

Piper PA-44-180 Seminole **Standardization Manual**

This manual is to be utilized in conjunction with the manufacturers approved POH/AFM and the Airplane Flying Handbook (FAA-H-8083-3A). This manual should be used as a reference for approximate power settings and Leading Edge Aviation standard procedures. Adjustments in suggested power settings may be required to attain desired speeds. This manual should be used for training purposes only and final authority will be with the Pilot in Command.

Normal Takeoff and Climb

Objective: To develop the students ability to safely take the aircraft off the ground and depart to take off area during normal conditions.

Procedure:

1. Visually note wind direction and speed.
2. Taxi onto the runway, aligning the nose wheel with the centerline.
3. Apply full throttle.
4. Maintain directional control with rudder pedals.
5. Announce "Engine instruments in the green, airspeed is alive, _____ RPM/"MP."
6. Rotate at 75 KIAS.
7. Pitch for 88 KIAS with reference to the natural horizon.
8. Maintain an initial climb speed of 88 KIAS.
9. Retract landing gear at positive rate of climb.*
 - a. A verbal call out will be made when the landing gear pump has turned off.
10. To depart the pattern, continue straight out, or exit with a 45° turn in the direction of the traffic pattern.
11. At 1000' AGL, complete the climb checklist.

**Note: The hand used to retract the landing gear should be placed promptly back on the throttles after the landing gear switch has been placed in the retract position.*

Crosswind Takeoff and Climb

Objective: To develop the students ability to safely take the aircraft off the ground and depart the takeoff area during crosswind conditions.

Procedure:

1. Visually note wind direction and speed.
2. Taxi onto the runway, aligning the aircraft with the centerline.
3. Apply FULL ailerons into the wind with the elevator placed in the neutral position.
4. Apply full throttle.
5. Maintain directional control with the rudder pedals.
6. Announce "Engine instruments in the green, airspeed is alive, _____ RPM/"MP."
7. Adjust the ailerons to keep wings level during the ground role.
8. Rotate firmly at 75 KIAS.*
9. Establish a wind correction angle in order to maintain a ground track which is aligned with the runway centerline.
10. Pitch for 88 KIAS with reference to the natural horizon.
11. Maintain an initial climb speed of 88 KIAS.
12. Retract landing gear at positive rate of climb.**
 - a. A verbal call out will be made when the landing gear pump has turned off.
12. To depart the pattern, continue straight out, or exit with a 45° turn in the direction of the traffic pattern.
13. At 1000' AGL, complete the climb checklist.

**Note: The aircraft should be positively rotated to preclude the possibility of skidding the main gear tires as might be encountered during a gradual rotation. Make a coordinated turn to maintain ground track.*

***Note: The hand used to retract the landing gear should be placed promptly back on the throttles after the landing gear switch has been placed in the retract position.*

Short Field Takeoff and Climb

Objective: To teach the student to obtain maximum performance during the takeoff phase so as to minimize runway length required for takeoff.

Procedure:

1. Visually note wind direction and speed.
2. Taxi onto the runway, aligning the nose wheel with the centerline.
3. Hold the brakes firmly to prevent the aircraft from rolling.
4. Smoothly apply full throttle.
5. Announce "Engine instruments in the green, _____ RPM/"MP."
6. Smoothly release the brakes and announce "Airspeed is alive."
7. Maintain directional control with rudder pedals.
8. Lift off at 70 KIAS*.
9. Pitch up to maintain 75 KIAS* until obstacles are cleared.
10. Retract landing gear once safely airborne and positive rate of climb is assured.**
 - b. A verbal call out will be made when the landing gear pump has turned off.
11. After obstacle clearance is assured, pitch for an attitude which will allow the aircraft to accelerate to either V_x or V_y as appropriate.
12. To depart the pattern, continue straight out, or exit with a 45° turn in the direction of the traffic pattern.
13. At 1000' AGL, complete the climb checklist.

**Note: Lift off speed and climb speed are dependent on weight. Consult the performance section of the POH.*

***Note: The hand used to retract the landing gear should be placed promptly back on the throttles after the landing gear switch has been placed in the retract position.*

Note: Flaps will be retracted for this maneuver.

Traffic Pattern Operations

Objective: To develop the ability to conduct safe and efficient arrival and departure procedures that uncontrolled airports.

Procedure:

1. Complete the Descent Checklist if appropriate.
2. Determine the active runway and estimate the crosswind component.
3. Pattern altitude must be established at least 2 miles prior to entering the downwind.
4. Slow the aircraft to 110 KIAS (approximately 17" MP and 2500 RPM).
5. Establish a 45° entry to the midpoint of the downwind leg.
6. Adjust speed and course as appropriate to maintain proper spacing from aircraft already established in the traffic pattern.
7. Turn downwind at approximately 1/2 to 1 mile from the active runway.
8. Prior to midfield, extend the landing gear and perform the Before Landing checklist.
 - a. The hand used to extend the gear should remain on the landing gear switch until the pump has shut off and all three landing gear lights are illuminated.
 - b. An increase in MP may be required to maintain 110 KIAS with the landing gear extended.
9. When abeam the point of intended landing, reduce the throttle to 15" MP, set flaps to 10°, and adjust the pitch attitude to maintain approximately a 500 FPM descent rate.
10. When the touchdown point is positioned 45° behind the wing of the aircraft, turn onto the base leg and lower the flaps to 25° while maintaining approximately a 500 FPM descent rate and approximately 90 KIAS.
11. Turn onto the final leg with the airplane aligned on the runway centerline and lower the flaps as appropriate.
12. Refer to the appropriate landing procedure.

Flow Check

Objective: To ensure that the aircraft is in a condition appropriate for either the subsequent maneuver or cruise.

Procedure:

1. Set the fuel selectors to ON.
2. Set the cowl flaps as required to ensure proper engine temperatures during the maneuver.
 - a. If the CHT is approaching 435° (top of the green arc), open the cowl flaps.
 - b. If the maneuver to be performed requires low or idle power, the cowl flaps should be closed prior to throttle closure.
3. Ensure that the primers are in the locked position.
4. Verify that the carb heat levers are in the appropriate position.
5. Set power to the appropriate setting.
6. Adjust the mixtures via the EGT gauges to 125° rich of peak.
 - a. This should be done every time an altitude change of 2,000' or more has been accomplished.
7. Extend/retract the landing gear as appropriate.
8. Extend/retract the flaps as appropriate.
9. Turn on/off the electric fuel pumps as appropriate.
10. Mags and switches as appropriate.

Clearing Procedure

Objective: To teach the students to exercise conscientious and continuous surveillance of the airspace in which the airplane is being operated and configure the aircraft for maneuvering flight.

Procedure:

First 90° clearing turn:

1. Perform the flow check.
2. Visually scan the area to the left and right of the aircraft.
3. Pick a visual landmark off the wing tip in the direction of turn to roll out on.
4. Lower the wings and direction of turn to clear for traffic and enter a 30° bank.
5. Continuously scan the area ABOVE, BELOW, and AHEAD of the flight path.
6. After 90° of turn is completed, roll out wings level on your selected landmark.

Second 90° clearing turn:

7. Visually scan the area to the left and right of the aircraft.
8. Pick a visual landmark off the wing tip in the direction of turn to roll out on.
9. Enter a 30° bank in the same or opposite direction as the first 90° of heading change.
10. Continuously scan the area ABOVE, BELOW, and AHEAD of the flightpath.
11. After 90° of turn is completed, roll out wings level on your selected landmark.

Maneuvering During Slow Flight

Objective: To teach the student to recognize changes in aircraft flight characteristics and control effectiveness at critically slow airspeeds in various configurations.

Procedure:

1. Perform this maneuver so that the recovery takes place at or above 3000' AGL.
2. Complete the flow check and CRAGS.
 - a. The propeller control should be placed full forward in the high RPM position.
3. Reduce power to 12-13" MP.
4. Extend the gear at or below 140 KIAS for a landing configuration.
5. Pick a visual reference point to assist in maintaining heading.
6. Below 111 KIAS, extend flaps incrementally.
7. When the airspeed is approximately 10 KIAS above the target airspeed, add power.

Configuration	Target Speed	Power Setting*
Cruise	57 KIAS	18" MP
Landing	55 KIAS	20" MP

**Power settings may vary based upon aircraft loading and density altitude.*

8. Maintain target airspeed +5 KIAS, -0 KIAS.
9. Turns, climbs, and descents should be practiced.
10. To recover:
 - a. Smoothly apply full power.
 - b. Adjust the pitch and trim accordingly to maintain altitude.
 - c. Retract the flaps to 25°.
 - d. Retract the landing gear (if extended).
 - e. Retract the remaining flaps gradually between V_x and V_y .
11. After the maneuver is complete, trim the aircraft for cruise and complete the flow check.

Warning: In the event of loss of directional control, close both throttles immediately and perform the spin recovery procedure.

Steep Turns

Objective: To develop smoothness, coordination, orientation, division of attention, and control techniques while executed high-performance turns.

Procedure:

1. Perform this maneuver so that the recovery takes place at or above 3000' AGL.
2. Complete the flow check and CRAGS.
3. Pick a visual reference point to assist in maintaining heading.
4. Perform this maneuver at or below maneuvering speed.
 - a. 17" MP and 2500 RPM should yield approximately 110 KIAS.
5. Note the pitch attitude for level flight.
6. Roll into the specified bank angle (Private 45°, Commercial 50°).
7. As the aircraft rolls through 30° of bank:
 - a. Add power to maintain airspeed (2-3" MP).
 - b. Increase back pressure to maintain altitude.
 - c. Note the position of the nose relative to the horizon.
8. Trim should be used to relieve back pressure.
9. Begin rolling out of your turn approximately 1/2 the bank angle before your reference point.
10. As the aircraft rolls through 30° of bank:
 - a. Reduce the power to maintain airspeed (17" MP and 2500 RPM)
 - b. Decrease back pressure to maintain altitude.
11. Repeat steps 6-10 for the turn in the opposite direction*.
12. After the maneuver is complete, trim the aircraft for cruise and complete the flow check.

**Note: Private Pilots do not need to connect the first and second turn. The first turn may be made after which, the student may take time to set up for the second turn. Commercial pilots must complete the second turn immediately after the first.*

Power-Off Stall

Objective: To teach the student to recognize the indications of an imminent or full stall during power off situations and to make prompt, positive, and effective recoveries with a minimum loss of altitude.

Procedure:

1. Perform this maneuver so that the recovery is completed at or above 3000' AGL.
2. Complete the flow check and CRAGS.
 - a. The propeller control should be placed full forward in the high RPM position.
3. Pick a visual reference point to assist in maintaining heading.
4. Reduce power to 12-13" MP.
5. Extend the gear at or below 140 KIAS.
6. Below 111 KIAS, extend flaps incrementally.
 - a. Adjust pitch to maintain altitude as flaps are extended.
7. Maintain altitude until 88 KIAS and then establish a stabilized descent attitude at 88 KIAS.
8. Reduce power to idle while increasing pitch to V_y attitude.
9. Announce each of the three indications of a stall.
10. At the stall:
 - a. Verbally announce the stall.
 - b. Lower the pitch attitude sufficiently to break the stall.
 - c. Use the rudder to maintain directional control.
 - d. Maintain neutral ailerons.
 - e. Add full power.
 - f. Set flaps to 25°.
 - g. Retract the landing gear.
11. Adjust the pitch to an attitude that allows a positive rate of climb and an increase in airspeed to V_y .
12. As the aircraft accelerates through 88 KIAS, retract the flaps.
13. Upon reaching the specified recovery altitude, complete the flow check.

Note: This maneuver should be practiced at bank angles of 0-20°.

Power-On Stall

Objective: To teach the students to recognize the indications of an imminent or full stall during power on situations and to make prompt, positive, and effective recoveries with a minimum loss of altitude.

Procedure:

1. Perform this maneuver so that the recovery is completed at or above 3000' AGL.
2. Complete the flow check and CRAGS.
 - a. The propeller control should be placed full forward in the high RPM position.
3. Pick a visual reference point to assist in maintaining heading.
4. Reduce power to 12-13" MP.
5. Extend the landing gear at or below 140 KIAS.
6. Adjust pitch to maintain altitude.
7. At 75 KIAS, increase throttle to full power and retract landing gear.
8. Slowly increase pitch to an attitude which will induce a stall.
9. Verbally announce each of the three indications of a stall.
10. At the stall:
 - a. Verbally announce the stall.
 - b. Lower the pitch attitude sufficiently to break the stall.
 - c. Use the rudder to maintain directional control.
 - d. Maintain neutral ailerons.
 - e. Verify full power.
 - f. Verify flaps up.
11. Adjust the pitch to an attitude that allows a positive rate of climb and an increase in airspeed to V_y .
12. As the aircraft accelerates through 88 KIAS, lower the pitch to V_y attitude.
13. Upon reaching the specified recovery altitude, complete the flow check.

Note: This maneuver should be practiced at bank angles of 0-20°.

Secondary Stall

Objective: To teach the student to recognize the effects of improper control usage after initiating recovery from a stall.

Procedure:

1. Perform this maneuver so that the recovery takes place at or above 3000' AGL.
2. Complete the flow check and CRAGS.
 - a. The propeller controls should be placed full forward in the high RPM position.
3. Pick a visual reference point to assist in maintaining heading.
4. Set up as either a Power-On or Power-Off Stall.
5. Verbally announce each of the three indications of a stall.
6. At the stall:
 - a. Verbally announce the stall.
 - b. Lower the pitch attitude sufficiently to break the stall.
 - c. Use the rudder to maintain directional control.
 - d. Maintain neutral ailerons.
 - e. Add or maintain full power.
7. Before recovery, increase pitch attitude for a secondary stall.
8. At the stall:
 - a. Verbally announce the stall.
 - b. Lower the pitch attitude sufficiently to break the stall.
 - c. Use the rudder to maintain directional control.
 - d. Maintain neutral ailerons.
 - e. Add or maintain full power.
 - f. Set flaps to 25° and retract the landing gear (if extended).
9. Adjust the pitch to an attitude that allows a positive rate of climb and an increase in airspeed to V_y .
10. As the aircraft accelerates, lower the pitch to V_y attitude and incrementally retract flaps 25°(if extended).
11. Upon reaching the specified recovery altitude, complete the flow check.

Elevator Trim Stall

Objective: To teach the student the effects of not maintaining positive airplane control during a go-around.

Procedure:

1. Perform this maneuver so that the recovery takes place at or above 3000' AGL.
2. Complete the flow check and CRAGS.
 - a. The propeller controls should be placed full forward in the high RPM position.
3. Pick a visual reference point to assist in maintaining heading.
4. Reduce power to 12-13" MP.
5. Extend the landing gear at or below 140 KIAS.
6. Extend flaps as appropriate to conform with maximum flaps speeds.
 - a. Adjust pitch to maintain altitude as flaps are extended.
7. Maintain altitude until 88 KIAS and then establish a stabilized approach attitude at 88 KIAS and trim to maintain attitude.
8. Add full power:
 - a. Allow the pitch to increase to approximately V_x pitch attitude.
9. Verbally announce each of the three indications of a stall.
10. When the stall is imminent:
 - a. Verbally announce the stall.
 - b. Lower the pitch attitude sufficiently to break the stall.
 - c. Use the rudder to prevent a spin.
 - d. Maintain neutral ailerons.
 - e. Set flaps to 25°.
 - f. Retract the landing gear.
 - g. Trim the aircraft.
11. Adjust the pitch to an attitude that allows a positive rate of climb and an increase in airspeed to V_y .
12. Upon reaching the specified recovery altitude, complete the flow check.

Cross-Control Stall

Objective: To teach the student the effects of not maintaining positive airplane control during a go-around.

Procedure:

1. Perform this maneuver so that the recovery takes place at or above 3000' AGL.
2. Complete the flow check and CRAGS.
 - a. The propeller controls should be placed full forward in the high RPM position.
3. Reduce power to 12-13" MP.
4. Extend the landing gear at or below 140 KIAS.
5. At 88 KIAS, reduce power to idle.
6. Roll into a left or right bank not to exceed 30°.
7. Apply excessive rudder in the direction of turn and use opposite aileron to maintain bank angle.
8. Pitch the nose up above the horizon.
9. Verbally announce each of the three indications of a stall.
10. When the stall is imminent:
 - a. Verbally announce the stall.
 - b. Lower the pitch attitude slightly below a level pitch attitude.
 - c. Use coordinated control inputs to maintain directional control and level the wings.
 - d. Add full power.
 - e. Retract the landing gear.
11. Adjust the pitch to an attitude that allows a positive rate of climb and an increase in airspeed to V_y .
12. Upon reaching the specified recovery altitude, complete the flow check.

Note: Never perform this maneuver with flaps extended.

Accelerated Stall

Objective: To show the student that a stall is a function of angle of attack rather than airspeed.

Procedure:

1. Perform this maneuver so that the recovery takes place at or above 3000' AGL.
2. Complete the flow check and CRAGS.
 - a. The propeller controls should be placed full forward in the high RPM position.
3. Reduce power to 12-13" MP.
4. Extend the landing gear at or below 140 KIAS.
5. At 69 KIAS (1.2 times V_s):
 - a. Adjust pitch to maintain altitude.
 - b. Establish 45° of bank.
 - c. Smoothly increase back pressure until the onset of the stall (buffet).
6. At the buffet:
 - d. Verbally announce the onset of the stall.
 - e. Lower the pitch attitude slightly below a level pitch attitude.
 - f. Use coordinated control inputs to maintain directional control and level the wings.
 - g. Add full power.
 - h. Retract the landing gear.
7. Adjust the pitch to an attitude that allows a positive rate of climb and an increase in airspeed to V_y .
8. Upon reaching the specified recovery altitude, complete the flow check.

Note: Never perform this maneuver with flaps extended.

Spins

This maneuver is not authorized in the Seminole

Rectangular Course

Objective: To teach the student to plan and correct for the effects of wind while maneuvering the aircraft over a predetermined ground path.

Procedure:

1. Complete the flow check and CRAGS.
2. Perform this maneuver at or below maneuvering speed.
 - a. 17" MP and 2500 RPM should yield approximately 110 KIAS.
3. Determine the wind direction.
4. Select a rectangular area from which an emergency landing can be made should the need arise.
5. Plan to enter the maneuver for either a left or right pattern.
6. Enter the maneuver at 800-1000' AGL.
7. Enter the downwind on a 45° angle.
8. Throughout the maneuver, establish a crab angle to maintain a uniform distance around the rectangular reference area at approximately 1/2 mile.
9. Vary the bank angle as appropriate based upon groundspeed to maintain a constant radius during the turns.
10. At least one lap of the rectangle is required though more may be completed for practice purposes.
11. After the maneuver is complete, trim the aircraft for cruise and complete the flow check.

Turns Around A Point

Objective: To teach the student to plan and correct for the effects of wind while maneuvering the aircraft over a predetermined ground path.

Procedure:

1. Complete the flow check and CRAGS.
2. Perform this maneuver at or below maneuvering speed.
 - a. 17" MP and 2500 RPM should yield approximately 110 KIAS.
3. Determine the wind direction.
4. Select a reference point from which an emergency landing can be made should the need arise.
5. Enter the maneuver at 800-1000' AGL.
6. Recommended entry for the maneuver is on the downwind.*
7. Begin the turn once the wing is abeam the point.
8. Vary the bank angle as appropriate based upon groundspeed to maintain a constant radius during the turns.
 - a. The steepest bank angle should not exceed 45°.
9. At least one lap of the maneuver is required though more may be completed for practice purposes.
10. After the maneuver is complete, trim the aircraft for cruise and complete the flow check.

**Note: At the discretion of the flight instructor, entries other than those made on the downwind shall be practiced to verify the understanding of the relationship between groundspeed and required bank angle.*

S-Turns Across A Road

Objective: To teach the student to plan and correct for the effects of wind while maneuvering the aircraft over a predetermined ground path.

Procedure:

1. Complete the flow check and CRAGS.
2. Perform this maneuver at or below maneuvering speed.
 - a. 17" MP and 2500 RPM should yield approximately 110 KIAS.
3. Determine the wind direction.
4. Select a reference line that is perpendicular to the wind which allows for a single-engine landing to a suitable landing field if the need arises.
5. Enter the maneuver at 800-1000' AGL.
6. Enter the maneuver on the downwind.
7. Begin the turn back towards the reference line once the wing is abeam the reference line.
8. Vary the bank angle as appropriate based upon groundspeed to maintain a constant radius during the turns.
 - a. Adjust the pitch attitude to maintain altitude.
 - b. The steepest bank angle should not exceed 45°.
9. The wings should be level and in transit to the opposite direction turn as the aircraft crosses the reference line.
10. Repeat steps 7-9 in the opposite direction.
11. After the maneuver is complete, trim the aircraft for cruise and complete the flow check.

Loss of 02 Emergency Descent

Objective: To develop the student's ability to descend the airplane as rapidly as possible, within the limitations of the airplane.

Procedure:

1. Brief passengers on the maneuver.
2. Complete the flow check and CRAGS.
 - a. The propeller control should be placed full forward in the high RPM position.
3. Reduce power to idle.
4. Extend the gear at or below 140 KIAS and close the cowl flaps.
5. Lower the pitch of the aircraft while rolling into a 45° bank.
6. Adjust the pitch of the aircraft to maintain 140 KIAS.
7. Roll out of the maneuver after 90° of heading change by first rolling wings level and then pitching up.
8. Use a 30° S-turn to clear the area.
9. Smoothly advance the throttle to 15" MP in order to slow down to V_{10} or slower.
10. Retract the landing gear at or below 109 KIAS.
11. After the maneuver is complete, trim the aircraft for cruise and complete the flow check.

Note: Enriching of the mixtures may be required at the end of the maneuver PRIOR to advancing the throttle.

Note: This maneuver is permitted only on dual flights.

Note: Recover no lower than 500' AGL.

Caution: Do NOT exceed V_{no} unless in smooth air. Use V_a when necessary.

Engine Fire Emergency Descent

Objective: To develop the students ability to descend the airplane as rapidly as possible, within the limitation of the airplane.

Procedure:

1. Brief passengers on the maneuver.
2. Complete the flow check and CRAGS.
 - a. The propeller control should be placed full forward in the high RPM position.
3. Simulate the Engine Fire checklist
4. Reduce power to idle.
5. Extend the gear at or below 140 KIAS and close the cowl flaps.
6. Lower the pitch of the aircraft while rolling into a 45° bank.
7. Adjust the pitch of the aircraft to maintain 140 KIAS.
8. Roll out of the maneuver after 90° of heading change by first rolling wings level and then pitching up.
9. Use a 30° S-turn to clear the area.
10. Smoothly advance the throttle to 15" MP in order to slow down to V_{lo} or slower.
11. Retract the landing gear at or below 109 KIAS.
12. After the maneuver is complete, trim the aircraft for cruise and complete the cruise checklist.

Note: Enriching of the mixture may be required at the end of the maneuver before advancing the throttle.

Note: This maneuver is permitted only on dual flights.

Note: Recover no lower than 500' AGL.

Caution: Do NOT exceed V_{no} unless in smooth air. Use V_a when necessary.

Diversion

Objective: To develop skills necessary for plotting a new course and determining a new ETA while en route.

Procedure:

1. When diverting to a nearby airport (25 NM or less) and fuel is not critical, students will be expected to make estimates with a reasonable degree of accuracy rather than actual computations.
2. Note the starting position and time.
3. Determine location of new destination.
4. Turn into an estimated heading that will avoid any restricted or special use airspace, obstructions, or adverse weather.
5. Select some prominent landmarks to aid in flying the new course.
6. Determine distance and magnetic heading.
7. Compute ETE, ETA, fuel required, and compass heading.
8. Amend the flight plan with the appropriate Flight Service Station.
 - a. The pilot should check all applicable NOTAMs and TFRs for the diversion airport as well as the surrounding airspace.
9. Brief new destination airport information.

Lost Procedures

Objective: To gain proficiency in determining aircraft position and the corrections needed to reestablish the aircraft on course.

Procedure:

1. If unable to determine aircrafts position, complete the 6 C's.
 - a. CONFESS - Admit to yourself that you are lost.
 - b. CONSERVE - Reduce throttle and lean the mixture to get better fuel economy.
 - c. CLIMB - Climb to avoid obstructions, increase visibility, and improve radio reception.
 - d. CIRCLE - Pick a nearby landmark and stay in its general vicinity.
 - i. Use topographical features and/or electronic navigation to determine your position.
 - A. Topographical features:
 - I. Align the directional gyro with the magnetic compass.
 - II. Turn the sectional chart to match your heading.
 - III. Look outside to find prominent landmarks.
 - IV. Match the landmarks to the chart.
 - B. Electronic Navigation:
 - I. Align the directional gyro with the magnetic compass.
 - II. If using GPS, select the nearest USABLE airport and initiate the Direct To function.
 - III. If using a ground based Navaid, tune and identify the appropriate available station or stations and determine approximate location.
 - ii. If location is determined, return to the original course or initiate a diversion.
 - e. COMMUNICATE - Talk to ATC or FSS.
 - f. COMPLY - Follow ATC or FSS instructions.

Normal Approach and Landing

Objective: To develop the students ability to safely and accurately land the airplane in a designated area.

Procedure:

1. Fly the traffic pattern following the Traffic Pattern Operations procedure on page 5 of this document.
2. On the Final leg:
 - a. Set the flaps to 40°.
 - b. Adjust pitch and power to maintain the descent to touchdown point at 88 KIAS.
 - i. Add 1/2 gust factor as necessary.
3. Verbally announce “Three in the green, one in the mirror, props full forward, cleared to land.”
4. Once landing is assured, begin reducing power so that the throttles reach the full closed position as the main tires touch the ground within 200’ beyond a specified point.
5. Hold the nose gear off of the runway with back-pressure.
6. After the nose wheel has touched the ground, gently apply brakes while maintaining runway centerline.

Crosswind Approach and Landing

Objective: To develop the students ability to safely land the aircraft on the ground during crosswind conditions.

Procedure:

1. Fly the traffic pattern following the Traffic Pattern Operations procedure on page 5 of this document.
2. Note the wind direction and speed.
3. On the Final leg:
 - a. Set the flaps as appropriate to the wind speed.
 - b. Ensure that the airspeed is slightly faster than for a normal landing.
 - i. Add 1/2 gust factor as necessary.
4. Verbally announce “Three in the green, one in the mirror, props full forward, cleared to land.”
5. Maintain runway centerline and directional control with a “Side Slip.”
6. Once landing is assured, begin reducing power so that the throttles reach the full closed position as the main tires touch the ground.
7. Land on the upwind main tire first within 200’ beyond a specified point and then set the downwind main tire down on the runway in a controlled and deliberate manner.
8. Hold the nose gear off of the runway with back-pressure.
9. After the nose wheel has touched the ground, gently apply brakes while maintaining runway centerline.
10. Adjust the ailerons to keep the wings level during the ground roll.
11. Continue the appropriate crosswind correction for all taxi operations.

Note: With less than full flaps, the airplane will be in a higher nose-up attitude.

Note: Commercial students will be required to demonstrate the “Crab and Kick” technique of Crosswind Landing.

Short Field Approach and Landing

Objective: To teach the students how to obtain maximum performance from the aircraft so that the landing may be consistently accomplished with precision in a short distance.

Procedure:

1. Fly the traffic pattern following the Traffic Pattern Operations procedure on page 5 of this document.
2. On the Final leg:
 - a. Set the flaps to 40°.
 - b. Adjust pitch and power to maintain the descent to touchdown point at 75 KIAS.
 - i. Add 1/2 gust factor as necessary.
3. Verbally announce “Three in the green, one in the mirror, props full forward, cleared to land.”
4. Maintain the predetermined aiming point with pitch and power corrections until approaching the round out.
5. At the round out, reduce the power to idle and continue the flare to touchdown at the predetermined point within 100’ on the main tires first.
6. In a controlled and deliberate manner, lower the nose gear to the runway.
7. After the nose wheel has touched the ground, apply full back pressure with the yoke.
8. Retract the flaps to zero while verbalizing that the flap lever is being actuated as opposed to the landing gear switch.
9. Smoothly apply maximum braking without locking up the wheels and maintain runway centerline.

Note: This maneuver is NOT complete until the aircraft has come to a COMPLETE stop.

Note: Approach speed should be increased as required (typically half the gust factor) if turbulence or wind shear conditions exist.

Go-Around

Objective: To teach the student to discontinue the approach and attempt another approach under more favorable conditions.

Procedure:

1. Should the decision be made to go-around, the following should be accomplished in order:
 - a. Smoothly increase the throttles to the full open position.
 - b. Retract the flaps to 25°.
 - c. Retract the landing gear with a positive rate of climb.
 - d. Pitch up to an attitude which will obtain 82 KIAS.
 - e. Open the cowl flaps.
 - f. Retract the remaining flaps incrementally once a positive rate of climb has been established.
 - g. Accelerate to V_y .
2. At traffic pattern altitude, lower pitch to a level flight attitude and adjust power as necessary (approximately 17" MP and 2500 RPM) to maintain 110 KIAS.
3. To depart the pattern, continue straight out, or exit with a 45° turn in the direction of the traffic pattern.
4. At 1000' AGL, complete the climb checklist.

Note: The earlier a dangerous situation is recognized, the sooner a decision to reject the landing and begin a go-around, the safer the maneuver will be.

Vmc Demo

Objective: To teach the student to recognize the indications of loss of directional control from the loss of one engine.

Procedure:

1. Perform this maneuver so that the recovery takes place at or above 4000' AGL.
2. Complete the flow check and CRAGS.
 - a. The propeller control should be placed full forward in the high RPM position.
3. Pick a visual reference point to assist in maintaining heading.
4. Reduce power to 12-13" MP.
 - a. Verbally acknowledge the landing gear warning horn.
5. Adjust pitch to maintain altitude.
6. At 98 KIAS (10 KIAS above V_{yse} , reduce power to idle on either the left or right engine.
 - a. Increase throttle to full power on the other engine.
7. Slowly increase pitch to an attitude which will induce a one knot per second loss in airspeed.
8. Recover the aircraft when:
 - a. Gives the first indication of a stall.
 - b. Full deflection of the rudder is achieved.
 - c. Directional control is lost.
9. In order to recover:
 - a. Immediately reduce power on the operative engine.
 - b. Lower the pitch attitude sufficiently to accelerate.
 - c. Use the rudder to maintain directional control.
 - d. Increase power on the operative engine above V_{mc} .
 - e. Accelerate and maintain blue line (88 KIAS) with the operating engine.
10. At the completion of the maneuver, increase the throttle on the inoperative engine for a normal climb back to altitude.
11. Upon reaching the specified recovery altitude, complete the flow check.

Drag Demo

Objective: To demonstrate the effects of various configurations of flaps, gear and sideslip have on rate of climb during single engine operations.

Procedure:

1. Perform this maneuver so that the recovery is completed at or above 4000' AGL.
2. Complete the flow check and CRAGS.
 - a. The propeller control should be placed full forward in the high RPM position.
3. Pick a visual reference point to assist in maintaining heading.
4. Reduce power to 12-13" MP.
5. Extend the gear at or below 140 KIAS.
6. Below 111 KIAS, extend flaps incrementally.
 - a. Adjust pitch to maintain altitude as flaps are extended.
7. At 88 KIAS, increase throttle to full power on either the left or right engine.
 - a. Reduce power to idle on the other engine.
8. Maintain a constant heading and 88 KIAS while noting the descent rate.
9. Reduce flaps to 25° and note the descent rate.
10. Reduce flaps to 10° and note the descent rate.
11. Reduce flaps to 0° and note the descent rate.
12. Retract the landing gear and note the descent or climb rate.
13. Establish a zero sideslip configuration and note the rate of descent or climb.
14. Set the inoperative engine to zero thrust (12" MP and 2400 RPM) and note the rate of climb or descent.
15. At the completion of the maneuver, increase the throttle on the inoperative engine for a normal climb back to altitude.
16. Upon reaching the specified recovery altitude, complete the flow check.

Note: Do not apply full power to the simulated inoperative engine if cylinder head temp is below the green arc.

Engine Failure Below Vmc

Objective: To teach recognition and recovery of an engine failure if it occurs below Vmc.

Procedure:

1. Detect the engine loss.
2. Maintain directional control.
 - a. Immediately retard both throttles.
 - b. Maintain runway alignment with nose wheel steering.

Note: The instructor will fail the engine with a mixture lever at a speed no greater than 40 KIAS. If the student does not retard the throttles in a manner sufficient to prevent a loss of directional control, the instructor will then retard the other mixture and assume control of the aircraft.

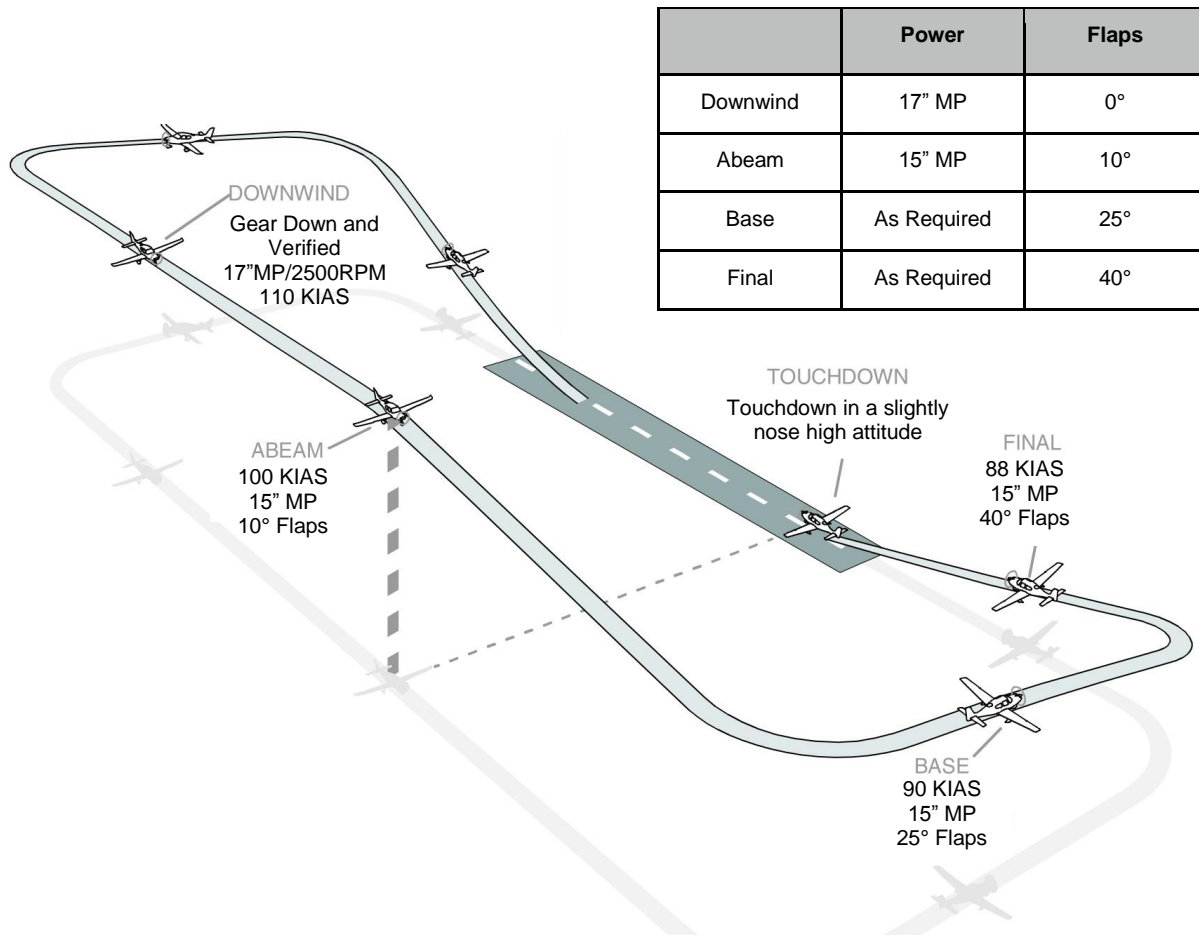
Engine Failure After Departure

Objective: To instruct the student on the course of action to be taken after an engine has failed on the departure leg.

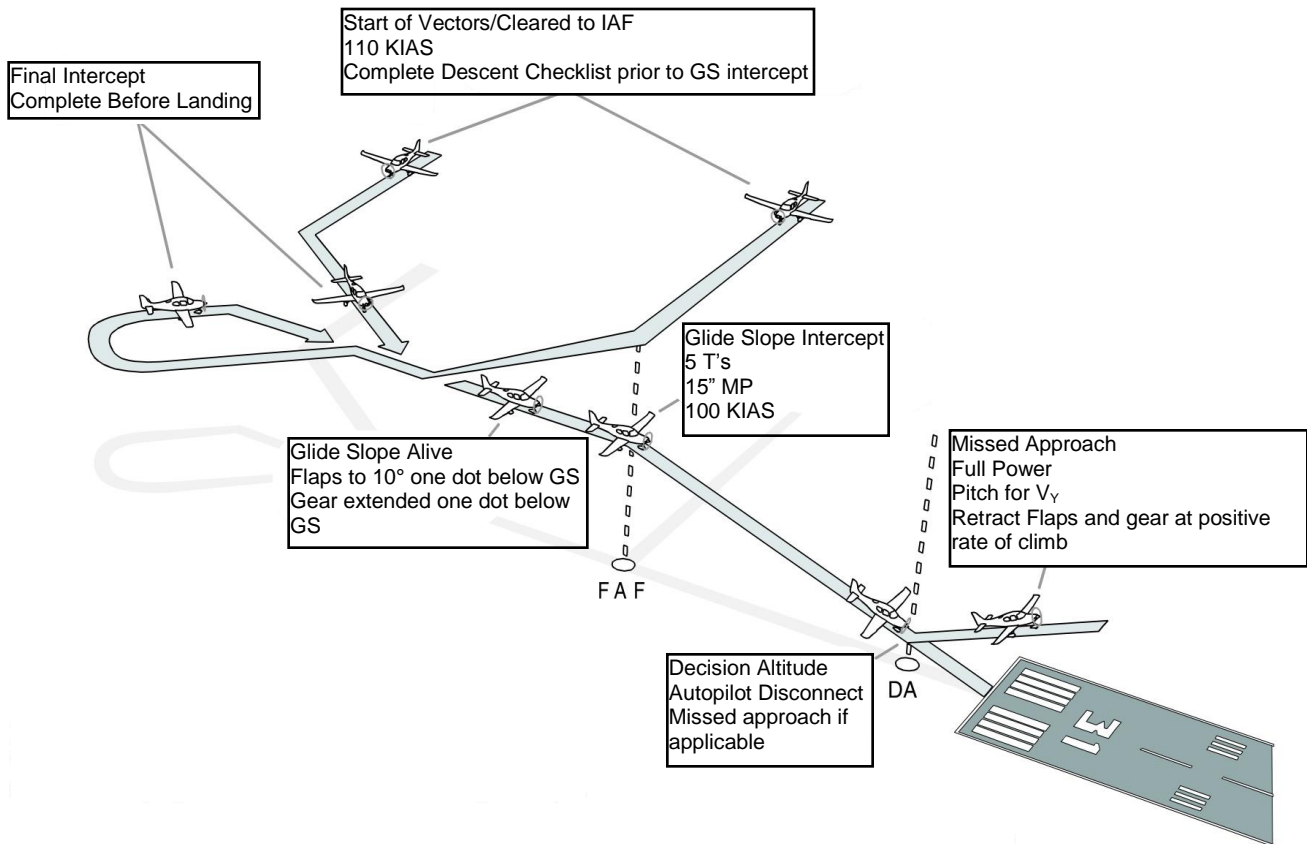
Procedure:

1. Detect that an engine has failed.
2. If usable runway is available, reduce power to idle, lower the flaps and land.
3. If there is no more usable runway remaining, complete the engine failure procedure:
 - a. Pitch for 88 KIAS.
 - b. Maintain directional control.
 - c. Perform the “6 ups”:
 - i. Mixtures, propellers, and throttles should be pushed full forward.
 - ii. Turn on the fuel pumps.
 - iii. Retract the landing gear and flaps (Note: If a positive rate of climb has been determined from the performance charts and obtained and no usable runway remains, then retract the landing gear).
 - d. Identify the inoperative engine.
 - e. Feather the inoperative engine (the instructor will then set the inoperative engine to zero thrust. 2180 RPM).
 - f. Establish zero sideslip condition.
 - g. Declare an emergency.
 - h. Configure the operating engine for optimum performance.
4. Determine if a turn back to the airport can be made based on the current performance.
5. If a positive rate of climb can be maintained using shallow turns, return to the airport. (Note: Use caution turning when the operating engine is the outside engine).
6. If unable to maintain a positive rate of climb, determine the most suitable landing site and prepare for an off airport landing.

Traffic Pattern



Precision Approach



Non-precision Approach

