

C172R

POWER SETTINGS FOR VARIOUS NORMAL FLIGHT OPERATIONS

AIRSPEED	FLAP SETTING	LEVEL/DESCENT RATE	POWER SETTING
90 KIAS	ZERO	LEVEL	1800 RPM
90 KIAS	ZERO	500 FPM	1600 RPM
90 KIAS	10 DEGREES	LEVEL	1900 RPM
90 KIAS	10 DEGREES	500 FPM	1500 RPM
90 KIAS	10 DEGREES	700 FPM	1400 RPM
90 KIAS	10 DEGREES	1000 FPM	1200 RPM
100 KIAS	ZERO	LEVEL	2000 RPM
100 KIAS	ZERO	500 FPM	1800 RPM
110 KIAS	ZERO	LEVEL	2200 RPM
110 KIAS	ZERO	500 FPM	1900 RPM
115 KIAS	ZERO	LEVEL	2250 RPM
115 KIAS	ZERO	500 FPM	2100 RPM

POWER SETTINGS LISTED ARE ONLY APPROXIMATE

&

WILL VARY DEPENDING ON DENSITY ALTITUDE AND OTHER CONDITIONS.



CESSNA 172R Maneuvers Manual

Revised June 2020



Leaning Procedures – On Ground

After starting the engine and when the engine is running smoothly:

1. Set the throttle to 1200 RPM
2. Lean the mixture for maximum RPM
3. Set the throttle to 800 to 1000 RPM for ground operations
4. Lean again after completing the BEFORE TAKEOFF checklist if delayed

Normal Takeoff and Climb

1. Flaps zero
2. Takeoff Briefing
 - a. Initial Heading and Altitude
 - b. Discuss intentions in case of an emergency
3. Clear Area
4. Taxi into position
 - a. Centered on runway
5. Smoothly apply full power
6. Check engine instruments
 - a. RPM 2065 – 2165 static full throttle (mixture leaned above 3000 ft elevation)
 - b. All other engine instruments in the green
7. At 55 KIAS
 - a. Rotate to V_y (79 KIAS) attitude
8. Maintain ground track along runway and extended centerline
9. Establish cruise climb (70 to 85 KIAS)
 - a. Minimum safe altitude 500 feet AGL
10. Complete Climb Checklist

Crosswind Takeoff and Climb

1. Flaps zero
2. Takeoff Briefing
 - a. Initial Heading and Altitude
 - b. Discuss intentions in case of an emergency
3. Clear Area
4. Taxi into position using proper control position for wind condition
 - a. Centered on runway
5. Position controls for the wind
 - a. Ailerons fully deflected into the wind
 - b. Elevator neutral
6. Smoothly apply full power
7. Check engine instruments
 - a. RPM 2065 – 2165 static full throttle (mixture leaned above 3000 ft elevation)
 - b. All other engine instruments in the green
8. As the aircraft accelerates down the runway adjust the ailerons as necessary leaving a small amount of deflection to ensure positive control at rotation
9. At 55 KIAS

Vspeeds for C-172R

Vspeed	C-172R
V _{so}	33 KIAS
V _s	44 KIAS
V _R (Normal)	55 KIAS
V _R (Short)	51 KIAS
Short Field T/O at 50' (10° flaps)	57 KIAS
V _x (sea level)	60 KIAS
V _y (sea level)	79 KIAS
V _{GLIDE}	65 KIAS
V _A (MAX GROSS)	99 KIAS
V _{FE} (10°)	110 KIAS
V _{FE} (10°-30°)	85 KIAS
V _{NO}	129 KIAS
V _{NE}	163 KIAS
V _{normal approach} (full flaps)	65 KIAS
V _{short field approach} (full flaps)	62 KIAS
Go around (20° flaps)	55 KIAS
Max. Dem. X/W	15 kts

MANUFACTURERS RECOMMENDED SPEEDS FOR MANEUVERS

(See Limitations Section)

Chandelles: 105 KIAS

Lazy Eights: 105 KIAS

Steep Turns: 95 KIAS

altitude. In no wind or light wind conditions, use 720 feet plus the elevation or around 800 to 900 around Ormond Beach or Cecil Airport.

5. Enter on a 45 degree angle to downwind and at 100 KIAS (2000 RPM) while flying diagonally between the reference points. The first turn will be made into the wind.
6. Enter a bank and increase as necessary (45 degree max.) to keep the reference point in sight.
7. Maintain the line-of-sight reference on the reference point.
8. As the turn is continued maintain the line-of-sight reference on the reference point by adjusting altitude. If reference point moves back from the line-of-sight reference – climb. If reference point moves forward from the line-of-sight reference - descend. You would normally expect to have to descend initially as the groundspeed will be decreasing as you turn into the wind.
9. Rollout as you approach a point between the reference points.
10. Allow 3 to 5 seconds of straight and level flight prior to beginning turn in the opposite direction.
11. Select new reference point if necessary and perform the maneuver exactly the same as the first turn in the opposite direction.
12. Maintain coordinated flight throughout the maneuver.
13. Discontinue the maneuver if high winds require you to fly below 500 feet AGL to maintain pivotal altitude upwind.
14. Depart the maneuver on the initial heading.
15. Resume Normal Cruise.

Emergency Descent

1. Complete clearing turns and pre-maneuver checklist
2. Select an altitude that will allow for recovery no lower than 1000 feet AGL. 2000 feet AGL or higher recommended.
3. To prevent shock cooling of the engine, minimize the amount of altitude loss when conducting the maneuver for practice. 1000 ft maximum altitude loss or 90° of turn recommended.
4. Set power to idle.
5. Simultaneously roll into a 45° bank (typically to the left). The bank helps increase the rate of descent while providing better visibility to clear the area below and helping to maintain positive load factors.
6. Lower the pitch angle to maintain 129 KIAS (Vno).
7. Upon completion of the maneuver, level the wings, smoothly increase the pitch, and increase the power upon reaching normal airspeed.
8. Resume Normal Cruise.

- a. Rotate to Vy (79R KIAS) attitude
10. As the aircraft lifts off
 - a. Hold the aileron into the wind
 - i. Downwind wing will rise first
 - ii. Downwind main wheel will liftoff first
 - iii. Initiate a crab into the wind to maintain runway alignment
11. Maintain ground track along runway and extended centerline
12. Establish cruise climb (70-85 KIAS)
 - a. Minimum safe altitude 500 feet AGL
13. Complete Climb Checklist

Short Field Takeoff and Climb

1. Flaps 10 degrees
2. Takeoff Briefing
 - a. Initial Heading and Altitude
 - b. Discuss intentions in case of an emergency
3. Clear Area
4. Taxi into position
 - a. Centered on runway
 - b. As close to the approach end as possible
5. Hold Brakes to prevent any movement
6. Smoothly apply full power
7. Check engine instruments
 - a. RPM 2065 – 2165 static full throttle (mixture leaned above 3000 ft elevation)
 - b. All other engine instruments in the green
8. Release Brakes
9. At 51 KIAS
 - a. Rotate to Vx (57 KIAS) climb attitude
10. Clear of Obstacles
 - a. Lower pitch to Vy (79 KIAS) attitude
11. 60 KIAS or above retract flaps
12. Maintain ground track along runway and extended centerline
13. Establish cruise climb (70 to 85 KIAS)
 - a. Minimum safe altitude 500 feet AGL
14. Complete Climb Checklist

Soft Field Takeoff and Climb

1. Flaps 10 degrees
2. Takeoff Briefing
 - a. Initial Heading and Altitude
 - b. Discuss intentions in case of an emergency
3. Clear Area
4. Taxi onto runway and smoothly apply full power without stopping
 - a. Maintain full up elevator

- b. Use minimum amount of braking
- 5. Check engine instruments
 - a. RPM 2065 – 2165 static full throttle (mixture leaned above 3000 ft elevation)
 - b. All other engine instruments in the green
- 6. Adjust backpressure to keep the nose wheel just off the runway – excessive back pressure will delay or prevent a liftoff and could cause a tail strike
- 7. Rotate at an airspeed slower than normal but sufficient to maintain altitude in ground effect
- 8. As the aircraft becomes airborne
 - a. Reduce pitch to stay in ground effect
- 9. At V_x (57 KIAS) if obstacles or V_y (79 KIAS)
 - a. Initiate climb
- 10. 60 KIAS or above retract flaps
- 11. Maintain ground track along runway and extended centerline
- 12. Establish cruise climb (70 – 85 KIAS)
 - a. Minimum safe altitude 500 feet AGL
- 13. Complete Climb Checklist

Traffic Pattern

Departure

- 1. Departing Traffic Pattern
 - a. At pattern altitude
 - i. Continue straight out
 - ii. Exit 45 degrees turn in the direction of the traffic pattern – do not initiate turn into the direction of the pattern until past the end of the runway or as directed
- 2. Remaining in Traffic Pattern
 - a. Within 300 feet below pattern altitude
 - i. Commence turn to crosswind leg
 - ii. Continue with Entry Procedures

Entry

- 1. Determine active runway
- 2. Scan for other aircraft throughout the pattern
- 3. Enter 45 degrees to the downwind leg (only at uncontrolled fields)
 - a. At Pattern Altitude
 - b. Abeam midpoint of the runway
- 4. Enter Downwind Leg: Ensure “Before Landing Checklist” is complete.
 - a. Maintain ½ to 1 miles distance from runway
 - b. Airspeed 100 KIAS
- 5. Maintain pattern altitude until abeam approach end of runway
 - a. Power 1500 RPM
 - b. Below 110 KIAS flaps 10 degrees
 - c. Airspeed 85 KIAS
- 6. Turn base
 - a. 45 degree angle from approach end of runway
 - b. Flaps 20 degrees
 - c. Airspeed 75 KIAS

Lazy Eights

- 1. Complete pre-maneuver checklist and clearing turns
- 2. Set Power to 2100 to 2200 RPM. Airspeed: 105 KIAS.
- 3. Mixture can remain leaned.
- 4. Pick a reference point off the wing tip in the direction of the turn.
- 5. Slowly increase bank and pitch to the 45 degree point. At this point the aircraft should be at maximum pitch (8-10 degrees) and about 15 degrees bank.
- 6. Increase the bank angle until the bank angle reaches 30 degrees at the 90 degree point while the pitch attitude should be allowed to decrease to level flight attitude (slicing through the horizon).
- 7. Allow the pitch and bank angle to continue to decrease so that at the 135 degree point the pitch is at its lowest point (about 6 degrees nose down) and the bank angle is approximately 15 degrees.
- 8. Slowly increase the pitch attitude and slowly decrease the bank angle so that the aircraft returns to straight and level flight at the entry altitude and airspeed as the 90 degree reference point is off the opposite wing tip.
- 9. Immediately begin the process in the opposite direction.
- 10. Resume normal cruise speed.

Steep Spirals

- 1. Complete pre-maneuver checklist and clearing turns
- 2. Begin at an altitude that will allow you to complete 3 descending 360 degree turns. At least 4000 AGL is recommended.
- 3. Select a prominent reference point such as a road intersection.
- 4. Enter the maneuver downwind.
- 5. Reduce the power to idle and establish a glide at 90 KIAS.
- 6. Mixture can remain leaned.
- 7. Roll into a steep bank (at least 45 degrees but no greater than 60 degrees) and adjust bank as necessary to correct for the effects of the wind and to maintain a constant radius turn around the reference point.
- 8. Each time you arrive upwind, increase power momentarily to clear the engine.
- 9. Depart the maneuver after completing three turns on the same heading as you began.
- 10. Return to cruise power setting.
- 11. Maintain altitude at or above 1500’ AGL and accelerate to normal cruise speed.

Eights on Pylons

- 1. Determine the wind direction
- 2. Complete pre-maneuver checklist and clearing turns
- 3. Select two suitable reference points that are close to a suitable emergency landing area and perpendicular to the wind.
- 4. Enter the maneuver at pivotal altitude. Use this formula as a reference: square the groundspeed (knots) and divide by 11.3 times. Add this to the elevation to get entry altitude.

11. Start the inbound leg time whenever wings level or intercepting the inbound course, whichever occurs first
12. Adjust outbound time and heading to ensure interception of the inbound course at the completion of the inbound turn and one minute inbound leg
 - a. Triple the inbound heading correction needed to hold the inbound course and apply properly to the outbound heading (typical maximum is 30 degree correction)
 - b. Adjust timing on the outbound leg as needed to maintain one minute inbound legs
13. Report departing hold and resume speed if enroute or continue with the approach and maintain 90 KIAS, 10 degrees flaps (1900 RPM)
14. When instructed to leave the hold at a certain time, adjust outbound and inbound legs so as to depart the fix at the exact time specified.

Recovery from Unusual Flight Attitudes

1. Nose high attitude:
 - a. Increase power to full.
 - b. Lower the nose and prevent a stall by applying forward elevator pressure.
 - c. Level the wings by applying coordinated aileron and rudder pressure.
2. Nose low attitude
 - a. Reduce power as necessary to prevent excessive airspeed and loss of altitude.
 - b. Level the wings by applying coordinated aileron and rudder pressure.
 - c. Raise the nose to level flight attitude by smoothly applying back elevator pressure.

Chandelles

1. Complete pre-maneuver checklist and clearing turns
2. Set Power to 2100 to 2200 RPM. Airspeed: 105 KIAS.
3. Mixture Rich.
4. Pick a reference point off the wing tip in the direction of the turn.
5. Roll into a coordinated 30 degree bank turn.
6. Simultaneously add full power.
7. Smoothly and constantly increase pitch to about 8-10 degrees nose up at the 90 degree point.
8. Maintain pitch by increasing the back pressure throughout the last 90 degrees of the maneuver.
9. Maintain rudder coordination throughout maneuver.
10. After passing the 90 degree point, begin a slow, constant rollout so as to arrive at the wings level position at the 180 degree position.
11. Upon reaching the 180 degree position, maintain altitude and accelerate to normal cruise speed.

7. Turn final
 - a. Roll out aligned with the runway
 - b. Flaps 30 degrees
 - c. Airspeed 65 KIAS (Normal Landing)
8. Execute appropriate landing procedure
9. Modify procedure as necessary for traffic to remain at safe altitudes and in trail of any aircraft ahead.

Normal Landing

1. Prior to 300 feet
 - a. Flaps 30 degrees
 - b. Aircraft stabilized
2. Airspeed 65 KIAS
 - a. Adjust speed for $\frac{1}{2}$ the gust factor
 - i. Winds (240 at 12 kts gusts 20 kts) gust factor 8
 - ii. $65 + 4 = 69$ KIAS
3. Begin round-out approximately 10-20 feet above the runway
 - a. Reducing power slowly to idle
 - b. Increase pitch to slow the descent
4. Just prior to touchdown increase pitch to a flared attitude
5. Land on the main gear
 - a. Hold the nose wheel off by maintaining back pressure
6. Brake as needed

Crosswind Landing

1. Prior to 300 feet
 - a. Flaps 30 degrees (or reduce as needed for crosswind)
 - b. Consider use of zero flaps in strong crosswind situations – use higher approach speeds with reduced flaps – see no flap landing)
 - c. Aircraft stabilized
5. Airspeed 65 KIAS
 - a. Adjust speed for $\frac{1}{2}$ the gust factor
 - ii. Winds (240 at 12 kts gusts 20 kts) gust factor 8
 - iii. $65 + 4 = 69$ KIAS
6. Use a side slip to control drift on final
 - a. Aileron to control drift
 - b. Rudder to keep the longitudinal axis aligned with the runway
7. Begin round-out approximately 10-20 feet above the runway
 - a. Reducing power slowly to idle
 - b. Increase pitch to slow the descent
8. Just prior to touchdown increase pitch to a flared attitude
9. Land on the main gear
 - a. Land on upwind wheel first
 - b. Hold the nose wheel off by maintaining back pressure

- c. Increase aileron deflection into the wind as speed decreases
- 10. Brake as needed
- 11. Continue with proper crosswind correction while exiting runway and taxiing.

Short Field Landing

- 1. Prior to 300 feet
 - a. Flaps 30 degrees
 - b. Aircraft stabilized
- 2. Airspeed 62 KIAS
 - a. Adjust speed for $\frac{1}{2}$ the gust factor
 - i. Winds (240 at 12 kts gusts 20 kts) gust factor 8
 - ii. $62 + 4 = 66$ KIAS
- 3. Clearing Obstacle
 - a. Initiate power reduction – reduce power slowly to ensure control
 - i. Throttle reaching idle just prior to touchdown
 - b. Begin round out and flare to arrive at the power off stall attitude at touchdown
- 4. Land on the main gear
- 5. At touchdown maintain nose up for aerodynamic braking
 - a. Retract the flaps
 - b. Apply brakes as needed to minimize landing roll

Soft Field Landing

- 1. Prior to 300 feet
 - a. Flaps 30 degrees
 - b. Aircraft stabilized
- 2. Airspeed 65 KIAS
 - a. Adjust speed for $\frac{1}{2}$ the gust factor
 - b. Winds (240 at 12 kts gusts 20 kts) gust factor 8
 - c. $65 + 4 = 69$ KIAS
- 3. Begin roundout approximately 10-20 feet above the runway
- 4. Use power as needed throughout the flare. Typically, reducing power to idle just prior to touchdown works best. Be ready to add power just after touchdown.
 - a. Touch down at minimum speed
- 5. Land on the main gear
 - a. Hold the nose wheel off as long as possible
 - b. Maintaining back pressure
 - c. Add power as required to keep nose up and prevent the plane from bogging down on an actual soft field
- 6. Avoid the use of brakes

No-Flap Landing

- 1. Prior to 300 feet
 - a. Flaps zero degrees
 - b. Aircraft stabilized

- 4. If no instructions, maneuver by the shortest path to that position
- 5. Adhere to all restrictions on circling on the approach chart
- 6. Stay within 1 mile of the runway
- 7. Maintain circling MDA until in a position to make a normal descent to landing, power set to approximately 1900 RPM, maintain 90 KIAS with 10 degrees of flaps set
- 8. When ready to descend to a landing, Reduce power
- 9. Set final flaps as needed when at or below 85 KIAS.
- 10. Complete normal landing.

Holding

- 1. Obtain holding clearance. Do not accept the holding clearance without receiving an Expect Further Clearance (EFC) time.
- 2. Tune and identify navaid (if appropriate)
- 3. Reset heading indicator (or HSI) with compass
- 4. Determine appropriate entry
 - a. Direct
 - b. Parallel
 - c. Tear Drop
- 5. Within 3 minutes of the fix, reduce power to approximately 2000 RPM
- 6. Airspeed 100 KIAS with Flaps zero degrees unless hold is part of the initial approach procedure. If hold is part of the initial approach procedure use 90 KIAS with 10 degrees flaps (1900 RPM)
- 7. When over the fix, Do the “5 T’s”
 - a. Time: note the time
 - b. Turn: to the proper heading for the entry
 - a. Twist: verify you have the INBOUND course properly set on the HSI or heading indicator
 - c. Throttle: adjust as needed maintain 90 KIAS
 - d. Talk: Report time and altitude entering the hold
- 8. When inbound over the fix, turn to the outbound heading
- 9. Abeam the fix or wings level, whichever is last, start the time for the outbound leg. If the abeam position cannot be determined start timing when the turn to the outbound leg is completed. When a VOR is the fix, use the first complete reversal of the To/From indicator.
- 10. After one minute outbound, or as adjusted for wind, turn to intercept the inbound course
 - a. Unless DME is used to define the distance for the inbound leg, use one minute for altitudes 14,000’ MSL and below or 1 and $\frac{1}{2}$ minutes for altitudes above 14,000’ MSL, or as assigned by ATC
 - b. Maximum holding speeds

ALTITUDE	AIRSPEED (KIAS)
MHA-6000’	200
6,001-14,000	230
14,001 and above	265

No Gyro ASR Approach

1. Prior to commencing approach, complete Approach Briefing and state "APPROACH BRIEFING COMPLETE"
2. Maintain 100 KIAS (2000 RPM)
3. Follow heading and altitude instructions as given by ATC. ATC will issue heading changes by using the following terminology:
 - a. Turn left (or right)
 - b. Stop turn
 - c. All turns are executed at Standard Rate, except on final approach use half-standard rate
 - d. ATC may tell us that you do not need to verbally respond to the ATC commands.
4. Course guidance will be provided by ATC
5. Below 110 KIAS, set flaps 10 degrees
6. Maintain 90 KIAS (1900 RPM)
7. Begin descent to MDA when instructed by ATC. Reduce power to establish desired descent rate while maintaining 90 KIAS. A descent rate of 700 to 800 fpm is sufficient for almost all non-precision approaches. Do NOT exceed a descent rate of 1000 fpm. Adjust pitch for 90 KIAS (1200 to 1400 RPM). Trim. Adjust power for appropriate descent rate under actual conditions.
8. At 1000' above MDA, state "1000 FEET TO MINIMUMS"
9. At 500' above MDA, state "500 FEET TO MINIMUMS"
10. At 100' above MDA, state "100 FEET TO MINIMUMS"
11. Leveling off at MDA, add power back to approximately 2000 RPM, maintain 90 KIAS
12. At MDA and at a position from which a descent to a landing on the intended runway can be made at a normal rate of descent, initiate the descent only when at least one visual reference for the runway is visible and the FLIGHT visibility is not less than prescribed for the approach. See FAR 91.175 for additional references.
State "RUNWAY IN SIGHT, LANDING"
or if only the approach lighting is in sight, state
"APPROACH LIGHTS IN SIGHT, CONTINUING"
followed by "RUNWAY IN SIGHT, LANDING"
OR
"MISSED APPROACH"
if visual reference is not in sight or is lost while continuing descent.
Execute Go-Around/Rejected Landing procedure.
13. Reduce power
14. Set final flaps as needed when at or below 85 KIAS.
15. Complete normal landing.

Circling Approach

1. Maintain sight of the runway
2. State "RUNWAY IN SIGHT, CIRCLING"
3. Follow ATC instructions for maneuvering to the base or downwind leg

- c. Use a forward slip if you need to lose altitude
2. Airspeed 70 KIAS
 - a. Adjust speed for $\frac{1}{2}$ the gust factor
 - i. Winds (240 at 12 kts gusts 20 kts) gust factor 8
 - ii. $70 + 4 = 74$ KIAS
3. Begin round-out approximately 10-20 feet above the runway
 - a. Reducing power slowly to idle
 - b. Increase pitch to slow the descent
4. Just prior to touchdown increase pitch to a flared attitude
5. Land on the main gear
 - a. Hold the nose wheel off by maintaining back pressure
6. Brake as needed

Power-Off 180° Accuracy Approach and Landing

1. Request "Short Approach" if at a tower controlled airport
2. Keep the downwind leg closer to the runway than normal
3. Ensure that "Before Landing Checklist" is complete
4. Select a touchdown point within the first 1/3 of the runway but do not select the threshold
5. Take into account the wind when determining a plan for the approach
6. Reduce throttle to idle abeam intended touchdown point.
7. Establish and maintain 65 KIAS (Best Glide Speed)
8. Set first notch of flaps (10 degrees)
9. Depending on wind condition, wait on additional use of flaps until certain the touchdown point can be made. Partial flaps may be needed to ensure the touchdown on or within 200 feet beyond the specified touchdown point.
10. A steeper than normal turn to the base leg may be necessary depending on the wind conditions. Compensate for wind drift by crabbing into the wind on the base leg.
11. Plan your turn to final approach at approximately 600-700 feet AGL.
12. Consider use of forward slip if you are extremely high.
13. At 300 feet verify again that the Before Landing Checklist is complete. Verify that the approach is "stabilized."
14. Watch airspeed on short final.
15. Do not attempt to stretch the glide by pitching up and reducing airspeed below 65 KIAS. Do NOT reduce the flaps once added. If necessary, go around.
16. Go-around whenever you see an excessive sink rate, low airspeed, or that you will land short of your specified touchdown point
17. Touchdown on the main gear first
18. Brake as needed after landing

Go-Around

1. Apply full power
2. Retract flaps to 20 degrees

3. Initiate climb at 55 KIAS
4. Side step to one side of runway if necessary to avoid traffic ahead
5. Positive rate of climb, retract flaps to 10 degrees
6. Above 60 KIAS and clear of obstacles, flaps to zero
7. Pitch for airspeed V_y (79 KIAS)

Emergency Approach and Landing

1. Establish Best Glide (65 KIAS)
2. Locate suitable landing site
 - a. Consider the following
 - i. Can I reach a suitable airport nearby
 - ii. Landing site may be beneath or behind you
 - iii. Altitude
 - iv. Winds (Smoke, Water, last known wind direction)
 - v. Terrain
3. Complete Engine Failure Checklist
4. Distress call (if time permits)
 - a. 121.5
 - b. 7700 (transponder)
5. Complete Landing without Power Emergency Checklist
6. Maneuver aircraft to key position (depending on altitude)
 - a. Downwind leg (high key at 1000 ft)
 - b. Base leg (low key 500 ft)
7. Modify base and final legs as necessary to ensure reaching airport
8. Use flaps only as altitude and position permits
9. Final approach airspeed, 65 KIAS flaps zero or 60 KIAS flaps 30°
10. Unlatch doors for evacuation after landing
11. Complete power off landing

Pre-Maneuver Check/Clearing Turns (CHAPS checklist)

1. Identify a suitable emergency landing site
2. C: Clearing turn— execute for minimum total 180 degrees
3. H: Heading— note. Use heading bug and outside reference.
4. A: Altitude - no lower than 2000 feet AGL recommended. Hard floor=1500 AGL.
5. P: Proper configuration: (lights, flaps up/down, mixture, carb heat)
6. S: Safe place to land: identify

Transfer of Flight Controls

1. Pilot Flying (PF) Transfers to (PNF)
 - a. PF “You have the flight controls”

Airport Surveillance Radar (ASR) Approach

1. Prior to commencing approach, complete Approach Briefing and state “APPROACH BRIEFING COMPLETE”
 2. Maintain 100 KIAS (2000 RPM)
 3. Follow heading and altitude instructions as given by ATC
 4. Course guidance will be provided by ATC
 5. Below 110 KIAS, set flaps 10 degrees
 6. Maintain 90 KIAS (1900 RPM)
 7. Begin descent to MDA when instructed by ATC. Reduce power to establish desired descent rate while maintaining 90 KIAS (1200 to 1400 RPM). A descent rate of 700 to 800 fpm is sufficient for almost all non-precision approaches. Do NOT exceed a descent rate of 1000 fpm. Adjust pitch for 90 KIAS if necessary. Trim as necessary. Adjust power for appropriate descent rate under actual conditions.
 8. At 1000’ above MDA, state “1000 FEET TO MINIMUMS”
 9. At 500’ above MDA, state “500 FEET TO MINIMUMS”
 10. At 100’ above MDA, state “100 FEET TO MINIMUMS”
 11. Leveling off at MDA, add power back to approximately 1900 RPM, maintain 90 KIAS
 12. At MDA and at a position from which a descent to a landing on the intended runway can be made at a normal rate of descent, initiate the descent only when at least one visual reference for the runway is visible and the FLIGHT visibility is not less than prescribed for the approach. See FAR 91.175 for additional references.
- State “RUNWAY IN SIGHT, LANDING”
 or if only the approach lighting is in sight, state
 “APPROACH LIGHTS IN SIGHT, CONTINUING”
 followed by “RUNWAY IN SIGHT, LANDING”
 OR
 “MISSED APPROACH”
 if visual reference is not in sight or is lost while continuing descent.
 Execute Go-Around/Rejected Landing procedure.
13. Reduce power
 14. Set final flaps as needed when at or below 85 KIAS.
 15. Complete normal landing.

OR

“MISSED APPROACH”

if visual reference is not in sight or is lost while continuing descent.

Execute Go-Around/Rejected Landing procedure.

13. Continue to maintain the localizer and glideslope during the remaining descent.

14. Reduce power and Set Final Flaps as needed when at or below 85 KIAS.

15. Complete normal landing.

Non-Precision Approach

1. Prior to commencing approach, complete Approach Briefing and state “APPROACH BRIEFING COMPLETE”

2. Maintain 100 KIAS (2000 RPM)

2. State “COURSE ALIVE” when CDI becomes active

4. Below 110 KIAS, set flaps 10 degrees

5. Maintain 90 KIAS (1900 RPM)

6. At the FAF, reduce power to establish desired descent rate while maintaining 90 KIAS (1200 to 1400 RPM). A descent rate of 700 to 800 fpm is sufficient for almost all non-precision approaches. Do NOT exceed a descent rate of 1000 fpm. Adjust pitch for 90 KIAS if necessary. Trim as necessary. Adjust power for appropriate descent rate under actual conditions.

7. At the FAF, Perform the “5 Ts”:

a. Time: note the time and track to MAP

b. Turn: verify you are tracking the localizer

c. Twist: verify you have the course properly set on the HSI

d. Throttle: adjust to maintain 90 KIAS

e. Talk: call the tower or make other reports as required

8. At 1000’ above MDA, state “1000 FEET TO MINIMUMS”

9. At 500’ above MDA, state “500 FEET TO MINIMUMS”

10. At 100’ above MDA, state “100 FEET TO MINIMUMS”

11. Leveling off at MDA, add power back to approximately 1900 RPM, maintain 90 KIAS

12. At MDA and at VDP or at a position from which a descent to a landing on the intended runway can be made at a normal rate of descent, initiate the descent only when at least one visual reference for the runway is visible and the FLIGHT visibility is not less than prescribed for the approach. See FAR 91.175 for additional references.

State “RUNWAY IN SIGHT, LANDING”

or if only the approach lighting is in sight, state

“APPROACH LIGHTS IN SIGHT, CONTINUING”

followed by “RUNWAY IN SIGHT, LANDING”

OR

“MISSED APPROACH”

if visual reference is not in sight or is lost while continuing descent.

Execute Go-Around/Rejected Landing procedure.

13. Continue to maintain the course guidance during the remaining descent.

14. Reduce power

15. Set final flaps as needed when at or below 85 KIAS.

16. Complete normal landing.

b. PNF “I have the flight controls”

c. Old PF “You have the flight controls”

i. Relinquish the Controls

2. The PF should never be in doubt

3. A visual check should be made to ensure that the transfer was successful

Slow Flight Clean Configuration

1. Slow flight will be completed no lower than 1500 feet AGL

2. Complete pre-maneuver CHAPS checklist

3. Stabilize A/C (Heading, Altitude, Airspeed)

4. Reduce Power to 1500 RPM

5. Adjust pitch to maintain altitude

6. As airspeed slows to MCA (Vs1 44 KIAS), note speed at which stall horn activates.

a. Increase power (approx. 1900 RPM) to maintain 5-10 kts above stall horn speed.

b. Make small pitch, bank, and power changes

7. Maneuvering at 5-10 kts above stall horn

a. Straight and Level

b. Turns (30 degree bank max)

c. Climbs and descents

8. Recovery

a. Smoothly add full power

b. Adjust pitch to maintain altitude

9. Resume Normal Cruise

Slow Flight Specified and Landing Configuration

1. Slow flight will be completed no lower than 1500 feet AGL

2. Complete pre-maneuver CHAPS checklist

3. Stabilize A/C (Heading, Altitude, Airspeed)

4. Reduce Power to 1500 RPM

5. Adjust pitch to maintain altitude

6. Below 110 KIAS add flaps as directed

7. As airspeed slows towards MCA (Vs0 33 KIAS), note speed at which stall horn activates.

a. Increase power (approx. 2100 RPM) to maintain speed 5-10 kts above stall horn speed.

b. Make small pitch, bank, and power changes

10. Maneuvering at 5-10 kts above stall horn

a. Straight and Level

b. Turns (30 degree bank max)

c. Climbs and descents

11. Recovery

a. Smoothly add full power

b. Adjust pitch to maintain altitude

c. Retract flaps to 20 degrees

d. Retract flaps to 10 degrees above 55 KIAS

e. Retract flaps to 0 degrees above 60 KIAS

12. Resume Normal Cruise

Stalls Clean Configuration – Power ON

1. All stalls will be completed no lower than 1500 feet AGL
2. Complete pre-maneuver CHAPS checklist
3. Stabilize A/C (Heading, Altitude, Airspeed)
4. Reduce Power to 1200 RPM
5. Adjust pitch to maintain altitude
6. As airspeed approaches liftoff speed (approx.60 KIAS)
 - a. Smoothly add full power
 - b. Slowly increase pitch attitude
7. Announce “Stall” or “Impending Stall” as appropriate and initiate recovery
 - a. Full Stall (required for Private Pilots)
 - i. A sudden loss of control effectiveness occurs, excessive sink rate, or sudden nose pitch down with full up elevator is experienced.
 - b. Impending Stall (required for Commercial Pilots)
 - i. The first indication of a stall (ie stall horn / light)
8. Recovery
 - a. Reduce pitch attitude
 - b. Level wings
 - c. Pitch for Vx (60 KIAS) or Vy (79 KIAS) attitude depending on obstacles
 - i. Minimize altitude loss
 - ii. Establish Positive Rate of Climb
9. Resume Normal Cruise

Stalls Specified and Landing Configuration – Power OFF

1. All stalls will be completed no lower than 1500 feet AGL
2. Complete pre-maneuver CHAPS checklist
3. Stabilize A/C (Heading, Altitude, Airspeed)
4. Reduce Power to 1500 RPM
5. Adjust pitch to maintain altitude
6. Below 110 KIAS extend flaps to 30 degrees
7. As airspeed approaches 65 KIAS
 - a. Lower pitch establish glide at 65 KIAS, descend at least 100'
 - b. Reduce power to idle
 - c. Slowly increase pitch to flare attitude
8. Announce “Stall” or “Impending Stall” as appropriate and initiate recovery
 - a. Full Stall (required for Private Pilots)
 - i. A sudden loss of control effectiveness occurs, excessive sink rate, or sudden nose pitch down with full up elevator is experienced.
 - b. Impending Stall (required for Commercial Pilots)
 - i. The first indication of a stall (ie stall horn / light)
9. Recovery
 - a. Reduce pitch attitude
 - b. Smoothly add full power

- b. Turn: to track the outbound course
 - c. Twist: set the OBS to the course
 - d. Throttle: at or below 110 KIAS set flaps 10 degrees, maintain 90 KIAS (1900 RPM), trim for 90 KIAS.
3. Begin descent to initial approach altitude
4. Complete Descent Checklist
5. Complete course reversal within published limit (usually 10 nm)
 - a. Use course reversal depicted on the chart
 - b. When timing outbound use 2 minutes prior to starting course reversal.
6. Set OBS to inbound course
7. Intercept inbound course and descend as published. Continue to maintain 90 KIAS.

Precision Approach

1. Prior to commencing approach, complete Approach Briefing and state “APPROACH BRIEFING COMPLETE”
2. Maintain 100 KIAS (2000 RPM)
3. Below 110 KIAS, set flaps 10 degrees
4. Maintain 90 KIAS (1900 RPM)
5. State “LOCALIZER ALIVE” when CDI becomes active
6. State “GLIDESLOPE ALIVE” when glideslope becomes active
7. At the FAF (glide slope intercept) reduce power to approximately 1500 RPM, adjust pitch down, trim if necessary and maintain 90 KIAS while descending and tracking the glide slope. Adjust power if needed for appropriate descent rate under actual conditions. Typical descent rates required are 450-500 fpm.
 - a. Verify the correct altitude of the glideslope at the LOM or other appropriate waypoint
8. At the OM, LOM, or glide slope intercept perform the “5 Ts”:
 - a. Time: note the time and track to MAP
 - b. Turn: verify you are tracking the localizer
 - c. Twist: verify you have the course properly set on the HSI
 - d. Throttle: adjust to maintain 90 KIAS
 - e. Talk: call the tower or make other reports as required
9. At 1000' above DH, state “1000 FEET TO MINIMUMS”
10. At 500' above DH, state “500 FEET TO MINIMUMS”
11. At 100' above DH, state “100 FEET TO MINIMUMS”
12. At DH, continue the descent only when at least one visual reference for the runway is visible and the FLIGHT visibility is not less than prescribed for the approach. See FAR 91.175 for additional references.
State “RUNWAY IN SIGHT, LANDING”
or if only the approach lighting is in sight, state “APPROACH LIGHTS IN SIGHT, CONTINUING”
followed by “RUNWAY IN SIGHT, LANDING”

6. The compass lags in the north and lead in the south. UNOS is a good acronym, Undershoot North, Overshoot South.
7. The amount of rollout is as follows
8. 360 or 180 degree headings: 30 degrees
9. 030, 150, 210, 330 degree headings: 20 degrees
10. 060, 120, 240, 300 degree headings: 10 degrees
11. 090 or 270 degree headings: 0 degrees

Timed Turns to Magnetic Compass Headings

1. Verify the turn coordinator is calibrated correctly.
2. Determine the number of degrees to be turned and compute the time needed to accomplish the turn at a standard rate (3 degrees per second).
3. Note the time as the roll in to a standard rate turn is initiated.
4. When the computed time to turn expires, initiate a roll out.

Instrument Approach Briefing

1. Should be completed no later than 5 miles from the airport
2. Review the current weather at the airport after obtaining from ATIS or other sources
3. Verify using the correct instrument approach chart
4. Verify the date on the instrument approach chart (if crew environment)
5. Verify the correct nav frequency, set, and identify
6. Verify the final approach course. Set in #1 nav.
7. Verify landing runway, runway length and airport elevation and TDZE (touchdown zone elevation)
8. Review altitudes including DH or MDA and time to MAP if applicable
9. Review Missed Approach Procedure and set initial course in #2 nav
10. Review minimum safe altitude
11. The above can be completed by reviewing the top, briefing portion of the appropriate instrument approach chart

Radar Vectors for Approach

1. Complete "Approach Briefing"
2. Within 30 degrees of the final approach course, or 5 miles from the FAF
 - a. Slow to 100 KIAS (2000 RPM)
 - b. Set flaps to 10 degrees (below 110 KIAS)
 - c. Maintain 90 KIAS (1900 RPM)
 - d. Trim for 90 KIAS
3. Complete Descent Checklist

Approaches with Course Reversal (Full Approaches)

1. Complete "Approach Briefing"
2. Maintain 100 KIAS (2000 RPM)
3. At the IAF, do the 5 T's
 - a. Time: note the time

- c. Level wings
 - d. Pitch for V_x (60 KIAS) or V_y (79 KIAS) attitude depending on obstacles
 - i. Minimize altitude loss
 - e. Retract flaps to 20 degrees immediately
 - f. Establish Positive Rate of Climb
 - g. Retract flaps to 10 degrees above 55 KIAS
 - h. Retract flaps to 0 degrees above 60 KIAS
10. Resume Normal Cruise

Accelerated Stall (Commercial and CFI Only)

1. Select an altitude that will allow recovery no lower than 3000 AGL
2. Complete clearing turns and pre-maneuver CHAPS checklist
3. Stabilize A/C (Heading, Altitude, Airspeed)
4. Reduce power to 1500 RPM.
5. Adjust pitch to maintain altitude
6. As airspeed approaches 95 KIAS, enter a coordinated 45 degree bank in either direction while smoothly increasing back pressure to maintain altitude and adjusting ailerons so as not to exceed a 45 degree bank.
7. Establishing the bank quickly will ensure completing the stall in about 90 degrees of turn.
8. Increase back pressure to maintain altitude until stall occurs.
9. Announce the imminent stall at stall horn
10. Recovery
 - a. Reduce pitch attitude
 - b. Smoothly add full power
 - c. Level wings
 - d. Pitch for V_x (60 KIAS) or V_y (79 KIAS) attitude depending on obstacles
 - i. Minimize altitude loss
 - ii. Establish Positive Rate of Climb
11. Resume Normal Cruise

Secondary Stall (Demonstration Only)

1. Select an altitude that will allow recovery no lower than 3000 AGL
2. Complete clearing turns and pre-maneuver checklist
3. Stabilize A/C (Heading, Altitude, Airspeed)
4. Reduce power to 1500 RPM.
5. Adjust pitch to maintain altitude
6. Below 110 KIAS extend flaps to 30 degrees
7. As airspeed approaches 65 KIAS
 - a. Lower pitch establish glide at 65 KIAS
 - b. Reduce power to idle
 - c. Slowly increase pitch to flare attitude
8. Announce "Stall" and initiate recovery
 - a. Imminent Stall

- i. The first buffet, or rapid decay of control effectiveness
- b. Full Stall
 - i. A sudden loss of control effectiveness occurs, excessive sink rate, or sudden nose pitch down with full up elevator is experienced
- 9. Initiate recovery by reducing the pitch angle.
- 10. Immediately increase pitch attitude by adding excessive back pressure to induce another (secondary) stall
- 11. Announce “Stall” and initiate recovery
- 13. Recovery
 - a. Reduce pitch attitude
 - b. Smoothly add full power
 - c. Level wings
 - d. Pitch for V_x (60 KIAS) or V_y (79 KIAS) attitude depending on obstacles
 - i. Minimize altitude loss
 - e. Retract flaps to 20 degrees immediately
 - f. Establish Positive Rate of Climb
 - g. Retract flaps to 10 degrees above 55 KIAS
 - h. Retract flaps to 0 degrees above 60 KIAS
- 12. Resume Normal Cruise

Elevator Trim Stall (Demonstration Only)

1. Select an altitude that will allow recovery no lower than 3000 AGL
2. Complete clearing turns and pre-maneuver checklist
3. Stabilize A/C (Heading, Altitude, Airspeed)
4. Reduce power to 1500 RPM.
5. Adjust pitch to maintain altitude
6. Below 110 KIAS extend flaps to 30 degrees
7. As airspeed approaches 65 KIAS
 - a. Lower pitch establish glide at 65 KIAS
 - b. Reduce power to idle
 - c. Trim for 65 KIAS
8. Apply full power and allow pitch attitude to increase above the normal climb attitude
9. Announce “Stall” and initiate recovery
 - a. Imminent Stall ONLY
 - i. The first buffet, or rapid decay of control effectiveness
10. Initiate recovery by reducing the pitch angle.
11. Recovery
 - a. Reduce pitch attitude
 - b. Level wings
 - c. Pitch for V_x (60 KIAS) or V_y (79 KIAS) attitude depending on obstacles
 - i. Minimize altitude loss
 - d. Retract flaps to 20 degrees immediately
 - e. Establish Positive Rate of Climb

8. Turn to the intercept heading determined and hold the heading constant until the CDI begins to center.
9. As the CDI begins to center, begin turning to the heading corresponding to the radial or course selected.
10. Track the radial (outbound) or course (inbound), as appropriate.

VOR Radial Tracking

1. After the course has been intercepted, maintain the heading that corresponds to the course selected.
 2. If the CDI should move off center, re-intercept by beginning with a 20 degree change (intercept angle) in heading (intercept heading) toward the deflection of the CDI.
 3. Maintain the intercept heading until the CDI re-centers, and then turn back to a new course by taking out ½ of the intercept angle.
 4. EXAMPLE: The airplane has drifted to the right of the 090-degree radial (outbound). To re-intercept the radial, a left turn is made to a heading of 070 degrees. When the CDI re-centers, a right turn is made to maintain a new Course Heading of 080 degrees (10 degree Wind Correction Angle).
 5. If the CDI should move off center, re-intercept by beginning with a 10 degree change in heading (intercept heading) toward the deflection of the CDI.
 6. Maintain the intercept heading until the CDI re-centers, and then turn back to a new course heading by taking out ½ of the heading change.
 7. EXAMPLE: The airplane has drifted again to the right of 090 degree radial (outbound). To re-intercept the radial, a left turn is made to a heading of 070 degrees (10 degree change). When the CDI re-centers, a right turn is made to maintain a new Course Heading of 075 degrees (5 degree change, 15 degree Wind Correction Angle).
- NOTE: Wind conditions may require the use of intercept angles greater than 20 degrees to change the direction of the CDI deflection. However, the same “bracketing” procedures outlined above are still applicable.

Magnetic Compass Turns

1. Determine the latitude in which the aircraft is operating. Magnetic compass turning errors are approximately equivalent to the airplane’s latitude.
2. Estimate the amount of northerly turning error that corresponds to the heading to be flown.
3. Enter a standard rate turn in the appropriate direction.
4. When turning to a northerly heading, apply the normal rollout lead (1/2 the angle of bank) to the magnetic compass heading, adjusted for the amount of northerly turning error.
5. When turning to a southerly heading, apply the normal rollout lead (1/2 the angle of bank) to the magnetic compass heading, adjusted for the amount of southerly turning error.

Lost Procedures (Climb.Communicate.Confess.Comply. Conserve)

1. Maintain positive aircraft control at all times.
2. Remain calm.
3. Climb higher if weather and airspace permits to get a better perspective on the surrounding area and landmarks. This will also help with VHF radio reception.
4. Conserve fuel by leaning the engine for a best economy operation and reducing power as much as practical.
5. Maintain situational awareness, using a sectional chart and nav aids.
6. Obtain your Sectional chart.
7. Reset the heading indicator.
8. Turn the sectional chart to match your heading.
9. Watch for prominent landmarks.
10. Match the landmarks to the sectional chart.
11. If airplane is GPS equipped. Utilize nearest airport function.
12. Find suitable Nav aids on the sectional chart.
13. Reset the heading indicator
14. Tune and identify an available VOR station.
15. Locate the aircraft position on a radial from that VOR station. Fly inbound or outbound on that radial.
16. Select another VOR station at an angle to the first.
17. Locate the aircraft position on a radial from that VOR station. Where the radials intersect is your present position.
18. Plot a course to proceed direct to the destination or to intercept the planned course as appropriate.
19. Obtain assistance from ATC or FSS. Select appropriate frequencies from your Sectional Chart. Ask ATC for a radar vector to your destination.
20. If unable to establish contact with anyone, squawk 7700 and transmit "in the blind" on 121.5 MHz to obtain assistance. Issue a "Mayday" call if necessary.
21. Carefully monitor the amount of fuel and make a precautionary landing, preferably at an airport, before exhausting the fuel supply.

VOR Radial Intercept

1. Tune the VOR frequency, verify the station's Morse code identifier, and monitor the VOR.
2. Check the Heading Indicator with the magnetic compass. Reset as necessary.
3. Turn the airplane to a heading to parallel the desired course, in the same direction as the course to be flown.
4. With the Omni Bearing Selector (OBS), center the Course Deviation Indicator (CDI) with a TO flag indication (inbound), or a FROM flag indication (outbound), as appropriate.
5. Determine the difference between the radial to be intercepted and the radial presently on.
6. Double the difference to determine the interception angle (may not be less than 20 degrees, nor more than 90 degrees).
7. Rotate the OBS to select the desired radial (From), or the course (To).

f. Retract flaps to 10 degrees above 55 KIAS

g. Retract flaps to 0 degrees above 60 KIAS

12. Resume Normal Cruise

Crossed Control Stall (Demonstration Only)

1. Select an altitude that will allow recovery no lower than 3000 AGL
2. Complete clearing turns and pre-maneuver checklist
3. Stabilize A/C (Heading, Altitude, Airspeed)
4. Reduce power to 1500 RPM
5. Do NOT extend flaps
6. Establish a stabilized descent at 75 KIAS simulating a base leg
7. Set power to idle and re-trim for 75 KIAS descent
8. Initiate a 30 degree bank in the direction of simulated final approach
9. During the turn apply excessive rudder in the direction of the turn. Hold bank constant by applying opposite aileron pressure.
10. Increase pitch attitude to induce the stall.
11. Announce "Stall" and initiate recovery
13. Recovery
 - a. Reduce pitch attitude
 - b. Smoothly add full power
 - c. Level wings
 - d. Pitch for V_x (60 KIAS) or V_y (79 KIAS) attitude depending on obstacles
 - i. Minimize altitude loss
 - e. Establish Positive Rate of Climb
14. Resume Normal Cruise

Steep Turns

1. Complete pre-maneuver CHAPS checklist
2. Select a visual reference point directly ahead of the airplane out toward the horizon (confirm with heading indicator, set heading bug if equipped)
3. Adjust the pitch and power to maintain altitude and 95 KIAS (approx. 2000-2100 RPM)
4. Roll into a 45 degree bank (private) or 50 degree bank (commercial)
5. Rolling through 30 degrees increase power 100-200 RPM, while pitching up to maintain altitude
6. Roll out 20-25 degrees before the entry heading.
7. Reduce power to maintain 95 KIAS
8. Return to wings level flight at the entry heading, altitude, and airspeed.
9. Roll into a bank in the opposite direction and repeat steps 6-10.
10. Resume Normal Cruise

Wind Drift Circle

1. Complete pre-maneuver checklist and clearing turns
2. Select a reference point in an area where an emergency landing can be made if necessary
3. Establish and maintain 100 KIAS (approx. 2100-2200 RPM) and 1000 ft AGL
4. Enter the maneuver over any reference point (usually an intersection so as to determine the wind direction more effectively)
5. Over the reference point, roll into a 30 degree bank and perform a 360 degree turn, maintaining a constant bank angle.
6. Rollout at a point where the wings will be level when completing the turn
7. Determine the approximate wind direction and speed based on any difference in position between the starting and finishing positions.
8. Resume Normal Cruise

Rectangular Course

1. Determine the wind direction
2. Complete pre-maneuver checklist and clearing turns
3. Select a square or rectangular area, or an area bounded on four sides by section lines or roads, in an area where an emergency landing can be made if necessary.
4. Establish and maintain 100 KIAS (approx. 2100-2200 RPM) and 600 to 1000 ft AGL (1000 MSL recommended to match pattern altitude in the Ormond Beach or Cecil Airport area)
5. Enter on 45 degrees to the mid-field downwind
6. Establish a crab angle as necessary to maintain a uniform distance from the area boundaries for each leg of the maneuver.
7. Begin the turn to next leg when the airplane is abeam the corner of the area boundary
8. Vary the bank angle (not to exceed 45°) to maintain a constant radius during the turns
9. Depart on a 45 degree from the downwind at the downwind turn boundary.
10. Resume Normal Cruise

Turns Around a Point

1. Determine the wind direction
2. Complete pre-maneuver checklist and clearing turns
3. Select a reference point in an area where an emergency landing can be made if necessary.
4. Establish and maintain 100 KIAS (approx. 2100-2200 RPM) and 600-1000 ft AGL (1000 MSL recommended to match pattern altitude in the Ormond Beach or Cecil Airport area)
5. Enter on a downwind to one side of the selected point at a distance equal to the desired radius of the turn.
6. Directly downwind (highest groundspeed) and abeam the reference point, roll into the steepest bank (not to exceed 45 degrees) to maintain a constant radius
7. As the turn continues (groundspeed decreases), begin to shallow the bank as necessary to continue maintain a constant radius.
8. Directly upwind (lowest groundspeed), the bank should be at its shallowest

9. As the turn continues (groundspeed increases), begin to steepen the bank as necessary to continue maintaining a constant radius.
10. Complete two complete circles, or as directed, and depart on the entry heading.
11. Resume Normal Cruise.

S Turns Across a Road

1. Determine the wind direction
2. Complete pre-maneuver checklist and clearing turns
3. Select a straight ground reference line or road in an area where an emergency landing can be made if necessary, and that lies 90 degrees (perpendicular to the direction of the wind.
4. Establish and maintain 100 KIAS (approx. 2100-2200 RPM) and 600-1000 ft AGL (1000 MSL recommended to match pattern altitude in the Ormond Beach and Cecil Airport area)
5. Enter on a downwind heading.
6. When directly over the line or road (highest groundspeed), roll into the steepest bank (not to exceed 45 degrees) to maintain a constant radius.
7. As the turn continues (groundspeed decreases) begin to shallow the bank as necessary to continue maintaining a constant radius.
8. Level the wings when crossing the reference line (lowest groundspeed) and immediately begin a turn back in the opposite direction.
9. As the turn continues (groundspeed increases), begin to steepen the bank as necessary to continue maintaining a constant radius.
10. Level the wings when crossing the reference line (highest groundspeed).
11. The rollouts must be timed in order to be straight and level directly over and perpendicular to the line or road.
12. After completing the second turn depart on the entry heading.
13. Resume Normal Cruise.

Diversion

1. Note the time.
2. Verify the airplane's present position.
3. Determine the location of the new destination.
4. Turn in the appropriate direction to an estimated heading, taking into consideration airspace, obstructions, and/or adverse weather.
5. Decide if a new altitude is necessary due to airspace, cruise altitude regulations, or obstacles is necessary
6. Determine the distance and compass heading to the new destination.
7. Turn to the compass heading.
8. Select prominent landmarks to aid in flying the new course.
9. Compute ETE (estimated time enroute), ETA (estimate time of arrival), and the fuel required to reach the new destination.
10. Contact FSS to amend your flight plan.