn (AFH 9-2)

A 360 degree turn performed at a bank angle of 45° (50° if commercial student) where the maximum turning performance is attained and relatively high load factors are imposed.

Purpose: Develop flight control smoothness, coordination, orientation to outside references, and division of attention between flight control application.

CLEAR THE AREA

ENTRY

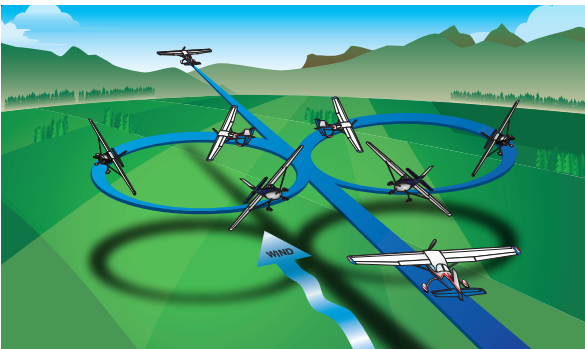
1. Identify a start/end horizon reference point & note heading
2. Level, controls configured, and airspeed at or below V_a
3. Bank by smoothly rolling to a 45° bank angle
4. When rolling through 30° bank, add ~ 100 rpm to maintain airspeed and increase back pressure
5. Scan: Horizon - Altimeter - Attitude Indicator - Look into the Turn
6. Rollout: ALT ± 100 ft, A/S ± 10 KTS, Bank $\pm 5^\circ$, HDG $\pm 10^\circ$

RECOVERY

1. Rollout on heading and reference point
2. Release back pressure
3. Reduce Power

COMMON ERRORS

1. Improper pitch, bank, or power combination for entry/rollout
2. Uncoordinated use of flight controls
3. Improper procedure in correcting altitude deviations
4. Loss of orientation
5. Failure to maintain 45° of bank



GBR Flight Maneuvers

Slow Flight (AFH 4-3)

Slow flight is when the airplane's Angle of Attack (AoA) is just below the critical AoA. If the critical AoA is reached, an aerodynamic buffet will occur.

Purpose: Develop understanding of the flight characteristics and how the flight controls feel near its aerodynamic buffet. Develop pilot recognition of how the airplane feels, sounds, and looks when a stall is impending.

CLEAR THE AREA

Pitch controls airspeed, Power controls altitude

ENTRY

1. Identify heading and altitude references
2. Level, controls configured, and airspeed at or below V_a
3. Maintain altitude and heading while placing aircraft in the **landing configuration** per aircraft checklist and:
4. Initial power reduction to reduce airspeed, pitch up to maintain altitude
5. Pitch nose up to target airspeed (5-10 KTS above V_{so})
6. Add power sufficient to maintain altitude

RECOVERY

1. Increase power
2. Slowly retract flaps to return aircraft to clean configuration
3. Maintain altitude and heading
4. Complete cruise checklist

COMMON ERRORS

1. Improper entry technique
2. Failure to establish and maintain specified airspeed
3. Improper correction for torque effect
4. Improper trim technique
5. Unintentional stall

GBR Flight Maneuvers

Power On Stall (Departure Stall) (AFH 4-9)

Simulating a stall in take off configuration.

Purpose: Develop stall awareness and recovery techniques.

CLEAR THE AREA (*Recovery must be completed above 1500' AGL*)

EXECUTION

1. Configure per takeoff checklist (Normal or Short-field)
2. Slow aircraft to near rotation speed while maintaining altitude
3. Pitch for V_y for Normal Takeoff or V_x or for Short-Field Takeoff
4. Apply no less than 65 percent power
5. Maintain heading and remain coordinated with proper rudder usage
6. Smoothly increase AoA to continuously decrease airspeed
7. At first indication of stall, announce “**Stall Imminent**”
8. As aircraft buffets and the nose drops, announce “**Stalling**”
9. Briskly push the yoke forward to reduce the AoA and break the stall
10. Full power
11. As lift is restored, smoothly adjust pitch attitude to V_y or V_x
12. Maintain HDG +/- 10° in straight flight
13. Climb to designated altitude and heading, complete cruise checklist
14. **If turning stall:** bank not to exceed 20° , +/- 10°

COMMON ERRORS

1. Failure to recognize first indications of a stall
2. Failure to achieve full stall
3. Delayed recovery
4. Uncoordinated use of flight controls



GBR Flight Maneuvers

Power Off Stall (Landing/Arrival Stall) (AFH 4-8)

Simulating a stall in the landing configuration.

Purpose: Develop stall awareness and recovery techniques.

CLEAR THE AREA (*Recovery must be completed above 1500' AGL*)

EXECUTION

1. Configure per landing checklist
2. Reduce power to idle
3. Establish 500 fpm descent at an airspeed to simulate final approach
4. Maintain heading and remain coordinated
5. Smoothly bring the nose of the aircraft to the horizon
6. Continue to smoothly increase AoA to induce a stall
7. At first indication of stall, announce “**Stall Imminent**”
8. As aircraft buffets and the nose drops, announce “**Stalling**”
9. Briskly push the yoke forward to reduce the AoA and break the stall
10. Full power, retract first notch of flaps
11. As lift is restored, smoothly adjust pitch attitude to V_x and climb
12. Begin to incrementally retract flaps to climb at V_y
13. Maintain HDG $\pm 10^\circ$ in straight flight
14. Climb to designated altitude and heading, complete cruise checklist

COMMON ERRORS

1. Failure to recognize first indications of a stall
2. Failure to achieve full stall
3. Delayed recovery
4. Uncoordinated use of flight controls



GBR Flight Maneuvers

Emergency Descent (AFH 9-2)

A maneuver for descending as rapidly as possible to a lower altitude or to the ground for an emergency landing.

Purpose: The need for an emergency descent may result from a fire, loss of cabin pressurization, sick passengers or any other situation demanding an immediate descent.

CLEAR THE AREA

EXECUTION

High Drag: (Smoke in the cockpit, medical emergency, etc)

1. Briskly reduce power to idle
2. Deploy full flaps
3. Bank by smoothly rolling to a 30° - 45° bank angle to maintain a positive load on the aircraft
4. Allow the nose down to descend at V_{fe} (top of the white arc)
5. Recover at an altitude determined by the instructor or examiner

Low Drag: (Engine Fire, etc)

1. Briskly reduce power to idle
2. Bank by smoothly rolling to a 30° - 45° bank angle to maintain a positive load on the aircraft
3. Allow the nose down to descend at V_{no}
4. Recover at an altitude determined by the instructor or examiner

COMMON ERRORS

1. Improper use of appropriate checklist
2. Improper clearing procedures before performing emergency descent
3. Failure to identify if an emergency descent is needed
4. Improper procedures to recover from an emergency descent

GBR Flight Maneuvers

Chandelle (Commercial) (AFH 9-5)

A maximum performance 180° climbing turn beginning from straight and level flight, and concluding with the airplane in a wings level, nose high attitude approximately 10 KTS above stalling speed.

Purpose: Gain the most altitude possible for a given bank angle and power setting. Develop coordination, orientation, planning and feel for the airplane at varying airspeeds and attitudes.

CLEAR THE AREA

ENTRY *There is no standard altitude gain*

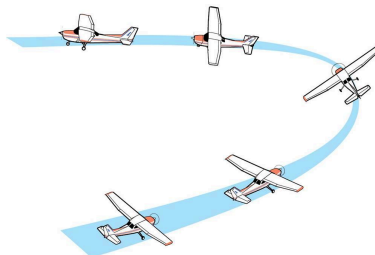
1. Identify ground references
2. Level, controls configured, and airspeed at V_a
3. Advance throttle to full power
4. **1st half of turn:** Roll to 30° of bank while smoothly increasing pitch attitude
 - **Constant bank, Increasing pitch**
5. **2nd half of turn:** Smoothly roll out while maintaining pitch attitude
 - **Decreasing bank, Constant pitch**
6. Rollout within +/-10° of HDG, with airspeed 5-10 KTS above V_{s1}
7. Maintain airspeed momentarily while just above stall

RECOVERY

1. Maintain altitude and power while slowly pitching down to increase airspeed. Return to cruise power

COMMON ERRORS

1. Improper pitch, bank, or power combination for entry/rollout
2. Improper planning and timing of pitch and bank attitude changes
3. A stall during the maneuver



GBR Flight Maneuvers

Lazy Eight (Commercial) (AFH 9-6)

Two 180° turns in opposite directions, while making a climb and descent in a symmetrical pattern during each of the turns.

Purpose: Develop coordination of the flight controls across a wide range of airspeeds and attitudes.

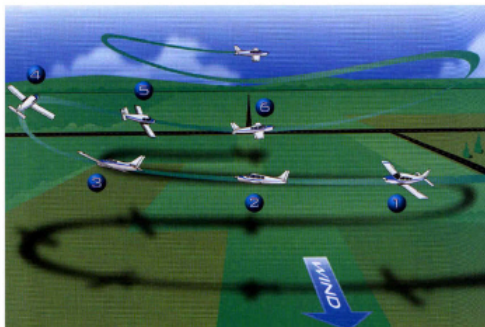
CLEAR THE AREA

ENTRY

1. Identify 45°, 90°, and 135° points
2. Establish level flight at V_a
3. Smoothly initiate climbing turn
4. At 45° reference point: maximum pitch with 15° of bank
5. At 90° reference point: level pitch with 30° of bank
6. At 135° reference point: maximum nose down attitude, 15° of bank
7. At 180 reference point: pitch and wings level within +/-100 ft of entry ALT, +/-10 KTS of entry airspeed, +/-10° of entry HDG
8. Repeat sequence in opposite direction

COMMON ERRORS

1. Poor selection of reference points
2. Uncoordinated use of flight controls
3. Inconsistent airspeed and altitude at key reference points
4. Excessive deviation from reference points, loss of orientation
5. Gain or loss of altitude at 180° point



GBR Flight Maneuvers

Eights on Pylons (Commercial) (AFH 6-14)

A figure eight ground track flown around “pylons.” The pilot adjusts the sight picture (climb & descend) to align the wing-tip reference with the pylon based on ground speed.

Purpose: Ground reference maneuver designed to fly a figure-8 pattern where pilot maintains reference point using pitch adjusting to changes in ground speed. Climb when ground speed is higher, descend when ground speed is lower

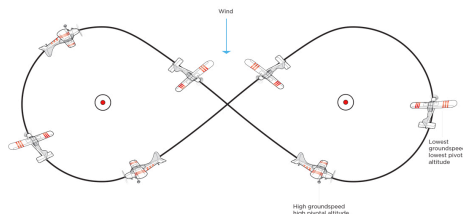
CLEAR THE AREA

ENTRY *Calculate pivotal altitude ($GS^2/11.3$)*

1. Locate a straight road, power lines, etc. that is perpendicular to surface winds
2. Identify pylon references
3. Establish entry airspeed with aircraft level at V_a at pivotal ALT
4. Enter downwind, crossing reference pylon at a 45° angle on your left
5. Lower wingtip to 30° on pylon and keep reference on the wingtip
6. Maintain reference:
 1. **lower pitch/descend** if pylon is **forward** of wingtip
 2. **raise pitch/climb** if pylon is **behind** wingtip
7. Locate 2nd pylon - as pilot crosses the road, count between 5-7 seconds, then lower the right wing to identify second pylon

COMMON ERRORS

1. Faulty entry procedure, poor planning or orientation



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2. Use of rudder alone to maintain pylon line of sight
3. Poor selection of pylons

Steep Spiral (Commercial) (AFH 9-4)

A continuous gliding turn during which a constant radius is maintained around an area on the ground. The radius should be such that the steepest bank angle should not exceed 60°.

Purpose: Rapidly dissipate substantial amounts of altitude while remaining over a selected spot.

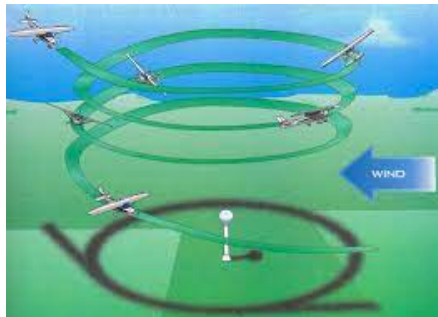
CLEAR THE AREA (*Must recover at or above 1500' AGL*)

ENTRY

1. Identify a ground reference point
2. Select altitude suitable for three 360° turns
3. Level, controls configured, and airspeed at or below V_a
4. Plan steep spiral into the wind and to the left
5. When over the start point, reduce power to idle and initiate spiral
6. Roll 50°- 55° bank (do not exceed 60° bank)
7. Clear the engine after completion of each 360° turn
8. After three 360° turns, rollout within +/- 10 HDG, A/S +/- 10 KTS

COMMON ERRORS

1. Improper pitch, bank, yaw or power for entry or rollout
2. Lack of constant airspeed and radius
3. Failure to remain oriented over the reference point
4. Failure to correct bank angle to compensate for the wind



GBR Flight Maneuvers

Accelerated Stall (Commercial) (AFH 4-10)

An accelerated stall demonstrates that the airplane can be stalled at any attitude and at any airspeed.

Purpose: Develop understanding that a stall can occur significantly above the POH stall speed. Experience stalls at speeds greater than +1G stall speed, and develop the ability to instinctively recover at the onset of such stalls.

CLEAR THE AREA (*Must be recover at or above 3000' AGL*)

ENTRY

1. Establish a HDG
2. Configure for cruise at or below V_a
3. Initiate a coordinated left turn to 45° bank
4. Immediately upon reaching 45°, briskly pull back on the yoke until stall warning horn and/or buffet *DO NOT ALLOW FULL STALL*
5. Briskly push forward on yoke to reduce AoA and break the stall
6. Level the wings and add power as necessary
7. Return to ALT and HDG
8. Complete cruise checklist

COMMON ERRORS

1. Failure to establish proper configuration proper to entry
2. Improper or inadequate demonstration of the recognition of and recovery from the accelerated stall

GBR Flight Maneuvers

Highlighting Differences in ACS/PTS Standards		
Maneuver	Private	Commercial
Steep Turns	45° BANK	50° BANK
	ALT±100 feet, A/S±10 Knots, BANK±5°, HDG ±10°	
Steep Spiral		Max 60° BANK
	A/S±10Knots, Rollout ±10° towards entry HDG	
Chandelle		HDG ±10°
8's on Pylons		BANK ≤40°
Lazy 8		At 180° Point : ALT ±100 ft, A/S±10 KTS, HDG±10°
Normal Take-off	A/S Vy +10/-5 KTS	ALT Vy ±5 KTS
Short-Field Take-off	A/S 63K+10/-5 KTS	A/S 63K ± 5 KTS
Soft-Field Take-off	A/S Vx/Vy +10/-5 KTS	A/S Vx/Vy ±5 KTS
Normal Landing	-0/+400 ft. of Target	-0/+200 ft. of Target
Short-Field Landing	200 ft. of Target	100 ft. of Target
Soft-Field Landing	POH A/S +10/-5	POH A/S ±5 KTS
Go-Around Climb	A/S Vx/Vy +10/-5 KTS	A/S Vx/Vy +10/-5 KTS
Power-Off 180		-0/+200 ft. of Target
Slow-Flight	ALT 100 ft. A/S +10/-0 KTS	Alt ±50 ft. A/S +5/-0 KTS
	HDG ±10°, BANK ±10°	HDG ±10°, BANK ±5°
Power-On Stalls	Straight Flight HDG ±10°	If Turning BANK 20°±10°
Power-Off Stalls	HDG ±10°/if BANK 20°±10°	HDG±10°/if BANK 20°±5°
Cross-Controlled		CFIA Demonstrate
Elevator Trim Stalls		CFIA Demonstrate
Secondary Stalls		CFIA Demonstrate
Accelerated Stalls		45° BANK
ALT = Altitude, A/S = Airspeed, HDG - Heading		