STANDARDIZATION

PA28-161

POWER SETTINGS FOR VARIOUS NORMAL FLIGHT OPERATIONS

AIRSPEED	FLAP SET-TING	LEVEL/ DESCENT RATE	POWER SETTING
90 KIAS	Zero	LEVEL	2250 RPM
90 KIAS	10 DEGREES	LEVEL	2300 RPM
90 KIAS	10 DEGREES	500 FPM	2000 RPM
90 KIAS	10 DEGREES	700 FPM	1700 RPM
90 KIAS	10 DEGREES	1000 FPM	1500 RPM
100 KIAS	Zero	LEVEL	2400 RPM
100 KIAS	Zero	500 FPM	2150 RPM

POWER SETTINGS LISTED ARE ONLY APPROXIMATE & WILL VARY DEPENDING ON DENSITY ALTITUDE AND OTHER CONDITIONS.

sunrise AVIATION

PA28-161
PIPER CADET & WARRIOR
Maneuvers Manual
Revised June 2020
FOR INSTRUCTIONAL USE ONLY

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. approximately 2330 RPM static full throttle (sea level ISA)
    b. All other engine instruments in the green
7. At 45-55 KIAS (as calculated per POH)
    a. Rotate to Vy (79 KIAS) attitude
8. Maintain ground track along runway and extended centerline
9. Establish cruise climb (87 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 run-way
5. Position controls for the wind
    a. Ailerons fully deflected into the wind b. Elevator neutral
6. Smoothly apply full power

Vspeeds for PA-28-161

Vspeed	KIAS
V_{SO}	44
V_S	50
V_R (Normal, 0°FLAPS)	45-55
V_R (Short, 25° FLAPS)	40-52
V_X (sea level)	63
V_Y (sea level)	79
V cruise climb	87
V_{GLIDE}	73
V_A (MAX GROSS)	111
V_{FE}	103
V_{NO}	126
V_{NE}	160
Vnormal approach (full flaps)	65
Vshort field approach (full flaps)	63
Go around (25° flaps)	55
Max. Dem. X/Wind	17
V Close Door	89
V Training Cruise	90

Maximum Gross T/O Wt
CADET: 2325 lbs.
WARRIOR: 2440 lbs.

Maximum Baggage in Baggage Area
CADET: 50 lbs.
WARRIOR: 200 lbs.

MANUFACTURERS RECOMMENDED SPEEDS LIMITS FOR MANEUVERS (See Limitations Section)

Chandelles: 111

Lazy Eights: 111

Steep Turns: 111

10. Match the landmarks to the sectional chart.
11. Find suitable Navaids on the sectional chart.
12. Reset the heading indicator
13. Tune and identify an available VOR station.
14. Locate the aircraft position on a radial from that VOR station. Fly inbound or outbound on that radial.
15. Select another VOR station at an angle (as close to 90° as possible) to the first.
16. Locate the aircraft position on a radial from the second VOR station. Where the radials intersect is your present position.
17. Plot a course to proceed direct to the destination or to intercept the planned course as appropriate.
18. Obtain assistance from ATC or FSS. Select appropriate frequencies from your Sectional Chart. Ask ATC for a radar vector to your destination.
19. If unable to establish contact with anyone, squawk 7700 and transmit "in the
blind" on 121.5 MHz to obtain assistance. Issue a "Mayday" (or "PAN PAN") call if necessary.
20. Carefully monitor the amount of fuel and make a precautionary landing, preferably at an airport, before exhausting the fuel supply.

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 training. 1000 ft maximum loss recommended.
4. Set power to idle.
5. Initiate a descent resulting in an airspeed not to exceed 126 (Vno) <or Va in turbulent conditions> with a bank angle of 30 to 45 degrees. The bank helps you increase the rate of descent while providing better visibility to clear the area below and helping to maintain positive load factors.
6. Upon completion of the maneuver, level the wings, smoothly increase the pitch, in-crease the power.
7. Resume Normal Cruise.

7. Check engine instruments
    a. approximately 2330 static full throttle (sea level ISA)
    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 45-55 KIAS (as calculated per POH)
    a. Rotate to Vy (79 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 (87 KIAS)
    a. Minimum safe altitude 500 feet AGL
13. Complete Climb Checklist

Short Field Takeoff and Climb

1. Flaps 25 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. approximately 2330 static full throttle (sea level ISA)
    b. All other engine instruments in the green
8. Release Brakes
9. At 40-52 KIAS (as calculated per POH)
    a. Rotate to Vx (63 KIAS) climb attitude
10. Accelerate until reaching and maintain 44 to 57 KIAS (as calculated per POH) until 50' AGL or obstacle clearance is achieved
11. Clear of Obstacles
    a. Lower pitch to Vy (79 KIAS) attitude

12. At a safe altitude, begin retracting flaps slowly.
    a. retract flaps to 10 degrees at or above 55 KIAS
    b. retract flaps to 0 degrees at or above 63 KIAS
13. Maintain ground track along runway and extended centerline
14. Establish cruise climb (87 KIAS)
    a. Minimum safe altitude 500 feet AGL
15. Complete Climb Checklist

Soft Field Takeoff and Climb

1. Flaps 25 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. approximately 2330 static full throttle (sea level ISA)
    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
8. At Vx (52 KIAS) if obstacles or Vy (79 KIAS)
    a. Initiate climb
10. At a safe altitude, begin retracting flaps slowly.
    a. retract flaps to 10 degrees at or above 55 KIAS
    b. retract flaps to 0 degrees at or above 63 KIAS
11. Maintain ground track along runway and extended centerline
12. Establish cruise climb (79 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

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 in bound legs
13.Report departing hold and resume speed if enroute or continue with the approach and maintain 90 KIAS
14.When instructed to leave the hold at a certain time, adjust outbound and in-bound legs so as to depart the fix at the exact time specified.

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 air-space, 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.

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. Circle to get a better view around the area to locate landmarks.
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 navaids.
6. Obtain your Sectional chart.
7. Reset the heading indicator. (note error, if any, to get an idea roughly how far of course you may be)
8. Turn the sectional chart to match your heading.
9. Watch for prominent landmarks.

a. Direct
b. Parallel
c. Tear Drop

5. Within 3 minutes of the fix, reduce power to approximately 2000 RPM
6. Airspeed 90 KIAS (Flaps zero degrees unless hold is part of the initial approach procedure)
7. When over the fix, Do the **"5 T's"**
    a. Time: note the time
    b. Turn: to the proper heading for the entry
    c. Twist: verify you have the INBOUND course properly set on the HSI or heading indicator
    d. Throttle: adjust as needed maintain 90 KIAS (approx. 2300RPM)
    e. 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 ½ 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 up	265

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

    ii. Exit 45 degrees turn in the direction of the traffic pattern or fly straight ahead – 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 (establish radio contact at least 10NM out)
2. Scan for other aircraft throughout the pattern
3. Enter 45 degrees to the downwind leg
    a. At Pattern Altitude
    b. Abeam midpoint of the runway
4. Enter Downwind Leg
    a. Maintain ½ to 1 miles distance from runway
    b. Airspeed 90 KIAS, approximately 2300 RPM
5. Maintain pattern altitude until abeam intended point of touchdown
    a. Power 1700 RPM
    b. Below 103 KIAS flaps 10 degrees
    c. Airspeed 85 KIAS
6. Turn base
    a. 45 degree angle from approach end of runway
    b. Flaps 25 degrees
    c. Airspeed 75 KIAS
7. Turn final
    a. Roll out aligned with the runway

b. Flaps 40 degrees
    c. Airspeed 70-63 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. Communicate if unsafe situation develops. Use caution when "inside" of other aircrafts downwind track.

Normal Landing

1. Prior to 300 feet AGL
    a. Flaps 40 degrees (depending on wind)
    b. Aircraft on a stabilized approach.
2. Trim for 70 KIAS
3. Final approach (40 degrees flaps) 65 KIAS
    a. Adjust speed for ½ the gust factor
        i. Winds (240 at 12 kts gusts 20 kts) gust factor 8
        ii. 65 + 4 = 69 KIAS
4. Begin round-out approximately 10-15 feet above the runway
    a. Reducing power slowly to idle
    b. Increase pitch to slow the descent
5. Just prior to touchdown increase pitch to a flared attitude (end of RWY in sight)
6. Land on the main gear
    a. Hold the nose wheel off by maintaining back pressure
7. Brake as needed

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 pre-scribed 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 to 1300 RPM
14. Set final flaps as needed when at or below 103 KIAS.
15. Complete normal landing.

Circling Approach

1. Maintain sight of the runway
2. State “RUNWAY IN SIGHT, CIRLING”
3. Follow ATC instructions for maneuvering to the base or downwind leg
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 visual range of RWY (distance appropriate to approach category)
7. Maintain circling MDA until in a position to make a normal descent to landing, power set to approximately 2300 RPM, maintain 90 KIAS with 10 degrees of flaps set.
8. When ready to descend to a landing, reduce power to 1500 RPM.
9. Set final flaps as needed when at or below 103 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

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 to 1500 RPM.
14. Set final flaps as needed when at or below 103 KIAS.
15. Complete normal landing.

No Gyro ASR Approach

1. Prior to commencing approach, complete Approach Briefing and state “APPROACH BRIEFING COMPLETE”
2. 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.
3. Course guidance will be provided by ATC
4. Reduce power to 2000-2400 RPM
5. Below 103 KIAS, set flaps 10 degrees
6. Maintain 90 KIAS
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 de-scent rate of 1000 fpm. Reduce the power by about 800 RPM (approx. 1600 RPM) and adjust pitch for 90 KIAS. 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 2400-2200 RPM, maintain 90 KIAS

Crosswind Landing

1. Prior to 300 feet AGL
    a. Flaps 40 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 on a stabilized approach
2. Trim for 70 KIAS
3. Final approach (40 degrees flaps) 65 KIAS
    a. Adjust speed for ½ the gust factor
        i. Winds (240 at 12 kts gusts 20 kts) gust factor 8
        ii. 65 + 4 = 69 KIAS
4. Use side slip technique
    a. Aileron to control drift
    b. Rudder to keep the longitudinal axis aligned with the runway
    (if there is not sufficient rudder travel to compensate for drift, go around)
5. Begin round-out approximately 10-15 feet above the runway
    a. Reducing power slowly to idle
    b. Increase pitch to slow the descent
6. Just prior to touchdown increase pitch to a flared attitude
7. 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
8. Brake as needed
9. Continue with proper crosswind correction while exiting runway and taxiing

Short Field Landing

1. Prior to 300 feet AGL
    a. Flaps 40 degrees
    b. Aircraft on a stabilized approach
2. Trim for 70 KIAS
3. Final approach (40 degrees flaps) 49 to 65 KIAS (as calculated per POH). Typically, 63 KIAS in training environment.
    a. Adjust speed for ½ the gust factor
        i. Winds (240 at 12 kts gusts 20 kts) gust factor 8
        ii. 63 + 4 = 67 KIAS
4. 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.

5. Land on the main gear
6. At touchdown maintain nose up for aerodynamic braking
    a. Retract the flaps
    b. Apply brakes as needed consistent with safety to minimize landing roll

Soft Field Landing

1. Prior to 300 feet AGL
    a. Flaps 40 degrees
    b. Aircraft on a stabilized approach
2. Trim for 70 KIAS
3. Final approach (40 degrees flaps) 65 KIAS
    a. Adjust speed for ½ the gust factor
        i. Winds (240 at 12 kts gusts 20 kts) gust factor 8
        ii. 65 + 4 = 69 KIAS
4. Begin round-out approximately 10-15 feet above the runway
5. 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
6. Land on the main gear
    a. Hold the nose wheel off as long as possible (keep end of RWY in sight)
    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
7. Avoid the use of brakes

No-Flap Landing

1. Prior to 300 feet AGL
    a. Flaps zero degrees
    b. Aircraft on a stabilized approach
    c. Use a forward slip if you need to loose altitude (expect a shallower descent angle than usual)
2. Airspeed 70 KIAS
    a. Adjust speed for ½ 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 10-15 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

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 to 1300 RPM
15. Set final flaps as needed when at or below 103 KIAS.
16. Complete normal landing.

Airport Surveillance Radar (ASR) Approach

1. Prior to commencing approach, complete Approach Briefing and state “APPROACH BRIEFING COMPLETE”
2. Follow heading and altitude instructions as given by ATC
3. Course guidance will be provided by ATC
4. Reduce power to 2300-2100 RPM
5. Below 103 KIAS, set flaps 10 degrees
6. Maintain 90 KIAS
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 de-scent rate of 1000 fpm. Reduce the power by about 800 RPM (approx. 1600 RPM) and 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 2300-2200 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.

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 localizer and glide-slope during the remaining descent.
14. Reduce power to approximately 1500 and Set Final Flaps as needed when at or below 103 KIAS.
15. Complete normal landing.

Non-Precision Approach
1. Prior to commencing approach, complete Approach Briefing and state “APPROACH BRIEFING COMPLETE”
2. Reduce power to 2300 RPM
3. Below 103 KIAS, set flaps 10 degrees
4. Maintain 90 KIAS
5. State “COURSE ALIVE” when CDI becomes active
6. At the FAF, reduce power to approximately 1500-1700 RPM and 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. 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 2300-2200 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.

Expect a higher than normal pitch attitude, keep end of RWY in sight.
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 73 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 closely on short final.
15. Do not attempt to stretch the glide by pitching up and reducing airspeed below 73 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 (Balked Landing)
1. Apply full power
2. Retract flaps to 25 degrees
3. Initiate climb at 63 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 63 KIAS and clear of obstacles, flaps to zero
7. Pitch for airspeed Vy (79 KIAS)

Emergency Approach and Landing

1. Establish Best Glide (73 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 (surface, slope, power lines, body of water, etc)
3. Complete Engine Failure Checklist
4. Distress call (if time permits-position, souls on board, altitude)
    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, 70 KIAS flaps up or 63 KIAS flaps 40°
10. Unlatch door for evacuation after landing
11. Complete power off landing checklist

Transfer of Flight Controls

1. Pilot Flying (PF) Transfers to (PNF)
    a. PF “You have the flight controls”
    b. PNF “I have the flight controls”
    c. Old PF “You have the flight controls”
    d. Relinquish the Controls
2. Who the PF is, should never be in doubt
3. A visual check should be made to ensure that the transfer was successful.

5. Complete course reversal within published limit (usually 10 nm)
    a. Use course reversal depicted on the chart
    b. When timing outbound using 1 to 2 minutes prior to starting course reversal is usually adequate at these speeds
6. Set OBS to inbound course
7. Intercept inbound course and descend as required (cleared or published). Continue to maintain 90 KIAS.

Precision Approach

1. Prior to commencing approach, complete Approach Briefing and state “APPROACH BRIEFING COMPLETE”
2. Reduce power to 2300 RPM
3. Below 103 KIAS, set flaps 10 degrees
4. Maintain 90 KIAS
5. State “LOCALIZER ALIVE” when CDI becomes active
6. State “GLIDE-SLOPE ALIVE” when glide-slope becomes active
7. At the FAF (glide slope intercept) reduce power by approximately 300-400 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, depending on actual GROUNDSPEED.
    a. Verify the correct altitude of the glide-slope at the LOM or other appropriate way-point
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”

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 identified.
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 frequency and initial course in #2 NAV unless needed for the instrument approach .
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. Reduce power to approximately 2300 RPM
    b. Set flaps to 10 degrees (below 103 KIAS)
    c. Maintain 90 KIAS
    d. Trim for 90 KIAS
3. Complete Descent Checklist

Approaches with Course Reversal (Full Approaches)

1. Complete "Approach Briefing"
2. At the IAF, do the 5 T's
    a. Time: note the time
    b. Turn: to track the outbound course
    c. Twist: set the OBS to the course
    d. Throttle: reduce power to approximately 2300-2100 rpm, below 103 KIAS set flaps 10 degrees (if required), maintain 90 KIAS, trim for 90 KIAS.
3. Begin descent to initial approach altitude as required (cleared or published).
4. Compete Descent Checklist

Pre-Maneuver Check/Clearing Turns

1. Identify a suitable emergency landing site
2. Altitude - no lower than 2000 feet AGL recommended. Hard floor=1500 AGL.
3. Perform clearing turns through 90° to the Left and Right preferred
    a. Visually clear area Left and Right before turning
    b. Begin medium bank turn
    c. Scan for traffic (above, below, ahead of flight path)
4. Electric Fuel Pump—**ON**
5. Fuel Selector valve – on fullest tank
6. Mixture – RICH if maneuver requires full power
7. Throttle Set – 1500 RPM to 2300 RPM depending upon maneuver

Slow Flight Clean Configuration

1. Slow flight will be completed no lower than 1500 feet AGL
2. Complete pre-maneuver checklist and clearing turns
3. Stabilize aircraft (Heading, Altitude, Airspeed)
4. Reduce Power to 1500 RPM
5. Adjust pitch to maintain altitude
6. As airspeed slows to MCA (V_{SI} 50 KIAS)
    a. Increase power (approx. 1900 RPM)
    b. Make small pitch, bank, and power changes
7. Maneuvering at MCA
    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 checklist and clearing turns
3. Stabilize aircraft (Heading, Altitude, Airspeed)
4. Reduce Power to 1500 RPM
5. Adjust pitch to maintain altitude
6. Below 103 KIAS add flaps as directed

7. As airspeed slows to MCA (Vso 44 KIAS)
    a. Increase power (approx. 2100 RPM)
    b. Make small pitch, bank, and power changes
8. Maneuvering at MCA
    a. Straight and Level
    b. Turns (30 degree bank max)
    c. Climbs and descents
9. Recovery
    a. Smoothly add full power
    b. Adjust pitch to maintain altitude
    c. Retract flaps to 25 degrees
    d. Retract flaps to 10 degrees at or above 55 KIAS
    e. Retract flaps to 0 degrees at or above 63 KIAS
10. Resume Normal Cruise

Stalls Clean Configuration – Power ON

1. All stalls will be completed no lower than 1500 feet AGL
2. Complete pre-maneuver checklist and clearing turns
3. Stabilize aircraft (Heading, Altitude, Airspeed)
4. Reduce Power to 1500 RPM
5. Adjust pitch to maintain altitude
6. As airspeed approaches liftoff speed (approx. 60 KIAS)
    a. Smoothly add full power
    b. Maintain coordinated flight with rudder (use caution to avoid spin!)
    c. Slowly increase pitch attitude
7. Announce "Stall" and initiate recovery at the occurrence of one of the following:
    a. "Onset" Stall Conditions (Commercial)
        i. The first buffet, or rapid decay of control effectiveness
    b. Full Stall (Private)
        i. A sudden loss of control effectiveness occurs, excessive sink rate, or sudden nose pitch down with full up elevator is experienced
8. Recovery
    a. Reduce pitch attitude
    b. Level wings
    c. Pitch for Vx (63 KIAS) or Vy (79 KIAS) attitude depending on obstacles

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.

Magnetic Compass Turns (VDMONA)

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.
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. (bank vs. airspeed)
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.

7. Rotate the OBS to select the desired radial (From), or the course (To).
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.

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.
        i. Minimize altitude loss
        ii. Establish Positive Rate of Climb
        iii. Return to ALT, HDG, AS as specified
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 checklist and clearing turns
3. Stabilize A/C (Heading, Altitude, Airspeed)
4. Reduce Power to 1500 RPM
5. Adjust pitch to maintain altitude
6. Below 103 KIAS extend flaps to 40 degrees (or as specified)
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
    d. Maintain coordinated flight with rudder (use caution to avoid spin)
8. Announce "Stall" and initiate recovery at the occurrence of one of the following:
    a. "Onset" Stall Conditions (Commercial)
        i. The first buffet, or rapid decay of control effectiveness
    b. Full Stall (Private)
        i. A sudden loss of control effectiveness occurs, excessive sink rate, or sudden nose pitch down with full up elevator is experienced
9. Recovery
    a. Reduce pitch attitude
    b. Smoothly add full power
    c. Level wings
    d. Pitch for Vx (63 KIAS) or Vy (79 KIAS) attitude depending on obstacles
        i. Minimize altitude loss
    e. Retract flaps to 25 degrees immediately
    f. Establish Positive Rate of Climb and 63 KIAS
    g. Retract flaps to 10 degrees
    h. Retract flaps to 0 degrees
        i. Return to ALT, HDG, AS as specified
10. Resume Normal Cruise

Accelerated Stall (DUAL Demonstration or Commercial)

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. At airspeed approaches 90 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 ONSET "Stall" conditions
10. Recovery
    a. Reduce pitch attitude
    b. Smoothly add full power
    c. Level wings
    d. Pitch for Vx (63 KIAS) or Vy (79 KIAS) attitude depending on obstacles
        i. Minimize altitude loss
        ii. Establish Positive Rate of Climb
11. Resume Normal Cruise

Secondary Stall (DUAL 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 103 KIAS extend flaps in increments to 40 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 after the occurrence of one of the following:
    a. "Onset" Stall Conditions
        i. The first buffet, or rapid decay of control effectiveness

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. In no wind or light wind conditions use 885 feet plus the elevation or around 1000 MSL around Cecil Airport.
5. Enter on a 45 degree angle to downwind and at 90 KIAS 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 ground-speed 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 (45°to downwind).
15. Resume Normal Cruise.

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. As the turn continues (groundspeed decreases), begin to shallow the bank as necessary to 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 90 KIAS (approx 2300 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 maintain 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.

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.

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 to about a level attitude.
10. Immediately increase pitch attitude by adding excessive back pressure to induce an other (secondary) stall.
11. Announce “Stall” and initiate recovery
13. Recovery
    a. Reduce pitch attitude
    b. Smoothly add apply full power
    c. Level wings
    d. Pitch for Vx (63 KIAS) or Vy (79 KIAS) attitude depending on obstacles
        i. Minimize altitude loss
    f. Establish Positive Rate of Climb and 63 KIAS
    g. Retract flaps to 10 degrees
    h. Retract flaps to 0 degrees
12. Resume Normal Cruise

Elevator Trim Stall (DUAL 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 103 KIAS extend flaps in increments to 40 degrees
7. As airspeed approaches 65 KIAS
    a. Reduce power to idle
    b. Lower pitch, establish glide at 65 KIAS
    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. “Onset” Stall Condition 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 Vx (63 KIAS) or Vy (79 KIAS) attitude depending on obstacles
        i. Minimize altitude loss
    d. Establish Positive Rate of Climb and 63 KIAS
    e. Retract flaps to 10 degrees
    f. Retract flaps to 0 degrees
    g. Re-adjust TRIM to relieve heavy control pressure
12. Resume Normal Cruise

Crossed Control Stall (DUAL 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 1200 RPM
5. Do **NOT** extend flaps
6. Establish a stabilized descent at 80 KIAS simulating a base leg
7. Set power to idle and re-trim for 70 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 Vx (63 KIAS) or Vy (79 KIAS) attitude depending on obstacles
        i. Minimize altitude loss
    e. Establish Positive Rate of Climb
14. Resume Normal Cruise

3. Establish and maintain 90 KIAS (approx 2300 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 90 KIAS (approx 2300 RPM) and 600-1000 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 90 KIAS (approx 2300 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.

4. Pick reference points at 45°, off the wing tip (90°) and at 135° 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 (repeat points 5-8)
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 approximately and establish a glide at 83 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 ABOVE 1500’ and accelerate to normal cruise speed.

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

Steep Turns

1. Complete pre-maneuver checklist and clearing turns
2. Select a visual reference point directly ahead of the airplane out toward the horizon (confirm with heading indicator)
3. Adjust the pitch and power to maintain altitude and 90 KIAS (approx. 2300 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 and airspeed
6. Roll out 20-25 degrees before the entry heading (1/2 bank angle).
7. Reduce power to maintain 90 KIAS
8. Return to wings level flight at the same heading, altitude, and airspeed you had at maneuver entry.
9. Roll into a bank in the opposite direction and repeat steps 6-8.
10. Resume Normal Cruise

Chandelles

1. Complete pre-maneuver checklist and clearing turns
2. Set Power to approximately 2300. Airspeed: 90 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. Add full power.
7. Simultaneously, smoothly and constantly increase pitch to reach 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 just above stall speed and maintain that airspeed momentarily, avoiding a stall.
11. Upon reaching the 180 degree position, maintain altitude and accelerate to normal cruise speed. Resume straight and level flight with minimum loss of altitude.

Lazy Eights

1. Complete pre-maneuver checklist and clearing turns
2. Set Power to approximately 2300. Airspeed: 90 KIAS.
3. Mixture can remain leaned.