Middle Georgia State University

PIPER ARCHER P28A MANEUVER GUIDE

VERSION 2024

Maneuver Guide Contents

Checklists and Briefings

Takeoff Briefing

Takeoffs are briefed so that the pilots have a clear understanding of the runway environment, emergency actions that may be required during the ground roll, initial takeoff and departure.

Procedure:

1. Determine which pilot will be PIC in case of emergency
2. Brief will be conducted (from memory) in the runup area prior to call for departure and crossing the hold short line. The Brief consists of five areas of concentration:
   - Runway Information
   - Engine Failure / Emergency During Ground Roll
   - Engine Failure with runway remaining
   - Engine Failure without runway remaining
   - Engine Failure above 1000' AGL

Briefing Script:

- "This will be a _____ takeoff from Runway ____ by the pilot in the _____ seat."
- "If we have an **ENGINE FAILURE or OTHER EMERGENCY DURING THE GROUND ROLL,** I will bring throttle to idle, apply brakes, and exit the runway if able."
- "If we have an **ENGINE FAILURE with runway remaining,** we will close throttle and land straight ahead."
- "If we have an **ENGINE FAILURE without runway remaining,** we will select a suitable landing spot to our front, or slightly to our side. If time permits, FUEL SELECTOR OFF, MIXTURE FULL LEAN, maintain positive control of aircraft and make an announcement to tower declaring an emergency"
- "If we have an **ENGINE FAILURE ABOVE 1,000' AGL**, turn back to the airport environment, and attempt landing on appropriate surface. Maintain control of the airplane and declare emergency to tower."

Pre-Maneuver Checklist

The Pre-Maneuver Checklist is performed before each training maneuver. This checklist serves as a baseline for aircraft prior to configuration for the maneuver.

Procedure:

LOCATE nearest field for landing in case of emergency.
GUMPS Check

1) Gas - Adequate
2) Undercarriage – N/A in an Archer
3) Mixture - FULL RICH
4) Prop - N/A in an Archer
5) Switches - Lights and Fuel Pumps ON

CLEARING Turns

(Coordinate with any traffic on Dispatch frequency (123.300) if they are within 3 to 4 miles.)

Ground Reference Maneuvers

Turns Around a Point (Private Only)

The objective of Turns Around a Point is to develop the pilot's skill in maintaining a specific relationship between the ground and the aircraft. It consists of two constant radius, coordinated, 360º turns.

Procedure:

1. Pre-Maneuver Checklist
2. Select altitude between **600'-1,000' AGL (recommend 1200' MSL)**, in non-congested area
3. Determine wind direction for downwind (tailwind) entry
4. Select outside visual reference (crossroads, tree, prominent landmark, *refrain from using buildings as reference point*), practice CFIT and wire strike avoidance
5. Enter at **cruise speed (100 to 115 kts)**, bug reference heading
6. Execute turns around the point, at least two 360º turns are required, unless otherwise directed by your instructor/evaluator.
7. Apply appropriate wind correction for each segment of turn
    a. *Highest* groundspeed = *steepest* bank
    b. *Slowest* groundspeed = most *shallow* bank
8. Exit maneuver on the entry heading

Airman Certification Standards:

- Altitude: +/- 100 feet
- Airspeed: +/- 10 Knots

Common Errors:

- Failure to clear the area
- Poor coordination
- Failure to maintain airspeed and altitude
- Failure to maintain constant radius around point

S-Turns Across a Road (Private Only)

The objective of S-turns Across a Road is track two equidistant, constant radii, half turns across a road, while maintaining coordinated flight, and applying proper wind-drift correction.

Procedure:

1. Pre-Maneuver Checklist
2. Select altitude between **600'-1,000' AGL (recommend 1200' MSL)**, in non-congested area
3. Determine wind direction for downwind (tailwind) entry
4. Select straight road or other reference (wires, treeline), perpendicular to the wind
5. Enter at **cruise speed (100 -115 kts)**, bug reference heading
6. Execute two 180º turns crossing the road perpendicular each time.
7. Apply appropriate wind correction for each segment of turn
    a. *Highest* groundspeed = *steepest* bank
    b. *Slowest* groundspeed = most *shallow* bank
8. Exit maneuver on entry heading

Airman Certification Standards:

- Altitude: +/- 100 feet
- Airspeed: +/- 10 Knots

Common Errors:

- Failure to clear the area
- Poor coordination
- Failure to maintain airspeed and altitude
- Failure to maintain constant radius across road

Rectangular Course

The objective of the Rectangular Course maneuver is to replicate wind correction in a traffic pattern. This maneuver is often done in an actual traffic pattern.

Procedure:

1. Pre-Maneuver Checklist
2. Select altitude between **600'-1,000' AGL (recommend 1200' MSL)**, in non-congested area
3. Determine wind direction for 45**º** downwind entry
4. Enter at **cruise speed (100 to 115 kts)**, bug reference heading
5. Crab into the wind on crosswind, and base legs of circuit
6. Exit maneuver on heading 45**º** opposite the downwind

Airman Certification Standards:

- Altitude: +/- 100 feet
- Airspeed: +/- 10 Knots

Common Errors:

- Failure to clear the area
- Poor coordination
- Failure to maintain airspeed and altitude
- Failure to maintain constant circuit around rectangular course due to improper wind correction

Eights-On Pylons (Commercial Only)

The objective of Eights-On Pylons is to develop intuitive control of the aircraft at a varying, low level altitude around two points on the ground. The main concept of this maneuver is to maintain the visual reference around the pylons, while maintaining pivotal altitude. Pivotal altitude varies throughout the maneuver as ground speed changes.

Procedure:

1. Pre-Maneuver Checklist
2. Determine pivotal altitude ($GS^2 \div 11.3$) + ground elevation.
3. Select two outside visual reference points (pylons) approximately half a mile, to a mile apart, ensure these pylons are perpendicular to the wind
4. Select outside visual reference point for entry heading, bug this heading
5. Enter at **cruise speed (100 to 115 kts)**, on a 45º to the downwind between the two pylons
6. Once abeam the pylon, begin turn
7. Make necessary altitude adjustments to maintain pivotal altitude
8. Briefly level wings when aircraft is between the two pylons
9. Once aircraft is abeam second pylon, begin turn
10. Make necessary altitude adjustments to maintain pivotal altitude
11. Exit on entry heading

Airman Certification Standards:

- Bank Angle: Not to exceed 40º AOB

Common Errors:

- Failure to clear the area
- Poor selection of visual reference points
- Failure to maintain adequate altitude control during the maneuver
- Failure to properly assess wind direction
- Poor coordination
- Failure to manipulate the controls in a smooth and continuous manner
- Failure to maintain orientation as the maneuver progresses

Performance Maneuvers

Steep Turns

The objective of a Steep Turn is to develop a pilot's skill in flight control coordination and smoothness, awareness of outside reference points, and constant need to scan for hazards.

Procedure:

1. Pre-Maneuver Checklist
2. Select altitude for task to be completed no lower than **1,500 feet AGL**
3. Select outside visual reference, bug reference heading
4. Enter at **cruise speed, (100 to 115 kts)**
5. Establish a single 360º turn with a **45º** bank angle (**50º for Commerical Standards)**
6. Roll out smoothly on original heading
7. For Commercial standards, execute **TWO continuous** 360º turns, one in **each** direction with a smooth transition)

Airman Certification Standards:

- Altitude: +/- 100 feet
- Airspeed: +/- 10 Knots
- Heading: +/- 10 Degrees from Entry
- Bank Angle: +/- 5 Degrees

Common Errors:

- Failure to clear the area
- Inadequate pitch control
- Gain or loss of altitude
- Failure to maintain constant bank angle
- Poor coordination
- Premature rollout / Rollout after reference point
- Ineffective use of trim

Chandelles (Commercial Only)

The objective of a Chandelle is to complete a high performance, climbing 180º turn. The maneuver begins in level cruise flight and ends in a nose high altitude just above stall speed. This maneuver is divided into two 90º segments. The first 90º degree segment consists of a constant bank, varying pitch. The last 90º involves a constant pitch, and varying bank.

Procedure:

1. Pre-Maneuver Checklist
2. Select altitude for task to be completed no lower than **1,500 feet AGL**
3. Select 90º outside visual reference point, bug entry heading
4. Enter at **cruise speed, (100 to 115 kts)**
5. Roll into 30º of bank
6. Smoothly Add Full Power
7. Hold bank constant and slowly increase pitch until to the 90º visual reference point
8. At the 90º reference point, hold constant pitch, while decreasing the bank.
9. Slow to minimum controllable airspeed. Hold this airspeed for a few moments before returning to cruise flight
10. Lower nose and return to cruise without losing altitude

Airman Certification Standards:

- Bank Angle: 30º – first 90º of turn
- Airspeed: Just above stall speed
- Heading: +/- 10 degrees at 180° point

Common Errors:

- Failure to clear the area
- Initial bank is too shallow resulting in a stall
- Initial bank is too steep resulting in failure to gain maximum performance
- Allowing the bank angle to increase after initial establishment
- Allowing the pitch attitude to increase as the bank is rolled out during the second 90º of turn
- Pitch attitude is too low resulting in airspeed well above stall speed
- Performing maneuver by reference to flight instruments rather than outside visual points
- Failure to maintain adequate altitude control during the maneuver
- Poor coordination, or Stalling at any point throughout the maneuver
- Not scanning for traffic throughout the maneuver
- Failure to maintain orientation as the maneuver progresses
- Rolling out of turn too early
- Ineffective use of trim

Lazy Eights (Commercial Only)

The objective of Lazy Eights is for the pilot to develop proper coordination of the flight controls over a wide range of airspeeds and altitudes. This is the only maneuver at which the control inputs are constantly changing.

Procedure:

1. Pre-Maneuver Checklist
2. Select altitude for task to be completed no lower than **1,500 feet AGL**
3. Select outside visual points (45º, 90º, and 135º), bug reference heading
4. Enter at **cruise speed, (100 to 115 kts)**
5. Begin by slowly increasing pitch and bank
6. At the 45º point the aircraft should be at its maximum pitch up point, and 15º of bank
7. Continue increasing bank and lowering pitch to the 90º point. At the 90º point the aircraft should be at its maximum bank approximately 30º, with level pitch. The airspeed should be approximately just above stall speed
8. Slowly begin decreasing bank and lowering pitch to the 135º point. At the 135º point, the aircraft should be at the maximum pitch down and 15º bank
9. Slowly increase pitch and continue to decrease bank at a constant rate to bring the aircraft to the 180º point. The aircraft should be at the same altitude and airspeed at which the maneuver began
10. Repeat this procedure in the opposite direction, ending the maneuver at the initial entry heading, altitude, and airspeed. Use the same reference points. The initial 135º point will be the new 45º, the 90º degree point remains the 90º point, and the initial 45º is now the 135º point

Airman Certification Standards:

- Bank Angle: Approximately 30 degrees at steepest point
- Altitude at 180° Point: +/- 100 feet from starting altitude
- Airspeed at 180° Point: +/- 10 knots from starting airspeed
- Heading at 180° Point: +/- 10 degrees from stating heading

Common Errors:

- Failure to clear the area
- Poor selection of visual reference points
- Failure to maintain adequate altitude control during the maneuver
- Maneuver is not symmetrical
- Poor coordination or stalling at any point throughout the maneuver
- Failure to manipulate the controls in a smooth and continuous manner
- Failure to maintain orientation as the maneuver progresses.

Steep Spiral (Commercial Only)

The objective of a Steep Spiral is to provide a flight maneuver for rapidly dissipating substantial amounts of altitude while remaining over a selected point on the ground. A steep spiral is a gliding turn effective for emergency descents or landings.

Procedure:

1. Pre-Maneuver Checklist
2. Select altitude for task to be completed no lower than **1,500 feet AGL**
3. Select ground reference point, outside visual reference, and bug heading
4. Enter maneuver downwind
5. Power idle upon entry
6. Pitch and trim for best glide (**76 to 79) knots**, maintain **best glide** throughout the maneuver
7. Roll into a steep banked turn not to exceed 60º
8. Complete three full turns around reference point maintaining constant radius
9. Add full power for a moment on each upwind to clear engine
10. After three turns, exit maneuver on entry heading
11. Add power and return to cruise flight

Airman Certification Standards:

- :Bank Angle: Not to exceed 60 degrees at steepest point
- Airspeed: +/- 10 knots
- Heading: +/- 10 degrees on rollout
- Altitude – perform at least three (3) 360° turns completing maneuver no lower than 1500’ AGL
- Maintain a constant radius about a suitable ground point

Common Errors:

- Failure to clear the area
- Performing maneuver by reference to flight instruments rather than outside visual points
- Failure to maintain adequate altitude control during the maneuver
- Stalling at any point throughout the maneuver
- Poor coordination
- Not scanning for traffic throughout the maneuver
- Failure to maintain orientation as the maneuver progresses
- Rolling out of turn too early
- Ineffective use of trim

Slow Flight and Stalls

Maneuvering During Slow Flight

The objective of Slow Flight is to understand the flight characteristics and how the airplane's flight controls feel when operating in a near-stall condition.

Procedure:

1. Pre-Maneuver Checklist
2. Select altitude for task to be completed no lower than **1,500 feet AGL**
3. Select outside visual reference, bug reference heading
1. Reduce power*, maintain heading and altitude as the airplane slows.*
4. Flaps in smoothly to FULL when able
5. Maintain ~ **55** - **60 knots**, power as necessary (or just above the stall warning horn)
6. **On recovery**, full power, retract flaps to **25º**
7. Reaching approximately 70 kts retract flaps to **10º**
8. Reaching approximately 80 kts retract flaps to **0º**
9. Maintain altitude and heading throughout the recovery

Airman Certification Standards:

- Altitude: +/- 100 feet (+/- 50 feet for Commercial)
- Airspeed: + 10, -0 Knots (+5, -0 knots for Commercial)
- Heading: +/- 10 Degrees
- AOB: +/- 10 Degrees (+/- 5º Degrees for Commercial)

Common Errors:

- Failure to clear the area
- Inadequate back pressure to maintain airspeed
- Excessive elevator resulting in climb
- Insufficient right rudder
- Inadequate power management to maintain altitude
- Failure to respond to stall warning

Power-Off Stall

The objective of the Power-Off Stall maneuver is to simulate and recover from a stall on approach to land.

Procedure:

1. Pre-Maneuver Checklist
2. Select altitude for task to be completed no lower than **1,500 feet AGL**
3. Select outside visual reference, bug reference heading
4. Reduce power*, maintain heading and altitude as the airplane slows.*
5. Flaps in sequence to **FULL**
6. Descend at **65 knots** to simulate a descent to landing.
7. Pitch up to **8º** to **12º** above the horizon simulating a flare. Hold this angle.
8. Once stall occurs, **recover** by *simultaneously* reducing angle of attack, adding **FULL POWER**, and retracting flaps to **25º**
9. Reaching **70 to 80 kts** and positive rate, retract flaps to **10º**
10. Reaching **90 kts** and positive rate, retract flaps to **0º**

    For Commercial - *Pitch for* ***First Indication of Stall*** *(Imminent Stall - buffet or stall horn, whichever occurs first) UNLESS instructed by evaluator to induce full stall*

Airman Certification Standards:

- Heading: +/- 10 Degrees (if straight and level)
- AOB: Not to exceed 20 Degrees +/-10 if in a turn (+/- 5 for Commercial)

Common Errors:

- Failure to clear the area
- Inability to recognize impending stall
- Poor coordination
- Failure to establish descent
- Inadvertent secondary stall
- Recovery prior to entering stalled condition

Power-On Stall

The objective of a Power-On Stall is to practice recognizing, and recovering from a stall during climb, or go-around.

Procedure:

1. Pre-Maneuver Checklist
2. Select altitude for task to be completed no lower than **1500 feet AGL**
3. Select outside visual reference, bug reference heading
4. Reduce power*, maintain heading and altitude as the airplane slows.*
5. Reaching **70 - 75 knots**, *simultaneously* increase pitch, and apply **Full Power**
6. Slowly increase pitch to **20º to 22º** above the horizon and hold this angle.
7. Upon reaching full stall condition, (first indication if Commercial), **recover** by reducing the angle of attack, then pitch for climb
8. Level off and return to cruise flight

Airman Certification Standards:

- Heading: +/- 10 Degrees (if straight and level)
- AOB: Not to exceed 20 Degrees +/-10 if in a turn

Common Errors:

- Failure to clear the area
- Inability to recognize impending stall
- Poor coordination
- Inadvertent secondary stall
- Recovery prior to entering stalled condition.

Accelerated Stall (Commercial Only)

The objective of the accelerated stall maneuver is to demonstrate a stall at airspeeds greater than 1+G. Accelerated stalls are performed with 45º of bank, to demonstrate how bank angle and airspeed affect stall characteristics. Select entry altitude no lower than 3,000' AGL.

Procedure:

1. Pre-Maneuver Checklist
2. Select altitude for task to be completed no lower than **3,000 feet AGL**
3. Select outside visual reference, set heading bug
4. Slow to **90 knots** *maintaining heading and altitude*
5. Upon reaching 90 knots, bring power to idle, smoothly enter 45º bank turn
6. Apply backpressure and maintain altitude to induce stall
7. Pitch for first indication of stall (buffet or stall horn, whichever occurs first)
8. Once first indication is acknowledged, **recover** by *simultaneously* reducing angle of attack, adding **FULL POWER**, and leveling wings, return to entry heading or heading assigned by evaluator.
9. Cruise checklist

Airman Certification Standards:

- Heading: Return to heading as designated by evaluator
- Altitude: Return to altitude as designated by evaluator
- Airspeed: Return to airspeed as designated by evaluator
- AOB: 45º coordinated

Common Errors:

- Failure to clear the area
- Inability to recognize impending stall
- Poor coordination
- Inadvertent secondary stall
- Recovery prior to entering stalled condition

Normal Takeoff

The objective of a Normal Takeoff is to perform a takeoff under standard conditions.

Procedure:

1. Complete Before Take-off Checklist and Take-off Briefing
2. Once clearance is obtained to take-off, visually check final for traffic and verify Runway with a callout, "Runway ____ verified"
3. Line up on centerline and smoothly advance throttle to **FULL POWER**
4. Callout "airspeed alive"
5. Accelerate to V_R **55 knots**, apply backpressure and allow the airplane to lift off.
6. Pitch for 7.5º-10º and climb out at **Vy (76 knots)**
7. Maintain coordination with right rudder
8. Maintain runway centerline using wind drift correction
9. At **1,000' AGL**, perform Climb Checklist

Airman Certification Standards:

- Maintain Vy**:** +10 Knots / -5 Knots to safe maneuvering altitude (+5/-5 for Commercial)

Common Errors:

- Failure to maintain runway centerline
- Failure to add adequate right rudder
- Rotating at too low or too high airspeeds
- Failure to adequately clear Final Approach

Normal Landing

The objective of a Normal Landing is to maintain positive control of the airplane in normal configuration.

Procedure:

1. Perform the Before Landing Checklist before entering the pattern.
2. Enter downwind on a 45º angle at midfield
3. **Downwind**- reduce power and slow to around **100 knots**
4. ***Abeam touchdown point***: reduce power to **1,500 to 1,900 RPM**, check speed and extend flaps to **10º** slowing to approximately **~90 knots**
5. **Base**- extend flaps to **25º** slowing to **~80 knots**
6. **Final**- extend flaps to 4**0º,** slowing to **~70 knots,** aiming for the runway numbers.
7. Flare so that the main tires touchdown first at near stalling speed, gently letting the nose down on the centerline
8. Align the longitudinal axis of the aircraft with the centerline using rudder correction
9. Use brakes as necessary

Airman Certification Standards:

- Maintain crosswind correction and directional control throughout approach and landing
- Touch down at proper pitch attitude
- Touch down within 400 feet beyond, on a specified point (within 200 feet for Commercial)
- Touch down with airplane's longitudinal axis aligned with and over centerline

Common Errors:

- Failure to maintain stabilized approach
- Failure to apply wind correction
- Sideloading the aircraft
- Landing off centerline

Go Around

Utilize the Go-Around procedure if the landing environment is fowled or unsafe, a stabilized approach cannot be achieved, or the landing / touchdown is unsafe.

Procedure:

1. **FULL POWER, PITCH FOR CLIMB (~8º above the horizon)**
2. Flaps retract to **25º**
3. Pitch for **Vy (76 kts)**
4. **Positive rate of climb and side step if necessary**, retract flaps to **10º**
5. Retract remaining flaps to **0º** and pitch for **Vy (76 knots)**
6. Announce to tower that you are going around
7. Fly normal pattern or amended pattern if instructed

Airman Certification Standards:

- Apply takeoff (Full) power immediately and transition to climb +10 Knots / -5 Knots (±5 knots for Commercial)
- Maintain **Vy** to safe maneuvering altitude

Common Errors:

- Failure to add full power and pitch for a climb
- Failure to Retract flaps as required

Short Field Takeoff

The objective of a Short Field Takeoff is to simulate taking off from a short runway, with obstacles.

Procedure:

1. Complete Before Take-off Checklist and Take-off Briefing
2. Once clearance is obtained to take-off, visually check final for traffic and verify Runway with a callout, "Runway ____ verified"
3. Use all available runway, line up on centerline, apply brakes firmly, and apply full power slowly
4. Verify engine in parameters
5. Release brakes and smoothly accelerate
6. Call out "airspeed alive" and "rotate" at appropriate times **(Vr ~55 kts**)
7. Climb out at **64 knots** with flaps **25º**
8. Once clear of 50 ft. obstacle and at a safe altitude, accelerate to **Vy (76 knots)** and retract flaps **slowly** to prevent sinking
9. Maintain coordination with right rudder pressure
10. At **1,000 ft. AGL**, transition to cruise climb **87 knots** and perform climb checklist

Airman Certification Standards:

- Rotate and lift off at **Vx (64 knots)** +10 Knots / -5 Knots (+/-5 Knots for Commercial)
- Maintain pitch attitude that will maintain **Vx** until obstacle is cleared by 50 feet
- After clearing obstacle maintain **Vy (76 knots):** +10 Knots/ -5 Knots (until safe maneuvering altitude) (+/-5 Knots for Commercial)

Common Errors:

- Failure to adequately apply brakes
- Failure to utilize all available runway
- Rotating at too high or too low airspeeds
- Failure to maintain Vx until obstacle cleared
- Failure to maintain Vy during climb out

Short Field Landing

The objective of a short field landing is to simulate landing on a short runway.

Procedure:

1. Perform the Before Landing Checklist before entering the pattern.
2. Enter downwind on a 45º angle at midfield
3. **Downwind**- reduce power and slow to around **100 knots**
4. ***Abeam touchdown point***: reduce power to **1,500 to 1,900 RPM**, check speed and extend flaps to **10º** slowing to approximately **~90 knots**
5. **Base**- extend flaps to **25º** slowing to **~80 knots**
6. **Final**- extend flaps to 4**0º,** slowing to **~65 knots,** aiming for just short of the touchdown point.
7. Use power to adjust sink rate and pitch for airspeed. Once landing is assured, power to idle and touchdown at slowest possible airspeed
8. Carefully retract the flaps, use maximum braking without skidding the tires, yoke full aft for aerodynamic braking and maintain centerline and wind correction
9. Taxi clear of runway and perform “after landing” checklist

Airman Certification Standards:

- Land on designated touchdown point: +200 feet / -0 feet. (+100/-0 feet for Commercial)

Common Errors:

- Touching down prior to designated landing point
- Landing too far past the touch down point
- Failure to maintain runway centerline
- Sideloading the airplane
- Unstable approach
- Approach too flat (obstacle)

Soft Field Takeoff

The objective of the Soft Field Takeoff procedure is to simulate taking off from an unimproved runway i.e. grass, dirt, or gravel runway. Pressure is held off the nose wheel to prevent the nose gear from sinking into an unimproved surface during takeoff roll. Ground effect is used to allow the aircraft to accelerate prior to climb.

Procedure:

1. Use aft yoke pressure during taxi. Complete Before Take-off Checklist and Take-off Briefing
2. Once clearance is obtained to take-off, visually check final for traffic and verify Runway with a callout, "Runway ____ verified"
3. Line up on centerline without stopping and smoothly advance throttle to **FULL POWER**
4. Use back pressure on the yoke to lift the weight off the nose gear. Once the nose wheel comes up, reduce aft pressure. Call out "airspeed alive"
5. Lift off at the lowest possible airspeed. Do not allow aircraft to settle back on to the runway
6. Maintain aircraft in ground effect (half wingspan from the surface) and accelerate to Vx **64 knots (for obstacle) or Vy 76 knots (for no obstacle)**
7. Once clear of obstacle, accelerate to **Vy (76 knots)**and with a positive rate of climb, retract flaps smoothly to **0º**
8. Maintain coordination with right rudder pressure
9. Maintain runway centerline using wind drift correction

Airman Certification Standards:

- Remain in ground effect while accelerating
- During climb to safe maneuvering altitude, maintain Vx or Vy : +10 Knots / -5 Knots (+/-5 Knots if Commercial)

Common Errors:

- Failure to remain in ground effect
- Climbing out at airspeed below Vx

Soft Field Landing

The objective of a soft field landing is to simulate landing on a soft field. Care must be taken to keep the nosewheel off the ground for as long as possible during landing on an actual unimproved field, nose wheel may become lodged into the runway if too much weight is placed on the nose gear**.**

Procedure:

1. Perform the Before Landing Checklist before entering the pattern.
2. Enter downwind on a 45º angle at midfield
3. **Downwind**- reduce power and slow to around **100 knots**
4. ***Abeam touchdown point***: reduce power to **1,500 to 1,900 RPM**, check speed and extend flaps to **10º** slowing to approximately **~90 knots**
5. **Base**- extend flaps to **25º** slowing to **~80 knots**
6. **Final**- extend flaps to 4**0º,** slowing to **~65 knots,**
7. Maintain **65 knots** on final and carry some power all the way down to touchdown
8. Land on the main wheels softly and hold the nose gear off the ground, continue to hold back pressure and slowly reduce power to idle
9. Use wind correction inputs and maintain centerline
10. Taxi clear of the runway with yoke full aft and perform the “after landing” checklist

Airman Certification Standards:

- Touch down at proper pitch attitude with minimum sink rate
- Touch down with no side drift
- Touch down with airplanes longitudinal axis aligned with runway centerline

Common Errors:

- Failure to hold nose off the ground during landing
- Landing too hard
- Failure to land with longitudinal axis aligned with centerline
- Unstable approach
- Approach too flat/shallow

Power Off 180º Accuracy Approach and Landing (Commercial Only)

The objective of a Power Off 180º accuracy approach is to land on a designated touchdown point on the runway, after a gliding, 180º turn from downwind, to final. Be sure to ask tower for permission to execute a “short approach” before beginning maneuver.

Procedure:

1. Perform the Before Landing Checklist and Select intended touchdown point
2. Bring power to idle when abeam touchdown point and pitch for best glide
3. Length of downwind is dependent on wind
4. Turn base and final to glide to touchdown point
5. Add flaps **if** and **as** necessary
6. Land on designated touchdown point
7. Taxi clear of runway and perform “after landing” checklist

Airman Certification Standards:

- Land on designated touchdown point: +200 / -0 feet

Common Errors:

- Touching down prior to designated landing point
- Landing too far past the touch down point
- Failure to maintain runway centerline
- Sideloading the airplane

Situational / Emergency Maneuvers

Forward Slip to Land

The objective of the Forward Slip to land, is to lose altitude in the instance of a high approach.

Procedure:

1. Perform appropriate landing approach procedures
2. To begin the slip**, Power- Idle**
3. Lower the upwind wing, pitch down and use opposite rudder to maintain centerline (same as crosswind correction)
4. The amount of altitude lost is controlled by the slip, i.e. amount of aileron and rudder deflection, as well as nose down attitude
5. Maintain an airspeed above **80 knots**
6. Once on proper glide path, re-establish normal approach and landing. Transition to **70 knots** on short final, flaps as needed
7. After exiting runway perform “after landing” checklist

Lost Procedures

Lost procedures are practiced preparing pilot for the possibility of becoming unaware of their location. These are the basic procedures but could vary in sequence due to airspace or terrain.

Procedure:

1. **CLIMB**- better view, and better navigation reception
2. **CIRCLE**- remain in general vicinity, this is important, so you do not become more lost, or fly into airspace, terrain, or weather
3. Use Garmin nearest airport feature.
4. Use two different VOR’s to triangulate your position
5. **CONFESS**- Confess to yourself that you are lost and that you cannot help yourself and need help; write down time determined lost
6. **CONSERVE-** lean mixture for best economy operation and reduce power to max endurance; check fuel state and determine how much time you have
7. **COMMUNICATE-** request assistance on any working frequency; PAN-PAN; Set 7700
8. **COMPLY-** Follow ATC instructions

Diversion

The diversion procedure is practiced so that the pilot is aware of the tasks required to divert to another airport in the case of emergency, weather, or maintenance.

Procedure:

1. Recognize a situation that requires a diversion
2. Write down time and identify current location on chart
3. Turn to estimated heading, avoiding any obstacles or airspace
4. Determine exact heading and turn on course
5. Determine Distance
6. Determine Groundspeed
7. Determine Time Enroute ETA
8. Determine Fuel required

Emergency Descent

An emergency descent is practiced simulating emergency situations that require a rapid descent. Two scenarios are often used during check rides. One scenario is that of a hypoxic passenger. Another is the simulation of an engine/wing fire.

Procedure:

1. Pre-Maneuver checklist complete
2. ENSURE AREA BELOW IS CLEAR

Select appropriate landing area

1. Power - Idle
2. SIMULATE – LEAN
3. SIMULATE – Fuel selector Off
4. SIMULATE – Magnetos Off
5. Pitch for 120 Knots
6. Turn left so pilot can maintain visibility below
7. Select altitude at which simulated fire will be extinguished
8. Continue to engine out / emergency landing checklist

Emergency Approach and Landing (Simulated)

Emergency approach and landing procedure is typically conducted as a simulated engine failure.

Procedure:

1. **A** - Pitch for BEST GLIDE **AIRSPEED** – **Vg (76 Knots)**
2. **B** - Select **BEST** PLACE TO LAND look for flat fields, freeways, private airports
3. **C** - Conduct EMERGENCY LANDING **CHECKLIST**

Recovery from Unusual Attitudes

This procedure is practiced so that the pilot knows how to respond to unusual attitudes in instrument flight. These procedures have been established to quickly, and safely return the aircraft to straight and level flight, while minimizing a potential stall, or stress to the aircraft.

Procedure:

1. Pre-Maneuver checklist complete

Nose High / Airspeed slowing

1. Full throttle
2. Allow the nose to fall to the horizon
3. Roll wings level

Nose Low / Airspeed accelerating

1. Throttle idle
2. Wings level
3. Pitch for level flight

Airman Certification Standards:

- Recognize the unusual flight attitudes
- Perform the correct flight control configuration / inputs

Common Errors:

- Failure to interpret flight instruments
- Failure to recover in the proper configuration or sequence

Instructor Maneuvers (Demos)

Cross Controlled Stalls

The objective of a cross controlled stall demonstration is to show the student how an improper cross control /uncoordinated turn on a simulated base-to-final turn could result in a stall.

Procedure:

1. Pre-Maneuver Checklist
2. Select altitude for task to be completed no lower than **1,500 feet AGL**
3. Select outside visual reference, bug reference heading
4. Slow the airplane and extend flaps to **25º** simulating a descending base leg
5. Begin a 30 bank to the left. Apply excessive rudder in the direction of the turn (bottom rudder)
6. Simulate a panic response by applying abrupt opposite aileron and back pressure until a stall indication (usually the horn or a buffet).
7. Recover by decreasing angle of attack and level the wings. Regain coordinated flight
8. Apply full power and climb to starting altitude

Airman Certification Standards:

- Exhibits instructional knowledge

Common Errors:

- Failure to clear the area
- Failure to establish correct configuration
- Improper demonstration of recovery
- Failure to establish a cross-controlled turn and stall condition that will adequately demonstrate the hazards of a cross controlled stall.

Elevator Trim Stall

The objective of an elevator trim stall demonstration is to show the student how a sudden change in speed or thrust could result in a trim setting that will cause a stall.

Procedure:

1. Pre-Maneuver Checklist
2. Select altitude for task to be completed no lower than **1,500 feet AGL**
3. Select outside visual reference, bug reference heading
4. Slow the airplane to **~65 kts** and extend flaps to **40º** simulating a descent to final.
5. Trim the airplane
6. Smoothly apply full power and allow the pitch attitude to increase in excess of normal climb.
7. Recover at first indication by decreasing angle of attack, and level the wings. Apply nose down trim as necessary and retract the flaps to **25º** immediately
8. Return to starting altitude, speed, and **0º** flaps

Airman Certification Standards:

- Exhibits instructional knowledge

Common Errors:

- Failure to clear the area
- Failure to establish correct configuration
- Improper demonstration of recovery
- Failure to establish an elevator stall condition that will adequately demonstrate the hazards of an elevator trim stall.

Secondary Stall

The objective of secondary stall demonstration is to show the student how an improper stall recovery can lead to remaining stalled.

Procedure:

1. Pre-Maneuver Checklist
2. Select altitude for task to be completed no lower than **1,500 feet AGL**
3. Select outside visual reference, bug reference heading
4. Slow the airplane to **~65 kts** and extend flaps to **40º**
5. Execute a Power-off stall.
6. As the airplane stalls, DO NOT release the backpressure and add full power.
7. Note how the airplane pitches up and buffets a second time.
8. Reduce the angle of attack and recovery normally as a Power-off Stall.

Airman Certification Standards:

- Exhibits instructional knowledge

Common Errors:

- Failure to clear the area
- Failure to establish correct configuration
- Improper demonstration of recovery
- Failure to establish a secondary stall condition that will adequately demonstrate the hazards of not reducing the angle of attack during a stall