



Open Aviation Solutions

Steep Turns – In-flight Notes

*CASA Recreational Pilot License (Aeroplane) – CASA Sample Syllabus
Lesson 18*

Language choices

"reduce bank first" – before raising the nose in a steep turn.

"wings level, then ease out" – the order that matters in a spiral dive.

"fly to the buffet, not through it" – for the max-rate and min-radius turns.

"keep it balanced" – the ball centred, especially near the stall.

Demonstration-Performance

For the sequence of each activity, choose whether you use:

- Demonstration-Performance: Explain, Demonstrate, Performance and Monitor, Evaluation
- DDM: Demonstrate, Direct, Monitor

or some other preference. Each in-flight activity just describes the sequence to be demonstrated and performed, regardless of the method you use.

Before starting the plane

- Confirm the **flight manual / POH** limits: manoeuvring limit load factors (symmetrical and rolling), V_{FE} , and whether **sideslipping is permitted** (and with flap?)
- Confirm a **lookout / clearing turn** before every manoeuvre, and recovery complete by **3000 ft AGL**
- Confirm today's **weight & balance**, take-off & landing performance, and fuel – assessed this flight (C2.1)

Record	Start	End
Tacho		
Maintenance		
Time		

After departing / established in the climb

- Assess the **climb** (cruise and best rate) and, on arrival, the **descent** — both revised/assessed today (A3.1, A3.3)
- Confirm **local area airspace**: geographical features and limits, airspace boundaries, the transit route and any transit lane, and the area height floor (A3.7)
- Brief the manoeuvres coming up: "We'll go up high and explore steep turns, then look at how one can go wrong — the sensations are dramatic the first time, and that's normal."

Pre-manoeuvre HASELL check

The same **HASELL** check from Lesson 5 (Stalling):

- **H – Height** – enough to complete and recover by 3000 ft AGL
- **A – Airframe** – correct configuration for the manoeuvre (take-off flap for the minimum-radius turn); no abnormal indications
- **S – Security** – harnesses tight, loose articles stowed
- **E – Engine** – Ts & Ps in the green; carb heat as required for the type
- **L – Location** – clear of controlled/restricted airspace, aerodromes and built-up areas
- **L – Lookout** – a clearing turn of at least 180°, preferably 360°; in a high-wing type, lift the wing before rolling in

Visibility is poor once banked steeply. Clear the airspace before you roll in, every time.

Steep level turn

Cruise configuration. Start at 45° bank; build to 60° as it firms up.

Sequence

- Lookout; note a reference point or heading to roll out on
- Roll into the bank; **add power progressively** as bank increases to hold speed
- Increase **back pressure** to hold the nose on the horizon; **balance** with rudder
- Hold with **BBB**: **bank** with aileron, **balance** with rudder, **back-pressure** with elevator
- If the nose drops:
 - **Reduce bank first**, then raise the nose, then re-establish the bank
- Recover: anticipate ~half the bank angle early, roll out, **reduce power** to cruise, **ease forward** to hold the nose

Maximum-rate turn

Cruise configuration, **full power**.

Sequence

- Lookout
- Roll into a steep bank and apply **full power**
- Increase back pressure until the **stall buffet** is felt
- **Relax** back pressure just enough to **stop the buffet** — hold it right at the threshold
- Note the high rate of turn
- Loss of control tendency: **release back pressure, reduce bank** with aileron
- Recover as for a steep level turn

Minimum-radius turn

Reduced power, **take-off flap** (do not exceed V_{FE}).

Sequence

- Lookout; check speed is below V_{FE} , select **take-off flap**
- Roll into a steep bank at a **reduced power** setting
- Slow to the **buffet** and hold it there — the slowest safe speed gives the smallest radius
- Note the tight radius
- Recover: as for a steep level turn; **retract flap** at a safe speed

Steep descending (gliding) turn

Sequence

- Lookout; ensure the area below is clear
- Select a speed **~10 kt above normal glide speed** for the type; throttle to idle/low power
- Establish a **steep nose-down attitude** to hold that speed at the steep bank
- If the speed builds too high: **reduce bank first**, then adjust attitude
- **Cross-check instruments** — steep nose-down attitude, high bank, high rate of descent
- Clear the engine every ~1000 ft on a prolonged glide
- Recover: reduce bank, raise the nose to the correct glide attitude/speed

Spiral dive – recognition and recovery

*Un-stalled and **fast** – the ASI is winding up. Wings level before you pull.*

Recognition

- Steep bank, nose low, **airspeed increasing**, high rate of descent, 'g' building
- Contrast with a spin (stalled, slow) – opposite pitch response

Recovery – in order

- **Power – close the throttle** (idle)
- **Roll the wings level** with coordinated aileron and rudder
- **Ease out of the dive** – smoothly raise the nose to the horizon (no snatch – mind the rolling-'g' limit)
- Under control: **cruise power**, resume normal flight

Straight sideslip

Only where the flight manual permits. Flaps retracted (unless the manual permits with flap). Practise at height first.

Sequence

- Lookout; pick a line feature into wind if available
- **Bank** with aileron toward the low wing; **opposite rudder** to hold the heading; **elevator** to hold speed
- More bank → more rudder; the **limit is full rudder**
- Note: high rate of descent, unbalanced ball, heading offset from track
- Recover: **level the wings** with aileron, **centre the yaw** with rudder, **hold glide speed** with elevator

Guard the airspeed throughout – especially in the recovery.

Slipping turn

Sequence

- Establish a glide on a (simulated) base leg; roll into a gliding turn
- Apply **opposite rudder** to slip; control **bank** with aileron and **speed** with elevator
- Turn until lined up on the selected path (minimum 90° heading change)
- Recover as from a gliding turn — allow **extra height**, the rate of descent is higher

Revision assessments (as time and flight permit)

Fold these in where they fit the flight — they are revised/assessed this lesson:

- **Forced landing (simulated)** — complete engine failure without prior indication: control, immediate actions, field selection, glide path, checks/Mayday, passenger brief, land (A6.3)
- **Radio failure** — carry out radio failure procedures and fault-finding on the inbound leg (C3.2)
- **Start/stop malfunctions and emergencies** — handled at start and shutdown (A1.1)

Return to aerodrome – flapless approach and landing

- Establish cruise; **descend** and route back within local airspace limits
- **Listen to AWIS/ATIS** – runway in use, circuit direction, QNH
- Revise the **flapless** approach and landing (A4.1): flatter approach, higher approach speed, longer float – plan the aiming point accordingly
- Instructor to take the approach and landing if workload or conditions require