Steep Spirals

AIR ECHO ALPHA 51, LLC.

Objective: The objective of the steep spiral is to provide a flight maneuver for rapidly dissipating substantial amounts of altitude while remaining over a selected spot. This maneuver is especially effective for emergency descents or landings.

Common Errors

- ❑ Failure to adequately clear the area
- ❑ Improper pitch, bank & power coordination during entry & rollout
- ❑ Uncoordinated use of the flight controls
- ❑ Not correcting the bank angle to compensate for wind
- ❑ Improper procedure in correcting airspeed and radius deviations
- ❑ Ineffective use of trim
- ❑ Inadequate airspeed control
- ❑ Performing by reference to the flight instrument rather than visual references
- ❑ Not scanning for other traffic during the maneuver
- ❑ Not completing the turn on designated heading /reference
- ❑ Loss of orientation

Completion Standards

- ❑ Adheres to recommended safety precautions
- ❑ Selects proper altitude to complete the maneuver
- ❑ Maintains constant airspeed & radius around reference point
- ❑ Applies wind-drift correction to track a constant radius circle around selected reference point with bank not to exceed 60° at steepest point in turn
- ❑ Divide attention between airplane control, traffic avoidance, & ground track, while maintaining coordinated flight
- ❑ Maintains airspeed, ±10 kts, entry & exit heading, ±10°, and completes the maneuver no lower than 1,500' AGL
- ❑ Uses Checklists

PAVE & Preflight Discussion

20- Min

- ❑ The **Pilot** & Crew
  - I'M Safe Checklist & Delegate Duties
- ❑ The **Plane**
  - POH - Stall speeds, CG location, Weight, configuration (flaps) & bank angles airframe, airspeed, engine limitations
- ❑ The En**vironment**
  - Weather Briefing
  - The effects of environmental elements on aircraft performance related to stalls (turbulence, wind shear, and high-density altitude)
  - Effects of wind speed, direction, shear or gusts on ground tract
- ❑ **External** Pressures
  - Aerodynamics associated with steep turns
    - Loss of vertical component of lift
    - Increased load factor
    - Overbanking tendency
    - Left turning tendencies
  - Factors & situations that could lead to an inadvertent stall
  - Distractions, improper task management, loss of situational awareness, or disorientation.
  - Coordinated and uncoordinated flight
- ❑ Rate and radius of turn
  - Function of airspeed & angle of bank
- ❑ Load Factor & Stall speed
  - Load factor in 60° bank = 2 G's

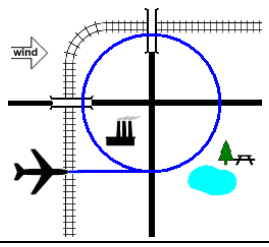
Bank	G's
0°	1
30°	1.155
45°	1.414
60°	2
70°	2.924
75°	3.864

  - The stall speed increases as the square root of the G's applied
- ❑ Inadvertent stalls while turning
  - Recovery - Reduce AOA before leveling wings
- ❑ Spin Awareness
  - Cause & Recovery.
- ❑ Engine operation
  - Operating the engine at idle for any prolonged period during the glide may result in excessive engine cooling, spark plug fouling, or carburetor ice.
  - Throttle should be periodically advanced to cruise power & sustained for a few seconds

Flight Maneuvers

20- Min

- ❑ Clear the Area
  - Altitude: sufficient to continue through a series of at least three 360° turns with task complete no lower than 1500 ft AGL
  - Airspeed: @ or below V_A
  - Airspace: E or G
  - Area Clear: No traffic
- ❑ The Set-up
  - Determine wind direction
    - Aircraft drift, lake ripples, smoke, dust
  - Select suitable reference point
    - The radius should be such that the steepest bank < 60°.
  - Determine Emergency landing spot
  - Enter & Exit on the downwind



- ❑ Steed Spiral
  - Reduce power to idle and establish a descent at V_{GLIDE} (maintain a constant airspeed throughout the maneuver)

** Airspeed tends to fluctuate as the bank angle is changed throughout the maneuver, anticipate with pitch corrections*

  - Prop- full forward
  - Gear – down & green (optional)
  - Established a gliding spiral with a constant radius around the selected reference point and complete three 360° turns.

**The steepest bank should not exceed 60°*

  - Correction for wind
  - Clear the engine each 360° of turn
  - Rollout - return to a wing's level glide with no change in airspeed
  - Recovery – return to cruise flight configuration

**Chop – V_{GLIDE}, Drop – Gear, Prop - Full*