Pegasus Aviation SOP

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V Speeds (KIAS)

V_R	Rotate Speed	55
V_X	Best Angle Climb (10,000')	64 (62)
V_Y	Best Rate Climb (10,000')	78 (68)
V_{SO}	Stall in Landing Configuration	41
V_{S1}	Stall w/ Flaps Retracted	47
V_A	Maneuvering Speed 2300 lbs 1950 lbs 1600 lbs	 97 89 80
V_{NO}	Max Structural Cruising	128
V_{NE}	Never Exceed	160
V_{FE}	Max Flaps Extended	85
Best Glide	Best Glide (Flaps Extended)	65 (60)
X-Wind	Max Demonstrated Crosswind Component	15
Pattern	Downwind Base Final	80 70 60
Cruise Climb		80-85

Pre-Maneuver Checklist

Description

Performing clearing turns and radio calls before every maneuver clears the area of potential traffic conflicts. Configuring the airplane as necessary for each specific maneuver is essential for completing a maneuver successfully to ACS standards.

Objective

Ensuring a safe operating area and that the plane is configured appropriately.

Procedure

1. **Clear.** Perform clearing turns: two – 90º turns in either direction, or one – 180º turn while scanning to ensure the area is clear of traffic conflicts.
2. **Call.** Make a radio call on the appropriate frequency stating who you are talking to, who you are, location you are maneuvering over, altitude, and intentions.
3. **Configure.** Use a flow to configure the aircraft accordingly.
    - Fuel Selector…….. both
    - Power…….. set
    - Mixture…….. set
    - Carb Heat…….. as necessary
    - Flaps…….. as necessary
    - Trim…….. as necessary
    - Lights…….. as necessary

ACS Standards

- Clear the area.
- Make radio calls as appropriate.
- Complete the appropriate checklist.

Traffic Pattern Operation

Description

The traffic pattern is used to create an orderly flow of traffic for airplanes arriving, departing and operating in the vicinity of airports. The pattern consists of arrival to and departure from an airport while performing pilot duties.

Objective

Understand how to conduct safe and efficient traffic pattern operations at controlled and uncontrolled airports.

Procedure

- **Obtain airport information.** Listen to automated weather, look for segmented circle with wind indicators, or contact CTAF to determine active runway.
- **Prepare for pattern entry.** Visualize pattern entry and complete before landing checklist.
- **Enter the pattern.** Use a 45° path to approach the midpoint of the airport towards the downwind leg at pattern altitude (typically 1000 AGL).
- **Downwind leg.** Fly parallel to the runway. At midfield apply carb heat and reduce throttle to 2,000 RPM and allow the aircraft to slow to 80 KIAS. Maintain pattern altitude with gradual increase in pitch and trim until abeam intended touchdown point, then begin a descent by decreasing power to 1500 RPM and maintain 80 KIAS. Flaps may be added to 10° when below V_{FE} (85 KIAS). Trim the aircraft.
- **Base leg.** When the intended touchdown point is approximately 45° behind the aircraft position make a 90° turn toward the runway. Add flaps to 20° and continue descent while pitching and trimming to slow to 70 KIAS.
- **Final leg.** Maintain 70 KIAS and make a 90° turn toward the runway, aligning the plane with the extended runway centerline. Add flaps to 30° or 40° depending on the type of landing if needed. Pitch and trim for 60 KIAS. Broadcast “touch and go” or “full stop” on CTAF if at an uncontrolled airport. “Heels on the floor and back” must be verbalized by the pilot flying on short final or go-around must be initiated.
- **Departure leg.** Climb at desired airspeed on runway heading until you are beyond the departure end of the runway.
- **Depart the pattern.** Continue climb on departure leg if departing straight out. If an offset/crosswind departure is desired, continue climb and extend departure before exiting. If downwind departure is desired, maintain pattern altitude until clear of the airport environment.
- **Closed traffic.** For continued laps in the traffic pattern continue climb on departure leg to at least 300 feet below traffic pattern altitude.
- **Crosswind leg.** Make a 90° turn away from the airport on the departure leg to the crosswind leg and continue climb to traffic pattern altitude.

ACS Standards

- Properly identify and interpret airport runways, taxiways, markings, signs, and lighting.
- Comply with recommended traffic pattern procedures
- Correct for wind drift to maintain proper ground track.
- Maintain orientation with the runway/landing area in use.
- Maintain traffic pattern altitude +/-100 feet, and appropriate airspeed +/-10 knots.
- Maintain situational awareness and proper spacing from other aircraft in the traffic pattern.

Normal and Crosswind Takeoff and Climb

Description

The airplane will be aligned with the runway centerline and the ailerons held into the wind. Takeoff power will be applied, and the airplane is allowed to accelerate to rotation speed at which time the pitch attitude is increased to establish a positive lift-off and a V_Y pitch attitude. Once airborne a wind correction angle will be established to maintain a ground track that is aligned with the runway centerline.

Objective

Develop student's ability to safely accomplish takeoff and departure under normal/crosswind conditions.

Procedure

1. **Prepare for takeoff.** Complete before takeoff checklist. Verify all engine gauges are within normal operating range. Ensure the runway as well as the approach and departure paths are clear of traffic.
2. **Taxi onto runway.** Line up on runway centerline, center the nosewheel, and neutralize the ailerons. Verify heading matches intended runway. Check windsock before beginning takeoff roll. If crosswind exists, apply full aileron deflection in the direction of wind.
3. **Add takeoff power.** Smoothly advance throttle to takeoff power. As the airplane starts to roll, select a reference point off the cowling through which the runway centerline passes. Apply right rudder to counteract engine torque and keep airplane aligned with runway centerline. Check engine instruments to ensure adequate performance and call out "engine instruments in the green." Verify airspeed indicator needle increasing and call out "airspeed alive."
4. **Adjust control pressure.** As aircraft accelerates, control pressures become more effective. Reduce rudder pressure to maintain directional control and apply slight back pressure on the yoke. If crosswind exists, reduce aileron input as practical to keep aircraft aligned with centerline.
5. **Lift off the runway.** Upon reaching V_R (55 KIAS), establish V_Y takeoff attitude and maintain nose position relative to the horizon using back pressure.
6. **Establish a climb attitude.** Accelerate to climb speed (V_Y) and climb out on departure leg on extended runway centerline. Use right rudder to counteract left turning tendencies.
7. **Stabilize the climb.** Once a safe altitude is reached, apply elevator trim to relieve control pressure. Complete after takeoff checklist and continue on course.

ACS Standards

- Complete the appropriate checklist.
- Make radio calls as appropriate.
- Verify assigned/correct runway.
- Ascertain wind direction with or without visible wind direction indicators.
- Position the flight controls for the existing wind.
- Clear the area; taxi into takeoff position and align the airplane on runway centerline.
- Confirm takeoff power and proper engine and flight instrument indications prior to rotation.
- Rotate and lift off at the recommended airspeed and accelerate to V_Y.
- Establish a pitch attitude to maintain manufacturer's recommended speed of V_Y
    - Private: +10/-5 knots,
    - Commercial +/-5 knots.
- Configure airplane in accordance with manufacturer's guidance.
- Maintain V_Y to a safe maneuvering altitude.
    - Private: +10/-5 knots

    - Commercial: +/-5 knots
- Maintain directional control and proper wind-drift correction throughout takeoff and climb.
- Comply with noise abatement procedures.

Normal and Crosswind Approach and Landing

Description

Align airplane with the runway centerline on final approach. The landing flap setting is made and a wind correction angle, is established if necessary. A stabilized (airspeed, approach descent angle and airplane configuration) final approach is established. At an appropriate altitude a transition to the landing pitch attitude is begun in a manner that will allow the airplane to touch down in the proper power-off stall pitch attitude. After touchdown the airplane is slowed to a normal taxi speed on the runway centerline and then taxied clear of the runway. Appropriate crosswind control is maintained throughout the final approach, landing and rollout.

Objective

To develop the student's ability to safely and accurately execute an approach, landing and rollout in normal and crosswind conditions.

Procedure

1. **Prepare for landing.** Ensure before landing checklist is complete. Scan for traffic and make sure area is clear in your flight path.
2. **Begin your descent.** As you approach the position abeam your intended landing point, you should be at traffic pattern altitude. At this point, reduce power to 1500 RPM. Once below V_{FE} (85 KIAS), set flaps to 10°. Lower the nose to maintain 80 KIAS and begin descent and retrim.
3. **Turn base.** Check and listen for traffic on base leg and on extended runway centerline. Begin your base turn when the airplane has descended 100-200 feet and the landing point is approximately 45° behind the wing. Set flaps to 20° and continue descent at 70 KIAS and retrim.
4. **Turn final.** Make sure final approach path is clear and turn final to roll out 300-500 feet AGL. Set flaps to 30°. Use proper coordination of pitch and power to begin slowing to 60 KIAS continue descent and retrim.
5. **Fly a stabilized approach**. Use outside visual references (VASI/PAPI if available) to determine proper descent angle or glidepath. Use pitch for airspeed and power for altitude and continue to adjust to maintain approach path. If a crosswind exists, use aileron correction into the wind and use rudder to keep airplane aligned with centerline. "Heels on the floor and back" must be verbalized by the pilot flying on short final or go-around must be initiated.
6. **Choose aiming point.** The aiming point should be where the descent angle intersects the runway and adding the appropriate distance that will be travelled in the flare. The aiming point should have no apparent relative movement in the windscreen.
7. **Begin the round out.** Upon reaching short final when landing is assured, pull power to idle and begin to slow the aircraft by maintaining sight picture of aiming point. Approximately 5 to 10 feet above the runway gradually increase back pressure on the yoke and decrease the rate of descent as you focus your eyes towards the end of the runway. If crosswind exists, increase aileron deflection into the wind as airspeed decreases.
8. **Begin the flare.** The airplane should reach a near-zero rate of descent just above the runway surface and near stall speed. Try to hold the airplane off the ground by increasing back pressure. Stall warning horn should be audible at this time.
9. **Touch down.** Maintain a nose high attitude until the main wheels come in contact with the runway. Keep back pressure on the yoke as long as control pressure remains effective to provide aerodynamic braking.
10. **Roll out.** Maintain directional control on centerline using rudders and aileron deflection into the wind if crosswind exists. Minimal to no braking should be required to reach taxi speed. Exit runway when applicable and allow the airplane to completely cross the hold short lines. Complete after landing checklist.

ACS Standards

- Complete the appropriate checklist.
- Make radio calls as appropriate.
- Ensure the airplane is aligned with the correct/assigned runway or landing surface.
- Scan the runway or landing surface and adjoining area for traffic and obstructions.

Normal and Crosswind Approach and Landing (continued)

- Consider the wind conditions, landing surface, obstructions, and select a suitable touchdown point.
- Establish the recommended approach and landing configuration and airspeed, and adjust pitch
- Maintain manufacturer's published approach airspeed or in its absence not more than 1.3 V_{SO}, with wind gust factor applied.
    - Private: +10/-5 knots
    - Commercial: +/-5 knots
- Maintain crosswind correction and directional control throughout the approach and landing.
- Make smooth, timely, and correct control application during round out and touchdown.
- Touch down at a proper pitch attitude, with no side drift, and with the airplane's longitudinal axis aligned with and over the runway center/landing path.
    - Private: +400/-0 feet
    - Commercial: +200/-0 feet
- Execute a timely go-around if the approach cannot be made within the tolerances specified above or for any other condition that may result in an unsafe approach or landing.
- Utilize runway incursion avoidance procedures.

Soft Field Takeoff and Climb

Description

To ensure adequate takeoff acceleration on a soft field, a nose high pitch attitude is continued during the takeoff roll in order to transfer the airplane's weight to the wings and then to lift off as soon as possible. After lifting off the airplane is flown in ground effect until a safe climb out speed is attained.

Objective

To develop the student's ability to obtain maximum performance from the airplane when taking off from a soft or rough field.

Procedure

1. **Prepare for takeoff.** Complete the before takeoff checklist. Set flaps to 10° and assure runway environment is clear.
2. **Taxi onto runway and begin takeoff.** As taxi begins, maintain full back pressure on the yoke to keep pressure off nosewheel. Avoid the use of brakes while taxing into position (cutting corner onto runway may be necessary).
3. **Accelerate to liftoff.** With full back pressure on the yoke, smoothly advance throttle to full power. As airspeed increases and the elevator becomes more effective, reduce back pressure slightly while continuing to minimize weight on nosewheel.
4. **Establish the initial climb.** As airplane becomes airborne (before V_R) reduce back pressure to achieve a level flight attitude just above the runway surface. Allow airplane to accelerate in ground effect until reaching V_X (64 KIAS) if clearing an obstacle or V_Y (78 KIAS) before starting to climb.
5. **Stabilize the climb.** After all obstacles are clear (50 feet), accelerate to V_Y (78 KIAS) and retract the flaps. Trim to relieve control pressures and continue climb at V_Y .

ACS Standards

- Complete the appropriate checklist.
- Make radio calls as appropriate.
- Verify assigned/correct runway.
- Ascertain wind direction with or without visible wind direction indicators.
- Position the flight controls for the existing wind conditions.
- Clear the area, maintain necessary flight control inputs, taxi into takeoff position and align the airplane on the runway centerline without stopping, while advancing the throttle smoothly to takeoff power.
- Confirm takeoff power and proper engine and flight instrument indications.
- Establish and maintain a pitch attitude that will transfer the weight of the airplane from the wheels to the wings as rapidly as possible.
- Lift off at the lowest possible airspeed and remain in ground effect while accelerating to V_X or V_Y, as appropriate.
- Establish a pitch attitude for V_X or V_Y, as appropriate, and maintain selected airspeed during the climb.
    - Private: +10/-5 knots
    - Commercial: +/-5 knots
- Configure the airplane after a positive rate of climb has been verified or in accordance with airplane manufacturer's instructions.
- Maintain V_X or V_Y, as appropriate, to a safe maneuvering altitude.
    - Private: +10/-5 knots
    - Commercial: +/-5 knots
- Maintain directional control and proper wind-drift correction throughout takeoff and climb.
- Comply with noise abatement procedures.

Soft Field Approach and Landing

Description

An approach to and landing on a soft or rough runway. Power can be used during the round-out and flare to provide a high degree of control so that the touchdown is as gentle and slow as possible. The nose gear should be lowered gently to the runway surface after the main gear is on the runway and brakes should be applied as necessary as to not allow excess weight on the nosewheel.

Objective

To develop the student's ability to obtain maximum performance from the airplane so that a soft touchdown at the slowest possible airspeed can be made.

Procedure

1. **Prepare for landing.** Complete before landing checklist. Execute downwind, and base as normal.
2. **Fly a stabilized approach.** Maintain normal descent angle unless obstacles are present. After turning final add flaps to 30º, and then 40º. "Heels on the floor and back" must be verbalized by the pilot flying on short final or go-around must be initiated.
3. **Flare and touch down.** Just prior to the round out, reduce power to idle and continue flare with stall horn audible as main wheels touch down with nose-high pitch. If necessary, a slight addition of power during touchdown will aid in softening the landing.
4. **Roll out.** Hold sufficient back elevator pressure to keep the nose wheel off the ground until it can no longer be held off the surface. Avoid the use of brakes as necessary to not allow excess weight to be applied to the nosewheel.

ACS Standards

- Complete the appropriate checklist.
- Ensure the airplane is aligned with the correct/assigned runway.
- Scan the landing runway and adjoining area for traffic and obstructions.
- Consider the wind conditions, landing surface, obstructions, and select a suitable touchdown point.
- Establish the recommended approach and landing configuration and airspeed and adjust pitch attitude and power as required to maintain a stabilized approach.
- Maintain manufacturer's published airspeed or in its absence not more than 1.3 V_{S0}
    - Private: +10/-5 knots
    - Commercial: +/-5 knots
- Maintain crosswind correction and directional control throughout the approach and landing.
- Make smooth, timely, and correct control inputs during the round out and touchdown, for tricycle gear airplanes, keep the nose wheel off the surface
- Touch down at a proper pitch attitude with minimum sink rate, no side drift, and with the airplane's longitudinal axis aligned with the center of the runway.
- Maintain elevator as recommended by manufacturer during rollout and exit the "soft" area at a speed that would preclude sinking into the surface.
- Execute a timely go-around if the approach cannot be made within tolerances specified above or for any other condition that may result in an unsafe approach or landing.
- Maintain proper position of the flight controls and sufficient speed to taxi while on the soft surface.

Short Field Takeoff and Maximum Performance Climb

Description

The airplane is accelerated to liftoff speed in the shortest distance possible and established in a maximum angle climb until all obstacles are cleared.

Objective

To develop the student's ability to obtain maximum performance from the airplane while executing a short-field takeoff and safely clearing all obstacles in the departure path.

Procedure

1.	**Prepare for Takeoff.** Complete before takeoff checklist. Verify flaps are retracted.
2.	**Taxi onto runway.** Taxi into position at the very beginning of runway to allow maximum utilization of available takeoff distance. Align airplane on centerline and stop.
3.	**Add takeoff power.** Smoothly and continuously apply takeoff power while maintain pressure on the brakes. Check static RPM (2330), release brakes and call out when airspeed is alive.
4.	**Accelerate to liftoff.** Accelerate with yoke in a neutral position. Smoothly and firmly apply back pressure at the applicable airspeed depending on takeoff weight: 2300 lbs: 52 KIAS 2100 lbs: 50 KIAS 1900 lbs: 47 KIAS
5.	**Establish initial climb.** Pitch for and maintain applicable climb airspeed depending on takeoff weight until obstacle is clear (50 feet): 2300 lbs: 59 KIAS 2100 lbs: 56 KIAS 1900 lbs: 54 KIAS
6.	**Stabilize the climb.** Once obstacle is cleared, lower nose to V_Y, trim to relieve control pressures and continue climb.

ACS Standards

- Complete the appropriate checklist.
- Make radio calls as appropriate.
- Verify assigned/correct runway.
- Ascertain wind direction with or without visible wind direction indicators, position the flight controls for the existing wind conditions.
- Clear the area, taxi into takeoff position and align the airplane on the runway centerline utilizing maximum available takeoff area.
- Apply brakes while setting engine power to achieve maximum performance.
- Confirm takeoff power before brake release, verify proper engine/flight indications before rotation.
- Rotate and lift off at the recommended airspeed and accelerate to the recommended obstacle clearance airspeed or V_X.
    - Private: +10/-5 knots
    - Commercial: +/-5 knots
- Establish a pitch attitude that will maintain the recommended obstacle clearance airspeed or until the obstacle is cleared or until the airplane is 50 feet above the surface.
    - Private: +10/-5 knots
    - Commercial: +/-5 knots
- After clearing obstacle, establish pitch attitude for V_Y, and accelerate to and maintain Vy during the climb.
    - Private: +10/-5 knots
    - Commercial: +/-5 knots
- Configure the airplane in accordance with the manufacturer's guidance after a positive rate of climb has been verified.
- Maintain V_Y to a safe maneuvering altitude.
    - Private: +10/-5 knots
    - Commercial: +/-5 knots
- Maintain directional control and proper wind-drift correction throughout takeoff and climb.
- Comply with noise abatement procedures.

Short Field Approach and Landing

Description

A short field approach and landing is accomplished at an airport with a limited runway length, unfavorable runway gradient, required downwind landing, high density altitude or a combination of these factors. The round out and flare is accomplished in a manner that allows the airplane to reach the power-off stall pitch attitude as the main landing gear touches the runway. The rollout is minimized by proper use of aerodynamic deceleration and maximum applicable use of brakes.

Objective

To develop the student's ability to safely and accurately accomplish maximum performance and precession approaches and landings.

Procedure

1.	**Prepare for landing.** Complete before landing checklist. Execute downwind, and base as normal.
2.	**Stabilize the approach.** Turn final at least 300 - 500 AGL. Add flaps to 30°, and then 40° as landing is assured. Maintain steeper than normal approach path. Choose an aiming point that will allow for minimal float at flare and touchdown. "Heels on the floor and back" must be verbalized by the pilot flying on short final or go-around must be initiated.
3.	**Flare and touch down.** As flare begins, smoothly reduce power to idle and allow airplane to land in a fully stalled condition on the main wheels with little to no float.
4.	**Roll out.** After touchdown maintain back elevator pressure for maximum aerodynamic braking. Apply maximum braking to minimize rollout without locking the brakes. **This procedure should be conducted with normal braking and verbalize "maximum braking".**

ACS Standards

- Complete the appropriate checklist.
- Make radio calls as appropriate.
- Ensure the airplane is aligned with the correct/assigned runway.
- Scan the landing runway and adjoining area for traffic and obstructions.
- Consider wind conditions, landing surface, obstructions, and select a suitable touchdown point.
- Establish the recommended approach and landing configuration and airspeed and adjust pitch attitude and power as required to maintain a stabilized approach.
- Maintain manufacturer's published airspeed or in its absence not more than 1.3 V_{S0}, with gust factor applied.
    - Private: +10/-5 knots
    - Commercial: +/-5 knots
- Maintain crosswind correction/directional control throughout the approach and landing.
- Make smooth, timely, and correct control application during the round out and touchdown.
- Touch down at proper pitch attitude, with no side drift, min float, and with airplane's long. axis aligned with and over runway centerline.
    - Private: +200/-0 feet
    - Commercial: +100/-0 feet
- Execute a timely go-around if the approach cannot be made within the tolerances specified above or for any other condition that may result in an unsafe approach or landing.

No Flap Landing

Description

The airplane is landed without the use of the flaps.

Objective

To develop the student's ability to land the aircraft in a situation that would cause the flap system to become inoperative.

Procedure

1. **Final Approach.** Fly a normal traffic pattern and set an aiming point to land within the first 1/3 of the runway. Leave flaps retracted and maintain higher than normal approach speed at 70 KIAS. The descent angle should be expected to be shallower than flying an approach with flaps. "Heels on the floor and back" must be verbalized by the pilot flying on short final or go-around must be initiated.
2. **Maintain aiming point.** Continue descent at 65 KIAS and maintain aiming point using power for altitude control, and pitch for airspeed control.
3. **Touchdown.** Upon reaching short final when landing is assured, pull power to idle and begin to slow the aircraft by maintaining sight picture of aiming point. At round out increase back elevator pressure to continue to slow the aircraft until flare and touchdown. Keep nosewheel off the runway as long as possible. Ground roll should be expected to be longer due to faster approach speed.

ACS Standards

- Describe the appropriate action for simulated emergencies specified by the evaluator.
- Complete the appropriate checklist

Forward Slip to a Landing

Description

A slip occurs when the bank angle of an airplane is too steep for the rate of turn. The airplane is in essence flying sideways, increasing drag and therefore increasing the rate of descent without increasing the airspeed.

Objective

The student should develop knowledge of the elements related to forward slips, as well as sideslips and have the ability to perform either on. The private pilot student should have the ability to perform the forward slip to a landing as required in the PTS.

Procedure

1.	**Prepare for landing.** Complete before landing checklist. Note wind direction for proper execution.
2.	**Execute forward slip.** Turn final at a higher than normal altitude. Apply carb heat and reduce power to idle. Lower the upwind wing using aileron input. Apply opposite rudder to keep airplane from turning. Adjust pitch to maintain an approach airspeed of 70 KIAS.
3.	**Transition to normal approach.** Forward slip will not be continued below 50ft AGL. Once normal glide path is obtained via two red, two white on the PAPI or red over white on VASI: simultaneously neutralize aileron and rudder input and align aircraft with centerline. “Heels on the floor and back” must be verbalized by the pilot flying on short final or go-around must be initiated.
4.	**Flare and touch down.** Add flaps as necessary and continue landing as normal.

ACS Standards

- Complete the appropriate checklist.
- Make radio calls as appropriate.
- Plan and follow a flightpath to the selected landing area considering altitude, wind, terrain, and obstructions.
- Select the most suitable touchdown point based on wind, landing surface, obstructions, and airplane limitations.
- Position airplane on downwind leg, parallel to landing runway.
- Configure the airplane correctly.
- As necessary, correlate crosswind with direction of forward slip and transition to sideslip before touchdown.
- Touch down at a proper pitch attitude, within 400 feet beyond the specified point, with no side drift, and with the airplanes longitudinal axis aligned with and over the runway center/landing path.
- Maintain ground track aligned with the runway center/landing path.

Go-Around/Rejected/Balked Landing

Description

A go-around is the discontinuance of a landing approach in order to make another attempt to land under more favorable conditions (it is an alternative to any approach or landing). The go-around is a normal maneuver that may at times be used in an emergency situation. It is warranted whenever landing conditions are not satisfactory and the landing should be abandoned or re-setup.

Objective

To understand the importance of a prompt decision and have the ability to quickly and safely configure the airplane and adjust its attitude to accomplish a go-around.

Procedure

1. **Prepare for landing.** Complete before landing checklist.
2. **Execute go-around.** Apply full power, carb heat off, retract flaps to 20°, level wings, and pitch for a V_X climb. After reaching V_X (64 KIAS) and a positive rate of climb, retract remaining flaps in 10° increments. Pitch for V_Y (78 KIAS).
3. **Prepare for landing.** Complete before landing checklist.

ACS Standards

- Complete the appropriate checklist.
- Make radio calls as appropriate.
- Make a timely decision to discontinue the approach to landing.
- Apply takeoff power immediately and transition to climb pitch attitude for V_X or V_Y as appropriate.
    - Private: +10/-5 knots
    - Commercial: +/-5 knots
- Configure the airplane after a positive rate of climb has been verified or in accordance with airplane manufacturer's instructions.
- Maneuver to the side of the runway/landing area when necessary to clear and avoid conflicting traffic.
- Maintain V_Y to a safe maneuvering altitude.
    - Private: +10/-5 knots
    - Commercial: +/-5 knots
- Maintain directional control and proper wind-drift correction throughout the climb.

Touch and Go Operation

Description

A touch and go is the continuance of a takeoff after an approach and landing have been made. Touch and go's are a normal maneuver that may be used to increase efficiency of traffic pattern operation.

Objective

To understand the importance of a prompt decision and have the ability to quickly and safely configure the airplane to accomplish a touch and go.

Procedure

1. **Prepare for landing.** Complete before landing checklist. "Heels on the floor and back" must be verbalized by pilot flying on short final or go-around must be initiated.
2. **Perform specified landing.** Flare and touchdown as normal for specified landing maneuver being performed. If touchdown cannot be made within the first third of the runway, initiate go-around. If aircraft touches down more than a third of the way down the runway inadvertently and there is enough runway remaining to safely stop, touch and go maneuver will be aborted and full stop landing will be made.
3. **Configure aircraft for takeoff.** Maintain directional control while continuing to roll down the runway**.** Configure aircraft for takeoff in the following order: Retract the flaps, increase power to full, and turn carb heat off. Check engine instruments to ensure adequate performance and call out "engine instruments in the green." Verify airspeed indicator needle increasing and call out "airspeed alive." Upon reaching Vr (55 KIAS), rotate and climb out as normal.

ACS Standards

- Reference specified takeoff/landing maneuver executed during touch and go maneuver.

Rectangular Course

Description

Fly and track a rectangular pattern by using crab angles throughout straight segments of the pattern, by planning ahead using different bank angles in order to roll out of turns at the proper position over the ground and maintain a constant altitude throughout the maneuver.

Objective

Develop skills to compensate for effects of wind to fly a uniform traffic pattern by visual reference to the ground.

Procedure

1.	**Complete pre-maneuver checklist.** Clear the area. Make radio calls as appropriate. Maintain 2300 RPM and approximately 90 KIAS. Note wind direction using locally reported weather stations, blowing smoke/dust, or groundspeed using the GPS.
2.	**Select a field.** Select a rectangular field away from a populated area which is bounded on four lines by section lines or roads ½ mile to 1 mile in length. If possible, wind should be parallel to the long sides of the rectangle.
3.	**Enter downwind leg.** Enter the maneuver on a 45° angle to the downwind leg and fly parallel to the field boundary.
4.	**Turn crosswind from downwind.** When abeam the crosswind segment of the field, begin a turn to parallel the crosswind leg. To counteract the effect of wind, plan to continue turn beyond 90° and hold crab angle to track parallel crosswind leg over the ground.
5.	**Turn upwind.** When abeam upwind segment of the field, begin a turn to parallel the upwind leg. Because of crab angle on crosswind leg, the turn to upwind leg should be less than 90°.
6.	**Turn crosswind from upwind.** When abeam the next crosswind segment, begin a turn to the crosswind leg. Plan to turn less than 90° due to the effect of wind and hold crab angle to track parallel crosswind leg over the ground.
7.	**Turn downwind.** When you are abeam the downwind segment of the field, begin turn to downwind leg. Because of crab angle on crosswind leg, the turn to downwind leg should be more than 90°.
8.	**Note.** ACS requires this maneuver to be completed 600-1000 feet AGL.

ACS Standards

- Clear the area.
- Select a suitable ground reference area, line, or point as appropriate.
- Enter a left or right pattern, 600 to 1,000 feet above ground level (AGL) at an appropriate distance from the selected reference area, 45° to the downwind leg
- Apply adequate wind-drift correction during straight and turning flight to maintain a constant ground track around a rectangular reference area, or to maintain a constant radius turn on each side of a selected reference line or point.
- Divide attention between airplane control, traffic avoidance and the ground track while maintaining coordinated flight.
- Maintain altitude ±100 feet; maintain airspeed ±10 knots.

S-Turns

Description

Uniform 180° turns in opposite directions crossing and re-crossing a straight-line reference over the ground.

Objective

Compensate for wind drift during a turn. As groundspeed increases, so should the angle of bank in a turn.

Procedure

1. **Complete pre-maneuver checklist.** Clear the area. Make radio calls as appropriate. Maintain 2300 RPM and approximately 90 KIAS. Note wind direction using locally reported weather stations, blowing smoke/dust, or groundspeed using the GPS.
2. **Select suitable ground reference.** Select a long and prominent straight-line reference on the ground perpendicular to the wind direction away from populated areas (ie; road, fence, or section line).
3. **Enter downwind.** Begin maneuver perpendicular to selected reference line and roll into a turn once crossing it. Downwind entry provides the highest groundspeed in the first 90° of the turn. This will be a relatively steep bank angle.
4. **Track a half circle.** Continue turn and decrease bank angle appropriately as groundspeed decreases past the 90° point to track a symmetrical half-circle.
5. **Cross the reference line upwind.** Cross the reference line after 180° turn is completed with wings level. Begin a turn in the opposite direction as soon as reference line is crossed.
6. **Track another half circle.** Complete turn in opposite direction, noting now that a shallower bank angle at the beginning of turn should increase as groundspeed increases past the 90° point.
7. **Cross the reference line downwind.** Cross the reference line after 180° turn is completed with wings level.
8. **Note.** ACS requires this maneuver to be completed 600-1000 feet AGL.

ACS Standards

- Clear the area.
- Select a suitable ground reference area, line, or point as appropriate.
- Plan the maneuver:
- Enter perpendicular to the selected reference line, 600 to 1,000 feet AGL at an appropriate distance from the selected reference area
- Apply adequate wind-drift correction during straight and turning flight to maintain a constant radius turn on each side of a selected reference line or point.
- Reverse the turn directly over the selected reference line
- Divide attention between airplane control, traffic avoidance and the ground track while maintaining coordinated flight.
- Maintain altitude ±100 feet; maintain airspeed ±10 knots.

Turns Around a Point

Description

Maintaining a constant radius turn around a reference point while remaining at a constant altitude.

Objective

Develop the ability to control the airplane while dividing your attention between flight path and a ground reference point.

Procedure

1. **Complete pre-maneuver checklist.** Clear the area. Make radio calls as appropriate. Maintain 2300 RPM and approximately 90 KIAS. Note wind direction using locally reported weather stations, blowing smoke/dust, or groundspeed using the GPS.
2. **Select a ground reference point.** Select a prominent reference point on the ground away from a populated area.
3. **Enter the turn downwind.** When reference point is abeam airplane on a downwind heading, roll into turn to begin the maneuver. Entering on the downwind should provide the highest groundspeed and initially requires the steepest angle of bank.
4. **Turn crosswind from downwind.** Maintain a constant distance from reference point by gradually reducing the angle of bank and groundspeed decreases due to reduced tailwind.
5. **Turn upwind.** After the first 180° of the turn, bank angle should be at it's shallowest due to slowest groundspeed heading into the wind.
6. **Complete the first turn.** As you turn crosswind from upwind, gradually increase the angle of bank to maintain symmetrical ground track. Complete at least two 360° turns.
7. **Note.** ACS requires this maneuver to be completed 600-1000 feet AGL.

ACS Standards

- Clear the area.
- Select a suitable ground reference area, line, or point as appropriate.
- Enter at an appropriate distance from the reference point, 600 to 1,000 feet AGL at an appropriate distance from the selected reference area
- Apply adequate wind-drift correction during straight and turning flight to maintain a constant ground track around a rectangular reference area, or to maintain a constant radius turn on each side of a selected reference line or point.
- Complete turns in either direction, as specified by the evaluator.
- Divide attention between airplane control, traffic avoidance and the ground track while maintaining coordinated flight.
- Maintain altitude ±100 feet; maintain airspeed ±10 knots.

Steep Turns

Description

Steep turns consist of single or multiple 360° turns, in either direction, using a bank 45° or 50°.

Objective

To teach the student to turn the airplane at steep angles of bank while maintaining altitude and controlling overbanking tendencies, simultaneously dividing attention inside and outside the cockpit.

Procedure

1. **Complete pre-maneuver checklist.** Clear the area. Make radio calls as appropriate. Configure airplane to 2300 RPM at approximately 90 KIAS.
2. **Establish outside visual reference.** Choose and align nose of airplane on a prominent outside visual reference on which to begin and end the maneuver.
3. **Establish the turn.** Note heading and smoothly roll into the steep turn. 45° for private, 50° for commercial.
4. **Maintain the angle of bank and altitude.** Increase ≈100 RPM and ≈2 turns of back trim or as necessary to maintain altitude. Adjust pitch, bank and throttle throughout turn to maintain entry altitude.
5. **Roll out on the entry heading and altitude.** After completing 360° turn, roll wings level while applying forward pressure on yoke to overcome up trim, align with outside visual reference. Complete turn in opposite direction, as specified. When rolling into turn in opposite direction relax forward pressure to maintain altitude during second 360° turn. Consider power and trim adjustment to maintain altitude at completion of maneuver.
6. **Note:** Anticipate rolling out wings level by leading the roll out approximately 20-25° before your desired heading (1/2 the angle of bank).

ACS Standards

- Clear the area.
- Establish the manufacturer's recommended airspeed; or if one is not available, a safe airspeed not to exceed VA.
- Roll into a coordinated 360° steep turn with approximately:
    - Private: 45° bank
    - Commercial: 50° bank
- Perform the Task in the opposite direction, as specified by evaluator.
- Maintain the entry altitude ±100 feet, airspeed ±10 knots, bank ±5°, and roll out on the entry heading ±10°

Maneuvering During Slow Flight

Description

The airplane is maneuvered at minimum controllable airspeed (MCAS) - which is the airspeed in which any further increase in angle of attack, increase in load factor, or reduction in power, would result in a stall warning. Slow flight should be accomplished in straight flight, turns up to 30° of bank, climbs and descents using various configurations.

Objective

To teach the student to recognize changes in airplane flight characteristics and control effectiveness at critically slow airspeeds in various configurations while maintaining positive airplane control at all times. The student will be tested on this maneuver during their FAA checkride.

Procedure

1.	**Complete pre-maneuver checklist.** Clear the area. Make radio calls as appropriate. Maintain 2300 RPM and approximately 90 KIAS. Choose an outside visual reference.
2.	**Decrease airspeed.** Apply carburetor heat, reduce power to 1500 RPM and gradually increase back pressure on yoke to maintain altitude. As airspeed decreases, more right rudder will be needed to maintain coordination. Trim to relieve control pressures.
3.	**Stabilize at minimum controllable airspeed (MCAS).** Once V_{FE} (85 KIAS) is reached, set flaps to 40° in increments. As flaps extend, adjust pitch attitude and increase power to maintain altitude at MCAS of 45 KIAS. Trim to relieve control pressures.
4.	**Preform a climb.** To climb, increase power and turn carburetor heat off as necessary. Consider retracting flaps to 30° if needed. Pitch should be adjusted to maintain MCAS.
5.	**Perform a descent.** To descend, reduce power and adjust pitch to maintain MCAS.
6.	**Perform shallow turns.** Turns should be performed to specified headings as normal but note the soft and "mushy" feel of the controls as less air is moving over the control surfaces. Additional power may be needed to compensate for the reduction in the vertical component of lift.
7.	**Return to cruise flight.** Turn carburetor heat off and apply full power. While maintaining heading and altitude set the flaps to 0° in 10° increments. As the airplane accelerates, pitch attitude should be reduced, and less right rudder should be used to maintain coordinated flight. As cruise airspeed is reached, reduce power and adjust trim to relive control pressure.

ACS Standards

- Clear the area.
- Select an entry altitude that will allow the task to be completed no lower than 1500 feet AGL.
- Establish and maintain an airspeed at which any further increase in angle of attack, increase in load factor, or reduction in power, would result in a stall warning.
- Accomplish coordinated straight-and-level flight, turns, climbs, and descents, with the airplane configured as specified by the evaluator without a stall warning.
- Private: Altitude, ±100 feet; heading, ±10°; airspeed +10/-0 knots; and specified bank angle, ±10°
- Commercial: Altitude, ±50 feet; heading, ±10°; airspeed +5/0 knots; and specified bank angle, ±5°

Minimum Controllable Airspeed

Description

The airplane is maneuvered at minimum controllable airspeed (MCAS) - which is the airspeed in which any further increase in angle of attack, increase in load factor, or reduction in power, would result in a stall. This maneuver should be accomplished in straight flight, turns up to 30° of bank, climbs and descents using various flap configurations.

Objective

To teach the student to recognize changes in airplane flight characteristics, sight picture and control effectiveness at critically slow airspeeds in various configurations while maintaining positive airplane control at all times. The student will NOT be tested on this maneuver during their FAA checkride. For checkride prep see: Maneuvering During Slow Flight.

Procedure

1. **Complete pre-maneuver checklist.** Clear the area. Make radio calls as appropriate. Maintain 2300 RPM and approximately 90 KIAS. Choose an outside visual reference.
2. **Decrease airspeed.** Apply carburetor heat, reduce power to 1500 RPM and gradually increase back pressure on yoke to maintain altitude. As airspeed decreases, more right rudder will be needed to maintain coordination. Trim to relieve control pressures.
3. **Stabilize at minimum controllable airspeed (MCAS).** Once V_{FE} (85 KIAS) is reached, set flaps to 40° in increments (or as desired). As flaps extend, adjust pitch attitude and increase power to maintain altitude at MCAS – with stall horn audible. Trim to relieve control pressures. Note sight picture needed to maintain altitude with stall horn audible.
4. **Preform a climb.** To climb, increase power and turn carburetor heat off as necessary. Consider retracting flaps if needed. Pitch should be adjusted to maintain MCAS– with stall horn audible.
5. **Perform a descent.** To descend, reduce power and adjust pitch to maintain MCAS– with stall horn audible.
6. **Perform shallow turns.** Turns should be performed to specified headings as normal but note the soft and "mushy" feel of the controls as less air is moving over the control surfaces. Additional power may be needed to compensate for the reduction in the vertical component of lift.
7. **Return to cruise flight.** Turn carburetor heat off and apply full power. While maintaining heading and altitude set the flaps to 0° in 10° increments. As the airplane accelerates, pitch attitude should be reduced, and less right rudder should be used to maintain coordinated flight. As cruise airspeed is reached, reduce power and adjust trim to relive control pressure.

ACS Standards

- N/A

Power Off Stalls

Description

The airplane is maneuvered to a critically slow airspeed in straight or turning flight in a power-off (landing) configuration. The angle of attack is then increased until a stall occurs.

Objective

To develop the student's ability to recognize the aerodynamic indications leading to a stall in power- off situations and to make prompt and effective recoveries with a minimum loss of altitude.

Procedure

1.	**Complete pre-maneuver checklist.** Clear the area. Make radio calls as appropriate. Maintain 2300 RPM and approximately 90 KIAS. Select a prominent outside visual reference in reference to nose of aircraft.
2.	**Establish approach speed.** Apply carburetor heat, reduce power to 1500 RPM and gradually apply back pressure on yoke to maintain altitude and reduce airspeed. Upon reaching V_{FE} (85 KIAS) lower full flaps to 30° or 40° in increments and slow to a simulated approach speed of 60 KIAS. Maintain 60 KIAS by pitching down with the yoke.
3.	**Induce stall.** Momentarily maintain a stabilized and coordinated approach. Apply back pressure on yoke to simulate round out. Pull power to idle, pull back on the yoke to induce a flare and maintain coordination by increasing right rudder pressure. Maintain a nose up attitude until stall occurs.
4.	**Recovery.** Simultaneously relax back pressure, add full power, turn carb heat off, and level the wings as necessary. Retract flaps to 20° while maintaining coordination.
5.	**Stop the descent.** Gently increase pitch attitude to accelerate and climb out at V_X or V_Y as specified.
6.	**Establish a climb.** Once a positive rate of climb is achieved, retract remaining flaps in increments.
7.	**Return to cruise flight.** Once desired altitude is reached, lower nose and allow airspeed to increase. Reduce power to 2300 RPM and trim to relieve control pressure.

ACS Standards

- Select an entry altitude that will allow the Task to be completed no lower than 1,500 feet AGL
- Configure the airplane in the approach or landing configuration, as specified by the evaluator, and maintain coordinated flight throughout the maneuver.
- Establish a stabilized descent.
- Transition smoothly from approach or landing attitude to a pitch attitude that will induce a stall.
- Maintain a specified heading, ±10° if in straight flight; maintain a specified angle of bank not to exceed 20°, ±5°, (±10° for private) if in turning flight, until an impending or full stall occurs, as specified by the evaluator.
- Acknowledge the cues at the first indication of a stall (e.g., airplane buffet, stall horn, etc.).
- Recover at the first indication of stall (commercial) or after full stall has occurred (private), as specified
- Configure the airplane as recommended by the manufacturer and accelerate to V_X or V_Y.
- Return to the altitude, heading, and airspeed specified by the evaluator.

Power-On Stalls

Description

The airplane is maneuvered to a critically slow airspeed in straight or turning flight in a power-on configuration. The angle of attack is then increased until a stall occurs.

Objective

To develop the student's ability to recognize the aerodynamic indications leading to a stall in power- on situations and to make prompt and effective recoveries with a minimum loss of altitude.

Procedure

1.	**Complete pre-maneuver checklist.** Clear the area. Make radio calls as appropriate. Maintain 2300 RPM and approximately 90 KIAS. Select a prominent outside visual reference in reference to nose of aircraft.
2.	**Slow to takeoff speed**. Apply carburetor heat and reduce power to 1500 PRM. Increase back pressure on yoke to maintain altitude and slow to V_R (55 KIAS).
3.	**Induce stall.** As you reach V_R, simultaneously set takeoff (full) power and smoothly and continuously apply back pressure on yok and maintain takeoff pitch attitude until stall occurs. Maintain coordination with the rudders.
4.	**Recovery.** Upon inducing the stall, immediately release back pressure.
5.	**Stop the descent.** Gently pull back on the yoke to stop descent and maintain nose attitude level with the horizon to accelerate to V_X or V_Y.
6.	**Establish a climb.** Upon reaching V_X or V_Y establish a positive rate of climb.
7.	**Return to cruise flight.** Once desired altitude is reached, lower nose and allow airspeed to increase. Reduce power to 2300 RPM and trim to relieve control pressure.

ACS Standards

- Clear the area.
- Select an entry altitude that will allow the Task to be completed no lower than 1,500 feet AGL
- Establish the takeoff, departure, or cruise configuration, as specified by the evaluator, and maintain coordinated flight throughout the maneuver.
- Set power (as assigned by the evaluator) to no less than 65 percent available power.
- Transition smoothly from the takeoff or departure attitude to the pitch attitude that will induce a stall.
- Maintain a specified heading, ±10° if in straight flight; maintain a specified angle of bank not to exceed 20°, ±10° if in turning flight, while inducing the stall.
- Acknowledge cues of the impending stall and then recover promptly after a full stall occurs (private).
- Recover at the first indication of a stall or after a full stall has occurred, as specified by the evaluator (commercial).
- Execute a stall recovery in accordance with procedures set forth in the POH/AFM.
- Configure the airplane as recommended by the manufacturer and accelerate to V_X or V_Y.
- Return to the altitude, heading, and airspeed specified by the evaluator.

Accelerated Stalls

Description

Demonstrating a potential stall above published indicated stall speed due to increased load factor.

Objective

Recognize and recover from stalls that can happen at any airspeed at any altitude in any configuration.

Procedure

1. **Complete pre-maneuver checklist.** Clear the area. Make radio calls as appropriate. Maintain 2300 RPM and approximately 90 KIAS at least 3000 AGL.
2. **Maneuver entry.** Carb heat on. Power to 1500. Maintain altitude to slow to 70 KIAS**.**
3. **Perform.** Pull power to idle. Bank 45° to either direction and maintain coordination with appropriate rudder input. Continually apply smooth and aggressive back pressure on yoke to pull and maintain nose attitude across the horizon until first indication of stall is recognized.
4. **Recovery.** Simultaneously relax back pressure, add full power, turn carb heat off and roll wings level while maintaining coordination. Accelerate and climb out at V_X or V_Y as specified.

ACS Standards

- Clear the area.
- Select an entry altitude that will allow the task to be completed no lower than 3,000 feet AGL.
- Establish the configuration as specified by the evaluator.
- Set power appropriate for the configuration, that the airspeed does not exceed the maneuvering speed (V_A) or any other applicable POH/AFM limitation.
- Establish and maintain a coordinated turn in a 45° bank, increasing elevator back pressure smoothly and firmly until an impending stall is reached.
- Acknowledge the cue(s) and recover promptly at the first indication of an impending stall. (e.g., aircraft buffet, stall horn, etc.).
- Execute a stall recovery in accordance with procedures set forth in the POH/AFM.
- Configure the airplane as recommended by the manufacturer and accelerate to V_X or V_Y.
- Return to the altitude, heading, and airspeed specified by the evaluator.

Cross Control Stall

Description

Demonstrate the transition from cruise flight to critically low airspeed in a cross controlled configuration, ie; base-to-final turn.

Objective

Emphasize the importance of using coordinated control pressures whenever making turns, especially when turning base-to-final.

Procedure

1. **Complete pre-maneuver checklist.** Clear the area. Make radio calls as appropriate. Maintain 2300 RPM and approximately 90 KIAS.
2. **Establish approach speed.** Apply carburetor heat, reduce power to 1500 RPM and gradually apply back pressure on yoke to maintain altitude and reduce airspeed. Upon reaching V_{FE} (85 KIAS) lower full flaps to 30° or 40° in increments and slow to a simulated approach speed of 60 KIAS. Maintain 60 KIAS by pitching down with the yoke.
3. **Simulate base-to-final turn.** Turn 25º-30º in either direction.
4. **Input cross control configuration.** Simultaneously: Apply excessive rudder pressure in the direction of the turn, use opposite aileron to prevent overbanking, and continually increase back pressure until first indication of stall is reached.
5. **Recovery.** Simultaneously relax back pressure, add full power, turn carb heat off and roll wings level while maintaining coordination. Accelerate and climb out at V_X or V_Y as specified.

ACS Standards

- The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing: secondary stalls, accelerated stalls, cross-control stalls.

Secondary Stall

Description

Secondary Stalls are caused by attempting to rush the completion of a stall recovery before the airplane has regained adequate flying speed or before sufficiently reducing the angle of attack.

Objective

Demonstrate the effects of improper control usage on stall recovery.

Procedure

1. **Complete pre-maneuver checklist.** Clear the area. Make radio calls as appropriate. Maintain 2300 RPM and approximately 90 KIAS.
2. **Perform a stall.** Perform a power-off or power-on stall to a full break.
3. **Improper recovery.** Initiate normal stall recovery by simultaneously relaxing back pressure, adding full power, turning carb heat off and holding wings level while maintaining coordination.
4. **Induce secondary stall.** Immediately increase back pressure to increase pitch attitude and angle of attack to induce a secondary stall to a full break.
5. **Recovery.** Simultaneously relax back pressure, add full power, turn carb heat off and hold wings level while maintaining coordination. Accelerate and climb out at V_X or V_Y as specified.

ACS Standards

- The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing: secondary stalls, accelerated stalls, cross-control stalls.

Engine Failure in Flight

Description

Simulated engine failure occurs, and the airplane is troubleshooted and maneuvered to the best applicable landing site.

Objective

To develop the skill and proficiency necessary to accomplish a power-off emergency approach and landing at the best available site.

Procedure

1. **Recognize.**
2. **Airspeed.** Establish best glide speed (65 KIAS) using back pressure on the yoke and maintain altitude as long as possible. Trim to relieve control pressures.
3. **Best field.** Choose a suitable landing site within glide range considering wind, obstructions, and field conditions.
4. **Checklist.** A flow check should be completed to troubleshoot reason for engine failure.
    - Fuel selector…… both
    - Mixture…… rich
    - Throttle…… cycle, then idle
    - Carb heat…… on
    - Ignition…… cycle, then both
    - Primer…… in and locked
    - If engine does not restart and altitude permits, complete engine failure in flight checklist
5. **Declare.** Notify ATC on the appropriate frequency (121.5). Set transponder to squawk 7700.
6. **Exit strategy.** Complete emergency landing without power checklist (time permitting).

ACS Standards

- Establish and maintain the recommended best glide airspeed, ±10 knots.
- Configure the airplane in accordance with POH/AFM and existing circumstances.
- Suitable landing area considering altitude, wind, terrain, obstructions, and glide distance.
- Plan and follow a flight path to the selected landing area.
- Prepare for landing as specified by the evaluator.
- Complete the appropriate checklist.

Emergency Descent

Description

The aircraft enters a high rate descent while being maneuvered towards the best available landing site.

Objective

To develop the skill and proficiency necessary to accomplish an off-field landing as soon as practical if an emergency situation requires it.

Procedure

1. **Configure the airplane.** Apply carb heat, reduce power to idle and pitch down to ≈120 KIAS.
2. **Establish a descending turn.** Bank 30° to 45° in order to establish a positive load on the airplane, scan for traffic, look for possible landing sites and increase the rate of descent.
3. **Return to straight and level flight.** Roll wings level and gradually raise the nose approximately 100 feet prior to desired level off altitude.
4. **Return to cruise flight.** Adjust power and mixture settings. Complete appropriate checklist and trim to relieve control pressures.
5. **Prepare for landing.** If applicable, head towards appropriate landing site and configure the airplane for landing using the appropriate checklist.

ACS Standards

- Clear the area.
- Establish and maintain the appropriate airspeed and configuration appropriate to the scenario as specified by the evaluator and as covered in the POH/AFM for the emergency descent.
- Maintain orientation, divide attention appropriately, and plan and execute a smooth recovery.
- Use bank angle between 30° and 45° to maintain positive load factors during the descent.
- Maintain appropriate airspeed +0/-10 knots, and level off at the specified altitude +/-100 feet.
- Complete the appropriate checklist.

Engine Failure After Takeoff

Description

Simulated engine failure occurs, and the airplane is troubleshooted and maneuvered to the best applicable landing site.

Objective

To develop the skill and proficiency necessary to accomplish a power-off emergency approach and landing at the best available site.

Procedure

1.	**Complete pre-maneuver checklist.** Clear the area. Make radio calls as appropriate. Maintain 2300 RPM and approximately 90 KIAS at least 2500 AGL and note altitude. Pick a prominent ground reference point to simulate a runway.
2.	**Slow to takeoff speed**. Apply carburetor heat and reduce power to 1500 PRM. Increase back pressure on yoke to maintain altitude and slow to V_R (55 KIAS).
3.	**Establish a climb.** Upon reach V_R, apply full power and pitch nose up simulating takeoff.
4.	**Simulate engine failure.** Apply carb heat and reduce power to idle.
5.	**Establish best glide.** Pitch and trim for best glide speed (65 KIAS). Begin 180° - 210° turn using 45° of bank to line up on ground reference point.
6.	**Assess.** Note altitude lost during turn.

ACS Standards

- Describe the appropriate action for simulated emergencies specified by the evaluator.
- Complete the appropriate checklist

Power-Off 180 Accuracy Approach and Landing

Description

An approach and landing that is accomplished without the use of engine power to a specific point on the runway.

Objective

To instill in the pilot the judgment and procedures necessary for accurately flying the airplane, without power, to a safe landing.

Procedure

1. **Simulate engine failure.** Fly a normal traffic pattern. Abeam a specified aiming point on the runway, apply carb heat and pull power to idle.
2. **Establish a glide.** Maintain altitude while slowing to best glide speed (65 KIAS) and trim to relieve control pressures.
3. **Turn base.** Use judgement to assess an appropriate distance from runway to start base turn. Plan accordingly for varying wind conditions. Flaps should not be added until landing on intended aiming point is assured.
4. **Turn Final.** Use judgement to assess an appropriate distance from runway to start final turn. Plan accordingly for varying wind conditions. Flaps should not be added until landing on intended aiming point is assured. "Heels on the floor and back" must be verbalized by the pilot flying on short final or go-around must be initiated.
5. **Touchdown.** Maintain 65 KIAS until short final. Transition to 60 KIAS and touchdown as normal.

*Note: A go around during this maneuver will result in a failed maneuver on the checkride. For safety always go around if conditions warrant it.

ACS Standards

- Complete the appropriate checklist.
- Make radio calls as appropriate.
- Plan and follow a flightpath to the selected landing area considering altitude, wind, terrain, and obstructions.
- Select the most suitable touchdown point based on wind, landing surface, obstructions, and aircraft limitations.
- Position airplane on downwind leg, parallel to landing runway.Correctly configure the airplane.
- As necessary, correlate crosswind with direction of forward slip and transition to side slip for landing.
- Touch down at a proper pitch attitude, within 200 feet beyond or on the specified point with no side drift and with the airplane's longitudinal axis aligned with and over the runway centerline or landing path, as applicable.

Steep Spiral

Description

The aircraft is maneuvered around a point on the ground in a manner that keeps the aircraft's ground track in a circle, while in a power-off glide.

Objective

To improve pilot techniques for power-off turns, wind drift control, planning, orientation, and division of attention.

Procedure

1. **Complete pre-maneuver checklist.** Clear the area. Make radio calls as appropriate. Maintain 2300 RPM and approximately 90 KIAS at an altitude that will allow at least three – 360° turns to be completed no lower than 1000 AGL. Pick a prominent ground reference point to simulate a runway.
2. **Simulate engine failure.** Enter maneuver downwind to ground reference point almost directly above it. Apply carb heat and pull power to idle.
3. **Emergency procedure.** Complete ABCDE engine failure checklist. Best place to land should be ground reference point chosen at prior to maneuver start.
4. **Begin gliding spiral.** At best glide speed (65 KIAS), maneuver at a constant radius around ground reference point. Vary the bank angle as necessary as groundspeed changes (do not exceed 60°).
5. **Clear the engine.** Upon completing each 360° turn, smoothly and briefly apply full power in the upwind turn to verify engine is still operating.
6. **Complete three 360° turns.** Upon completing the third turn, rollout on entry heading and return to cruise flight.

ACS Standards

- Clear the area.
- Select an altitude sufficient to continue through a series of at least three 360° turns.
- Establish and maintain a steep spiral, not to exceed 60° angle of bank, to maintain a constant radius about a suitable ground reference point.
- Apply 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, and the ground track, while maintaining coordinated flight.
- Maintain the specified airspeed, ±10 knots and roll out toward an object or specified heading, ±10°, and complete the maneuver no lower than 1,500’ AGL.

Eights on Pylons

Description

The airplane is maneuvered between and then around two prominent reference points (pylons) in the form of a figure 8. During the turn portion the pylon is kept at the same position relative to the airplane's lateral axis by adjusting both altitude and bank angle.

Objective

To develop the student's ability to maneuver the airplane accurately while dividing his/her attention between the flight path and the selected points on the ground.

Procedure

PIVOTAL ALT	
GS	**AGL**
85	639
90	716
95	799
100	885
105	976
110	1071

Formula: $\frac{GS^2}{11.3}$

1. **Complete pre-maneuver checklist.** Clear the area. Make radio calls as appropriate. Maintain 2300 RPM and approximately 90 KIAS.
2. **Set up for maneuver.** Note wind direction. Select suitable pylons that are at similar elevations, not over a congested area, and ½ - ¾ miles apart.
3. **Maneuver entry.** Enter the maneuver downwind at a 45° angle splitting the two pylons. Determine correct pivotal altitude on entry based on groundspeed.
4. **Maintain pivotal altitude.** Once wingtip reference is abeam pylon, establish bank of no more than 40°. Maintain sight picture by adjusting pivotal altitude based on groundspeed. Pitch foreword if pylon moves towards the nose, and pitch back if pylon moves towards the tail.
5. **Repeat around second pylon.** Begin rollout to allow airplane to proceed diagonally between pylons at 45° angle. Maintain line of sight reference around second pylon by adjusting pivotal altitude based on ground speed.
6. **Exit Maneuver.** Rollout once crossing between the two pylons on the same heading maneuver was started. Return to cruise flight.

ACS Standards

- Determine the approximate pivotal altitude.
- Select suitable pylons that will permit straight-and-level flight between the pylons.
- Correctly enter the maneuver at the appropriate altitude and airspeed.
- Establish the correct bank angle for the conditions, not to exceed 40°.
- Apply corrections so that the line-of-sight reference line remains on the pylon.
- Divide attention
- Maintain pylon position using appropriate pivotal altitude, avoiding slips and skids.

Lazy Eights

Description

Two coordinated 180º turns are completed in opposite directions. Each turn includes a climb and a descent in a symmetrical pattern; the nose of the airplane scribing a horizontal eight on the horizon.

Objective

To develop the student's feel for varying control forces from high through low airspeeds, and ability to accurately maneuver the airplane while demonstrating good planning and orientation.

Procedure

1.	**Complete pre-maneuver checklist.** Clear the area. Make radio calls as appropriate. Maintain 2300 RPM and approximately 90 KIAS.
2.	**Select outside visual references.** Choose a 90° reference point off one wingtip.
3.	**Begin maneuver.** Without adjusting power, begin a gradual climbing turn towards the reference point.
4.	**45° point.** Once the nose of the aircraft is halfway to the reference point, the aircraft should be at 15° pitch and 15° of bank. Continue gradual bank and begin to relax back pressure allowing the nose to gradually fall to the horizon.
5.	**90° point.** Once the nose of the aircraft is on the reference point, the aircraft should be at 0° pitch, 30° bank, minimum airspeed and maximum altitude.
6.	**135° point.** Continue to relax back pressure and begin to rollout bank so when the nose of the aircraft is 135° from the starting heading, it is at 15° pitch down, and 15° bank. Begin to level the pitch attitude and bank.
7.	**180° point.** The opposite wing should rollout on the reference point in level flight, at the same airspeed and altitude as on entry.
8.	**Repeat in opposite direction.** Complete maneuver on same heading and at same entry altitude.

ACS Standards

- Clear the area.
- Select an altitude that will allow the maneuver to be performed no lower than 1,500 feet AGL.
- Establish the recommended entry configuration, power, and airspeed.
- Maintain coordinated flight throughout the maneuver.
- Complete the maneuver in accordance with the following:
    - Approximately 30° bank at the steepest point
    - Constant change of pitch and roll rate and airspeed
    - Altitude at 180°point, ±100 feet from entry altitude
    - Airspeed at the 180° point, ±10 knots from entry airspeed
    - Heading at the 180° point, ±10°
- Continue the maneuver through the number of symmetrical loops specified, then resume straight-and-level flight.

Chandelle

Description
A coordinated 180° maximum performance climbing turn.

Objective
To develop the student's control techniques at varying airspeeds and attitudes while remaining oriented and coordinated.

Procedure

1.	**Complete pre-maneuver checklist.** Clear the area. Make radio calls as appropriate. Maintain 2300 RPM and approximately 90 KIAS.
2.	**Select outside visual references.** Choose a 90° reference point off one wingtip.
3.	**Roll.** Roll into and do not exceed a 30° bank towards 90° reference point.
4.	**Power and climb.** Smoothly apply full power while simultaneously applying gradual back pressure to enter a coordinated climbing turn.
5.	**First 90°.** Bank angle should remain constant at 30° and pitch attitude should be slowly increasing for the first 90° of the climbing turn until the nose is aligned with the outside reference point.
6.	**Second 90°.** After the nose of the aircraft passes the outside reference point, slowly begin rolling out the bank and maintain a constant pitch attitude.
7.	**Complete 180° turn.** Complete the climbing 180° turn just above stall speed (bottom of green arc on airspeed indicator) and momentarily maintain that airspeed.
8.	**Return to cruise flight.** Maintain altitude while slowly lowering the nose to increase airspeed and return to cruise flight.

ACS Standards

- Clear the area.
- Select an altitude that will allow the maneuver to be performed no lower than 1,500 feet above ground level (AGL).
- Establish the appropriate entry configuration, power, and airspeed.
- Establish the angle of bank at approximately 30°.
- Simultaneously apply power and pitch to maintain a smooth, coordinated climbing turn, in either direction, to the 90° point, with a constant bank and continuously decreasing airspeed.
- Begin a coordinated constant rate rollout from the 90° point to the 180° point maintaining power and a constant pitch attitude.
- Complete rollout at the 180° point, ±10° just above a stall airspeed, and maintaining that airspeed momentarily avoiding a stall.
- Resume a straight-and-level flight with minimum loss of altitude.

Recovery from Unusual Attitudes

Description

The airplane is put into an abnormal climbing, descending, or steeply banked attitude with loss of outside visual reference.

Objective

To help recognize and recover from spatial disorientation, wake turbulence, or other disorienting events in flight.

Nose High Procedure

1. **Recognize.**
   - Airspeed decreasing
   - Altitude increasing
   - Positive rate on VSI
2. **Recover.** Apply full power and forward elevator pressure to lower the nose. Use coordinated rudder and aileron input to level the wings.
3. **Crosscheck.** Continue to scan instruments to verify normal attitude.
4. **Return to cruise flight.** Decrease power to a normal cruise setting and trim to relieve control pressures.

Nose Low Procedure

1. **Recognize.**
   - Airspeed Increasing
   - Altitude decreasing
   - Negative rate on VSI
2. **Recover.** Reduce power to idle and level the wings by using coordinated rudder and aileron pressure. Apply smooth back elevator pressure to raise the nose until the altimeter stops moving.
3. **Crosscheck.** Continue to scan instruments to verify normal attitude.
4. **Return to cruise flight.** Increase power to a normal cruise setting and trim to relieve control pressures.

ACS Standards

- Recognize unusual flight attitudes; perform the correct, coordinated and smooth flight control application to resolve unusual pitch and bank attitudes while staying within the airplane's limitations d flight parameters.

Diversion

Description

Diversion procedures are intended to facilitate changing your destination while enroute in the event of encountering unexpected weather that calls for a diversion from your original route.

Objective

To be able to recognize when you are lost and select an appropriate course of action. This normally entails identifying your position using prominent landmarks, radio navigation or contacting ATC for assistance or a combination of these techniques. If weather is deteriorating or fuel exhaustion is imminent it may be necessary to plan a precautionary landing.

Procedure

1.	**Turn towards selected airport.** Verify approximate heading to fly using all available resources and begin a turn in that direction.
2.	**Distance.** Using all available resources, approximate the distance between your current location, and selected diversion airport.
3.	**Time.** Using all available resources, based on distance from diversion airport, approximate the flight time between your current location and selected airport.
4.	**Time.** Using all available resources, based on flight time to diversion airport, approximate the fuel required to make it to selected diversion airport.

ACS Standards

- Select a suitable destination and route for diversion.
- Make a reasonable estimate of heading, groundspeed, arrival time, and fuel consumption to the divert airport.
- Maintain the appropriate altitude +/-200 feet and heading +/-15°.
- Update/interpret weather in flight.
- Utilize flight deck displays of digital weather and aeronautical information as applicable.

Lost Procedures

Description

Objective

To be able to recognize when you are lost and select an appropriate course of action. This normally entails identifying your position using prominent landmarks, radio navigation or contacting ATC for assistance or a combination of these techniques. If weather is deteriorating or fuel exhaustion is imminent it may be necessary to plan a precautionary landing.

Procedure

1. **Climb.** Initiate a climb to aid in identifying prominent landmarks. Be mindful of traffic and weather conditions.
2. **Circle.** Circle over current position as you climb to prevent getting father away from last known position.
3. **Crosscheck.** Using navigation instruments, plot azimuth from two VOR facilities to triangulate your approximate position. Crosscheck with GPS.
4. **Communicate.** Request assistance from nearby traffic, ATC or FSS.
5. **Confess.** Notify appropriate agency or personnel that you are lost.
6. **Comply.** Adhere to instructions given by ATC or FSS.

ACS Standards

- Use an appropriate method to determine position.
- Maintain an appropriate heading and climb as necessary.
- Identify prominent landmarks.
- Use navigation systems/facilities or contact ATC for assistance.

ACS Standards Table

PRIVATE COMMERCIAL	ALTITUDE	AIRSPEED	HEADING	BANK	DISTANCE	MIN ALTITUDE
NORMAL TAKEOFF		+10/-5				
NORMAL LANDING		+10/-5			400	
SOFT FIELD TAKEOFF		+10/-5				
SOFT FIELD LANDING		+10/-5				
SHORT FIELD TAKEOFF		+10/-5				
SHORT FIELD LANDING		+10/-5			200	
GO-AROUND		+10/-5				
STEEP TURNS	+/-100	+/-10	+/-10	+/-5 (45)		
	+/-100	+/-10	+/-10	+/-5 (50)		
RECTANGULAR COURSE	+/-100	+/-10				600-1000 AGL
S-TURNS	+/-100	+/-10				600-1000 AGL
TURNS AROUND A POINT	+/-100	+/-10				600-1000 AGL
SLOW FLIGHT	+/-100	+10/-0	+/-10	+/-10		1500 AGL
	+/50	+5/-0	+/-10	+/-5		1500 AGL
POWER OFF STALL			+/-10	< 20 +/-10		1500 AGL
			+/-10	< 20 +/-5		1500 AGL
POWER ON STALL			+/-10	< 20 +/-10		1500 AGL
			+/-10	< 20 +/-5		1500 AGL
LEVEL/CLIMBS/DESCENTS	+/-200	+/-10	+/-20			
TURNS	+/-200	+/-10	+/-10			
NORMAL TAKEOFF		+/-5				
NORMAL LANDING		+/-5			200	***PIVOTAL ALT***
SOFT FIELD TAKEOFF		+/-5				85: 639
SOFT FIELD LANDING		+/-5				90: 716
SHORT FIELD TAKEOFF		+/-5				95: 799
SHORT FIELD LANDING		+/-5			100	100: 885
POWER OFF 180					200	105: 976
GO-AROUND		+/-5				110: 1071
STEEP SPIRAL		+/-10	+/-10	< 60		1500 AGL
CHANDELLE		+STALL	+/-10	30		1500 AGL
LAZY 8	+/-100	+/-10	+/-10	< 30		
8'S ON PYLONS				< 40		
ACCELERATED STALL				45		3000 AGL
EMERGENCY DESCENT	+/-100	+0/-10		30-45		
EMERGENCY APPROACH		+/-10				

Fly by Numbers Guide

Condition	RPM	Attitude	Flaps	KIAS	VSI	Trim
Climb (10,000)	Max	3º-5º	Up	78 (68)	XXX ?	As Req'd
Cruise Climb	Max	1º-3º	Up	80-85	XXX ?	As Req'd
Cruise	2300	0º	Up		0	0-2 Down
Descent			Up		XXX ?	
Approach	1700		Up	90	500 ?	
MDA Level					0	
Missed Approach			Up		XXX ?	