Cessna 172/C-172 2014

The following maneuvers are set forth only as a guide to the student and the instructor on how to teach and in what order to perform steps while executing the maneuvers. They serve to standardize the maneuvers, which in turn aids students in transitioning between instructors as well as aiding check instructors during progress, and stage checks. Small differences will always occur between instructors and students, however these procedures should be adhered to as closely as possible. In all cases, the appropriate checklists shall be used when warranted. Refer to the Airplane Flying Handbook (AFH) or the Pilots Operating Handbook (POH) for more details.

**Airspeeds and Limitations**

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<tr>
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<td>( V_{S} )</td>
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<td>44 KIAS</td>
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<tr>
<td>( V_{X} )</td>
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<td>60 KIAS</td>
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<tr>
<td>( V_{Y} )</td>
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<td>79 KIAS</td>
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<td>( V_{A} ) (Max. Weight)</td>
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<td>( V_{FE} )</td>
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<tr>
<td>( V_{NO} )</td>
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<td>( V_{NE} )</td>
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<td>Best Glide</td>
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<td>Cruise Climb</td>
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<tr>
<td>Final Approach</td>
<td>70 KIAS</td>
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**Altitude**

Maneuver must be completed above this altitude.

**Clearing Turns**

Complete a 90° turn to the left followed by a 90° turn to the right. (At least 180° of turning.

**Desired Heading**

This is the Direction of the Entry of the Maneuver.

**Flow Pattern**

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<tr>
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<tr>
<td>Magnetos</td>
<td>Both</td>
<td>Both</td>
</tr>
<tr>
<td>Seat Belts</td>
<td>Secure</td>
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**Slow Flight & Stalls**

**Slow Flight (Landing Configuration)**

1. Altitude ............... Above 1500’ AGL
2. Flow Pattern .......... Complete
3. Clearing Turns ........ Complete
4. Desired Heading....... Pilot’s discretion
5. Power .................... 1500 RPM
6. Flaps ..................... Extend one notch at a time to full once in the white arc
7. Altitude ............... Maintain (+/- 100 Ft. for Private or +/- 50 Ft. for Commercial)
8. Airspeed ............... \( V_{SO} \) (+10/-0 Knots For Private or +5/-0 Knots for Commercial)
9. Power .................... Increase As Required
10. Heading ............... Maintain (+/- 10°)
    **Recovery**
11. Power .................... Increase Gradually
12. Altitude ............... Maintain
13. Heading ............... Maintain
14. Flaps ..................... Retract (One notch at a time)
Slow Flight (Departure Configuration)
1. Altitude .................... Above 1500’ AGL
2. Flow Pattern ............ Complete
3. Clearing Turns .......... Complete
4. Desired Heading ...... Pilot’s Discretion
5. Power ..................... 1500 RPM
6. Altitude ................... Maintain (+/- 100 Ft. for Private or +/- 50 Ft. for Commercial)
7. Airspeed ................. $V_S$ (+10/-0 Knots For Private or +5/-0 Knots for Commercial)
8. Power ..................... Increase As Required
9. Heading ................... Maintain (+/- $10^\circ$)

Recovery
10. Power ..................... Increase Gradually
11. Altitude .................... Maintain
12. Heading .................... Maintain

Power-Off Stall (Approach to Landing)
1. Altitude .................... Above 1500’ AGL
2. Flow Pattern ............ Complete
3. Clearing Turns .......... Complete
4. Desired Heading ...... Pilot’s Discretion
5. Power ..................... 1500 RPM
6. Flaps ...................... Extend one notch at a time to full once in the white arc
7. Heading ................... Maintain (+/- $10^\circ$)
8. Airspeed ................. 70 Knots and 500 FPM Descent Rate
9. Power ..................... Reduce to Idle
10. Pitch ...................... As required to induce a stall

Recovery
11. Recognize and Announce Stall
12. Reduce Pitch, Increase Power to Full, and Level Wings
13. Flaps ...................... Retract 1st notch immediately
14. Pitch ..................... $V_X$
15. Flaps ...................... Retract 2nd notch when VSI indicates a climb
16. Pitch ..................... $V_Y$
17. Flaps ...................... Retract 3rd notch when VSI indicates a climb
Power-On Stall (Takeoff or Departure)
A Power-on stall can be accomplished as either a takeoff or a departure stall. A takeoff stall shall be performed with the aircraft configured as it would be in the takeoff configuration. A departure stall shall be performed in the clean configuration. Both are appropriate and both should be taught to the student. During progress checks, stage checks or checkrides, it shall be at the examiner’s discretion as to the configuration to be used.

1. Altitude ................... Above 1500’ AGL
2. Flow Pattern .......... Complete
3. Clearing Turns ........ Complete
4. Desired Heading ...... Pilot’s Discretion
5. Power .................... 1500 RPM
6. Flaps ..................... Extend to Takeoff or Departure configuration in the white arc
7. Heading .................. Maintain (+/- 10°)
8. Airspeed ................. 70 Knots
9. Power ..................... Increase to Full
10. Pitch ..................... As required to induce a stall

**Recovery**
11. Recognize and Announce Stall
12. Reduce Pitch, Increase Power to Full, and Level Wings
13. Pitch .................V_x
14. Flaps .................. Retract 1st notch when VSI indicates a climb (if down)
15. Pitch .................. V_y

**Accelerated Stall**
1. Altitude .................. Above 3000’ AGL
2. Clearing Turns ......... Complete
3. Desired Heading ...... Pilot’s Discretion
4. Power ..................... 1800 RPM
5. Airspeed ................. 80 Knots
6. Bank ..................... Roll into 45° to 50° bank
7. Pitch ..................... As required to maintain level flight

**Recovery**
8. Recognize and Announce Stall
9. Reduce Pitch, Increase Power, Level Wings
**Ground Reference Maneuvers (Private)**

**S-Turns Across a Road**
Select a road with a suitable emergency landing area

1. Altitude .................. 1000’ AGL
2. Flow Pattern........... Complete
3. Clearing Turns ........... Complete
4. Desired Heading....... Downwind
5. Power ...................... 2300 RPM
6. Airspeed .................. Stabilized @ or Below Vₐ
7. Altitude .................. Maintain (+/- 100 ft)
8. Airspeed .................. Maintain (+/- 10 Knots)

The maneuver starts when airplane is perpendicular with the road

9. Bank....................... Roll into Steep Bank ( ~ 25° - 30°)
   At the 45° point (of the 180° turn)
10. Bank..................... Gradually decrease bank to a Medium Bank turn ( ~ 20° - 30°)
   Crab into the Wind
    At the 135° point (of the 180°)

The airplane must be perpendicular to the road when crossing back over it. (This should not be accomplished prior to the road)

11. Bank..................... Gradually decrease bank to a Shallow Bank turn ( ~ 0° - 20°)
    At the 180° point (of the 180°)

12. Bank..................... Gradually increase bank to a Medium Bank turn ( ~ 20° - 30°)
    Crab into the Wind
    At the 225° point (of the 180° turn)

13. Bank..................... Gradually increase bank to a Steep Bank ( ~ 25° - 30°)

The airplane must be perpendicular to the road when crossing back over it. (This should not be accomplished prior to the road)

At this point the maneuver may be repeated or you can return to straight and level flight

The bank angle is only a recommended bank angle. The actual angle of bank will depend on wind direction and speed.

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**Turns Around a Point**
Select a point with a suitable emergency landing area

1. Altitude .................. 1000’ AGL
2. Flow Pattern........... Complete
3. Clearing Turns ........... Complete
4. Desired Heading....... Downwind
5. Power ...................... 2300 RPM
6. Airspeed .................. Stabilized @ or Below Vₐ
7. Altitude .................. Maintain (+/- 100 ft)
8. Airspeed .................. Maintain (+/- 10 Knots)

The maneuver starts when airplane is perpendicular with the reference point

9. Bank....................... Roll into Steep Bank ( ~ 25° - 30°)
   At the 45° point (of the 360° turn)
10. Bank..................... Gradually decrease bank to a Medium Bank turn ( ~ 20° - 30°)
    Crab into the Wind
    At the 135° point (of the 360°)

11. Bank..................... Gradually decrease bank to a Shallow Bank turn ( ~ 0° - 20°)
    At the 180° point (of the 360°)
12. Bank..................... Gradually increase bank to a Shallow Bank turn ( ~ 0° - 20°)
    At the 225° point (of the 180° turn)

13. Bank..................... Gradually increase bank to a Medium Bank turn ( ~ 20° - 30°)

The airplane must be perpendicular to the road when crossing back over it. (This should not be accomplished prior to the road)

At this point the maneuver may be repeated or you can return to straight and level flight.

The bank angle is only a recommended bank angle. The actual angle of bank will depend on wind direction and speed.
**Rectangular Course**
Select a course with a suitable emergency landing area
1. Altitude ................. 1000’ AGL
2. Flow Pattern............ Complete
3. Clearing Turns .......... Complete
4. Desired Heading....... Downwind
5. Power.................. 2300 RPM
6. Altitude ................ Maintain (+/- 100ft.)
7. Airspeed ................. Maintain (+/- 10 Knots)
The maneuver should be entered on a 45° angle to the downwind leg. 
*Downwind to Base- Crab as required to maintain desired flight path over the ground*

8. Bank....................Roll into a Steeper Bank (~ 25°-30°) and as the turn progresses reduce the bank angle as needed
*Base to Final- Crab as required to maintain desired flight path over the ground*

9. Bank....................Roll into a Medium Bank (~ 15°- 25°) and as the turn Progresses reduce the bank angle as needed
*Final to Crosswind- Crab as required to maintain desired flight path over the ground*

10. Bank....................Roll into a Shallow Bank (~5°- 15°) and as the turn Progresses increase the bank angle as needed
*Crosswind to Downwind- Crab as required to maintain desired flight path over the ground*

11. Bank...................... Roll into a Medium Bank (~15°-25°) and as the turn Progresses increase the bank angle as needed

Rectangular course can be performed in many different configurations. The flight instructor prior to commencing the maneuver will decide these configurations.
The bank angle is only a recommended bank angle. The actual angle of bank will depend on wind direction and speed.
Takeoff

Normal Takeoff
1. Flaps .................... 0°
2. Power .................... Full
3. Lift Off .................... ~60 Knots
4. Climb .................... $V_Y$ (+10/-5 Knots for Private or +5/-5 Knots for Commercial)

Short-Field Takeoff
1. Flaps .................... 10°
2. Brakes .................... Hold
3. Power .................... Full
   check engine gauges
4. Brakes .................... Release
5. Lift Off .................... ~55 Knots
6. Climb .................... $V_X$ to 50’ or obstacle clearance (+10/-5 Knots for Private or +5/-5 Knots for Commercial)
7. Flaps .................... Retract at 100’ AGL or obstacle clearance
8. Accelerate ................ $V_Y$ (+10/-5 Knots for Private or +5/-5 Knots)

Soft-Field Takeoff
1. Flaps .................... 10°
2. Power .................... Full
3. Control Yoke ............ Full Back*
4. Lift Off .................... At slowest possible airspeed
5. Climb .................... Stay in ground effect until $V_X$ is attained
6. Flaps .................... Retract at 100’ AGL or obstacle clearance
7. Accelerate ................ $V_Y$ (+10/-5 Knots or +5/-5 Knots for Commercial)
   *During soft-field operations in the Cessna 172, sufficiently high angles of attack may be achieved during the takeoff roll which may result in the tail striking the runway surface. Care must be practiced to not allow this situation to occur.

Crosswind Takeoff
1. Flaps .................... 0°
2. Control Yoke ............ Fully into wind
3. Power .................... Full
4. Control Yoke ............ Gradually decrease deflection as airspeed increases so as to no deflection at rotation
6. Climb .................... $V_Y$ (+10/-5 Knots for Private or +5/-5 Knots for Commercial)
Landing

**Normal and Crosswind Landing**

1. The pattern should be flown 1 mile from the airport. The student should enter the pattern at 90 knots.
2. Maintain a crab angle for the wind and trim for airspeed and perform Flow Pattern.
3. Abeam the numbers first reduce the power to establish descent, then extend 1st notch of flaps, and trim.
4. At 1 mile from the end of the runway, turn base and maintain 80 knots, and extend the 2nd notch of flaps.
5. Turn final to align airplane with the runway, maintain 70 knots (apply gust factor for crosswind and gusts) and extend 3rd notch of flaps, establish a slip for the wind correction.
6. On short final begin to reduce the power; power should be at idle before they begin to flare.
7. Touchdown in a full stall with the ailerons into the wind.

**Downwind**

1. Airspeed…………… 90 Knots
2. Power………………. Reduce to ~1700 RPM (This will change with temperature)
3. Flaps………………. 10°
   Base (~ 1 mile from the end of the runway)
4. Airspeed…………… 80 Knots
5. Power………………. Adjust as necessary
6. Flaps……………….. 20° - caution- extend only below 85 knots

**Final**

7. Airspeed…………… 70 Knots
8. Power………………. Adjust as necessary
9. Flaps………………... 30°
10. Airspeed…………… 65 Knots on short final (Normal Landing only)

**Short-Field Landing**

1. Everything in a short field should be the same as a normal landing until short final.
2. Approach speed should be as published in the POH. (~ 65 Knots)
3. Maintain a constant angle of descent down to the touch down point. (Do not pick a point ahead of the touchdown point and flare to it)
4. If an obstacle needs to be cleared the angle of descent should be made to clear the obstacle. (The obstacle should be no more then 50 feet high)
5. On short final begin to decelerate to a full stall landing, which should be at the runway.
6. Use maximum braking.
   Airplane must touch down beyond 200 feet (Private) or 100 feet (Commercial) of the specified point.

Although it will be necessary to use maximum braking on an actual short-field landing or for an emergency landing, *simulated* maximum braking shall be used for practice short-field landings in an effort to prevent excessive wear on brakes.

**Downwind**

1. Airspeed…………… 90 Knots
2. Power………………. Reduce to ~1700 RPM (This will change with temperature)
3. Flaps………………. 10°
   Base (~ 1 mile from the end of the runway)
4. Airspeed…………… 80 Knots
5. Power………………. Adjust as necessary
6. Flaps……………….. 20° - caution- extend only below 85 knots

**Final**

7. Airspeed…………… ~ 65 Knots
8. Power………………. Adjust as necessary
9. Flaps………………... 30°
**Soft-Field Landing**

1. Everything in a soft field should be the same as a normal landing until the flare.
2. Just prior to the main wheels touchdown a small amount of power (~100-200 RPM) may be added in to soften the landing and keep the nose from touching down to early.
3. The airplane should touchdown at its lowest possible airspeed.
4. As the speed of the airplane slows down on the ground the control yoke should be gradually increased to full back, so the airplanes nose wheel will not touch down until the slowest possible speed.
5. Once the nose wheel touches down keep the control yoke full back, and do not use brakes unless it is necessary. Apply aileron correction as necessary for x-wind.

**Downwind**

1. Airspeed……………. 90 Knots
2. Power…………….. Reduce to ~1700 RPM (This will change with temperature)
3. Flaps…………….. 10°
   - Base (~ 1 mile from the end of the runway)
4. Airspeed……………. 80 Knots
5. Power…………….. Adjust as necessary
6. Flaps…………….. 20°– caution- extend only below 85 knots

**Final**

7. Airspeed……………. 70 Knots
8. Power…………….. Adjust as necessary
9. Flaps…………….. 30°
10. Airspeed…………….. 65 Knots on short final

During soft-field operations in the Cessna 172, sufficiently high angles of attack may be achieved during the landing roll which may result in the tail striking the runway surface. Care must be practiced to not allow this situation to occur.

**Go-Around**

1. Power…………….. Full
2. Flaps…………….. Retract first notch immediately
   - Airplane should be leveled off until $V_X$ is obtained
3. Climb ………………… $V_X$ to 100’ or obstacle clearance
4. Flaps…………….. Retract 2nd notch when VSI indicates a climb and 100’
5. Pitch…………….. $V_Y$
6. Flaps…………….. Retract 3rd notch when VSI indicates a climb and 200’
   - If an obstacle needs to be cleared the 2nd notch of flaps should be retracted when cleared of the obstacle and the 3rd notch of flaps should be retracted at 200’

**Performance Maneuvers**

**Steep Turns**

1. Altitude……………. Above 1500’ AGL
2. Flow Pattern………. Complete
3. Clearing Turns …….. Complete
4. Desired Heading…… Pilot’s Discretion
5. Power…………….. 2300 RPM
6. Airspeed…………….. Stabilized @ or Below $V_A$ (~100 KIAS)
7. Bank……………….. As Required (45° for Private or 50° for Commercial) (+/- 5°)
8. Power…………….. Increase to Maintain Airspeed
9. Altitude…………… Maintain (+/- 100 Ft.)
10. Airspeed…………… Maintain (+/- 10 Knots)
11. Roll Out…………… On Specified Heading (+/- 10°)
12. Power…………….. 2300 RPM
13. Repeat in Opposite Direction (if desired)
**Emergency**

**Emergency Descent**
1. Flow Pattern .............. Complete
2. Clearing Turns ....... Complete
3. Power ...................... Idle
4. Flaps ...................... Extend to Full when in the White Arc
5. Bank ...................... 45-50°
6. Pitch ...................... $V_{FE}$

**Commercial Maneuvers**

**Chandelles**
1. Altitude .................. 1500’ AGL
2. Flow Pattern ............ Complete
3. Clearing Turns .......... Complete
4. Desired Heading ...... Crosswind (Turn should be made towards the crosswind)
5. Power ..................... 2300 RPM
6. Power ..................... Full
7. Bank Angle .............. 30°
8. Pitch ...................... Gradually pitch up so the plane is max Pitch up at the 90° Point
9. Bank ...................... At the 90° Point gradually roll out the bank so the plane is 0° Bank at the 180° Point
10. Pitch ..................... Maintain constant after 90° Point
11. Airspeed ............... +5 KIAS of $V_S$ at the 180° Point
12. Altitude ................ Maintain Final Altitude with Minimum Altitude Loss
13. Heading .............. Maintain (+/- 10°)

**Lazy Eights**
1. Altitude ............... 1500’ AGL
2. Flow Pattern .......... Complete
3. Clearing Turns ....... Complete
4. Desired Heading ...... Pilot’s Discretion
5. Power .................. 2300 RPM
6. Bank .................. Gradually Roll in so the plane is 15° Bank at the 45° Point
7. Pitch .................. Gradually Pitch Up until 45° Point
8. Bank .................. Gradually Roll Into 30° when at the 45° Point
9. 90° Point .......... 30° Bank, Level Pitch
10. Bank .................. Gradually Roll out so the plane is 15° at the 135° Point
11. Pitch .................. Gradually Pitch Down until the 135° Point
12. Bank .................. Gradually Roll out so the plane is 0° at the 180° Point
13. 180° Point .......... Return To Straight And Level
14. Repeat In Opposite Direction

Tolerance @ each 180° Point for Altitude is +/- 100ft., Airspeed is +/- 10 Knots, and Heading is +/- 10°
**Eights-on-Pylons**
Select a course with a suitable emergency landing area
1. **Altitude** ....................... Pivotal Altitude (no lower than 500’ AGL)
2. **Flow Pattern** ............ Complete
3. **Clearing Turns** ............. Complete
4. **Desired Heading** ....... Downwind
5. **Power** .......................... 2300 RPM
6. Pick 2 pylons ~ 1 mile apart from each other (The pylons should allow straight and level flight between the pylons for approximately 3 to 5 seconds)
7. Enter downwind on a 45° angle to the 1st pylon
8. Maintain the reference point by circling the pylon and adjusting for the pivotal altitude
9. Repeat around the 2nd pylon

**Steep Spiral**
1. **Altitude** ....................... Adequate to allow for 3-360° power-off turns (~4000 Ft. AGL)
2. **Flow Pattern** ............ Complete
3. **Clearing Turns** ............. Complete
4. **Desired Heading** ....... Downwind
5. **Power** .......................... Idle
6. **Airspeed** ................. Best glide (+/- 10 Knots)
7. **Bank Angle** ........... Wind drift correction to maintain constant radius (no more than 60° bank)
8. **Power** ....................... Increase to recover by 1500 feet AGL after 3 rotations
   Engine should be cleared out approximately every 15 seconds by advancing the throttle and then returning it to idle

Steep Spirals may only be made over unpopulated areas and must terminate by 1500 feet AGL. Additionally, steep spirals may not be continued to a landing but must terminate in a go-around.

**180° Power-Off Approach**
1. **Altitude** ....................... No greater than 1000’ AGL
2. **Flow Pattern** ............ Complete
   Enter maneuver on the downwind leg
3. **Power** .......................... Idle (abeam the numbers)
4. **Airspeed** ................. Best glide
5. **Flaps** .......................... Extend when landing assured
   Airplane must touch down within the first 200 feet beyond the specified point

180° Power-Off Approaches must be conducted at an airport and may only be conducted after a normal traffic pattern and all appropriate checklists have been completed.