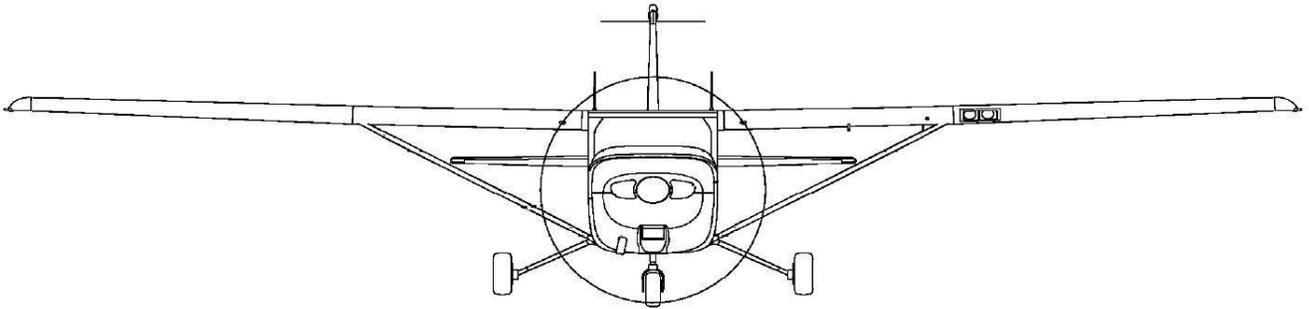


CESSNA 172-SP

PRIVATE & COMMERCIAL COURSE



University of Dubuque

Table of Contents

<u>Callouts</u>	3
<u>V-Speeds C172-SP</u>	4
<u>Normal and Crosswind Takeoff and Climb</u>	5
<u>Soft Field Takeoff and Climb</u>	8
<u>Short-Field Takeoff and Maximum Performance Climb</u>	11
<u>Traffic Pattern</u>	14
<u>Normal and Crosswind Approach and Landing</u>	15
<u>Soft-Field Approach and Landing</u>	16
<u>Short-Field Approach and Landing</u>	17
<u>Power-Off 180 Accuracy Approach and Landing</u>	18
<u>Go-Around / Rejected Landing</u>	19
<u>Steep Turns</u>	22
<u>Steep Spiral</u>	23
<u>Chandelles</u>	24
<u>Lazy Eights</u>	26
<u>Eights on Pylons</u>	28
<u>Rectangle Pattern</u>	30
<u>S-Turns Across a Road</u>	32
<u>Turns Around a Point</u>	34



Cessna 172-SP

Private & Commercial Courses

08/10/2016

Table of Contents Cont.

<u>Maneuvering During Slow Flight</u>	36
<u>Power-Off Stalls</u>	37
<u>Power-On Stalls</u>	38
<u>Accelerated Stalls</u>	39
<u>Emergency Descents</u>	40
<u>Emergency Approach and Landing</u>	41

CALLOUTS

CONDITION	CALLOUT
Parking Brake Released	CLEAR LEFT, CLEAR RIGHT, PARKING BRAKE RELEASED
After Takeoff Power has been Set	POWER STABLE, GAUGES GREEN
Airspeed Indicator is Increasing	AIRSPEED ALIVE
Airspeed Reaches V_R	ROTATE
Positive Rate of Climb After Takeoff	POSITIVE RATE
1,000 Feet From Assigned Altitude	1,000 FEET
200 Feet From Assigned Altitude	200 FEET
Any Flap Change	BELOW (## knots), FLAPS (##⁰), TARGET (## knots)
Turning Final	FINAL CLEAR

V-SPEEDS C172-SP

References:

POH C172-SP

Speeds:

Rotation (Normal)	55 KIAS
Rotation (Short Field MTOW)	51 KIAS
V_X Best Angle of Climb	62 KIAS
V_Y Best Rate of Climb	74 KIAS
V_A Maneuvering Speed (2550)	105 KIAS
V_A Maneuvering Speed (1900)	90 KIAS
Practice Maneuvering Speed	95 KIAS
V_{NE} Never Exceed	163 KIAS
V_{NO} Maximum Structural Cruising	129 KIAS
V_{FE} Maximum Flaps Extended (10°)	110 KIAS
V_{FE} Maximum Flaps Extended (>10°)	85 KIAS
V_{S1} Stall (Clean)	48 KIAS
V_{SO} Stall (Flaps Down)	40 KIAS
Final Approach (Normal)	65 KIAS
Final Approach (Short Field MLW)	61 KIAS
Best Glide (MTOW)	68 KIAS
Demonstrated Crosswind Component (20-30° Flaps).....	15 Knots
Demonstrated Crosswind Component (0-10° Flaps).....	20 Knots

NORMAL AND CROSSWIND TAKEOFF AND CLIMB

References:

Airplane Flying Handbook, POH C172-SP, Private ACS& Commercial PTS

Description:

The common takeoff technique when the runway is firm and of sufficient length to permit the airplane to gradually accelerate to normal lift-off and climb-out speed, and there are no obstructions along the takeoff path.

Objective:

Develop the skills necessary to perform normal and crosswind takeoffs.

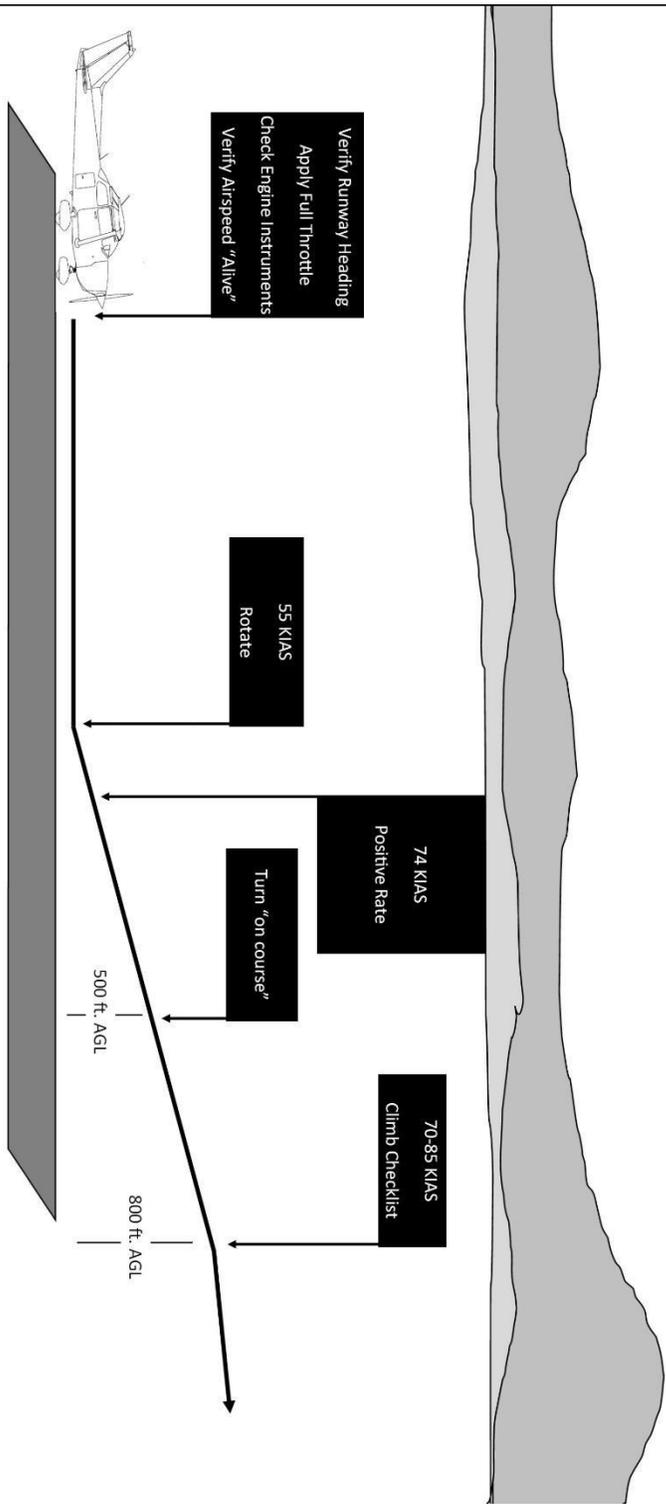
Procedure:

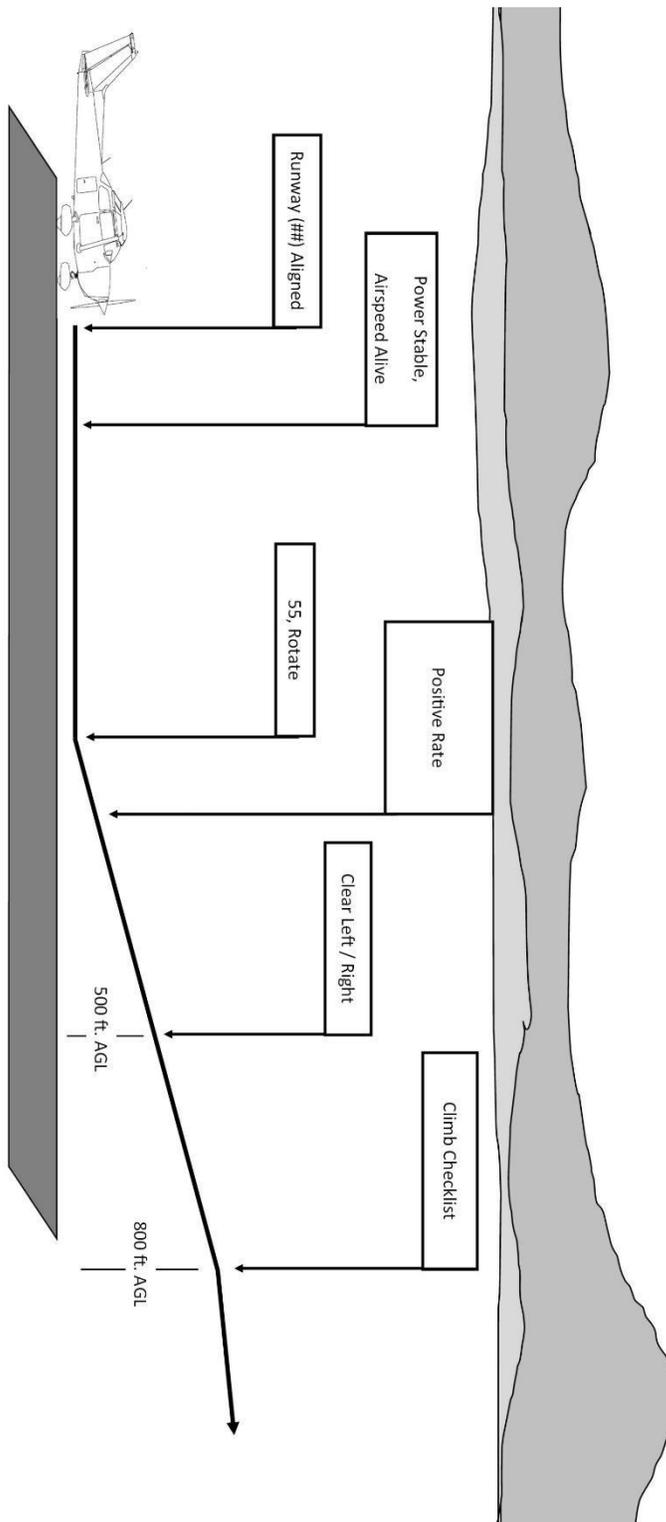
- 1 > Taxi the airplane onto the runway centerline
- 2 > Ensure the aircraft heading matches the charted runway heading
- 3 > Apply proper crosswind correction with the ailerons
- 4 > Smoothly apply full throttle
- 5 > Verify that the engine instruments all indicate in the normal range
- 6 > Apply appropriate control inputs to correct for crosswind and torque effects
- 7 > Verify the airspeed is "alive"
- 8 > At 55 KIAS, rotate smoothly and allow the airplane to fly off the ground
- 9 > After liftoff, crab into the wind to maintain the runway centerline track
- 10 > Accelerate to V_Y (74 KIAS at SL)
- 11 > After a positive rate of climb is established, tap the brakes
- 12 > 800 feet AGL, or higher safe altitude, maintain airspeed between 70-85 KIAS
- 13 > Execute the climb checklist

Notes:

When checking the engine instruments, include the tachometer to make sure sufficient power is being produced. Factors such as heat and altitude will affect engine performance.

NORMAL TAKEOFF PROFILE—C172SP





NORMAL TAKEOFF CALLOUTS—C172SP

SOFT-FIELD TAKEOFF AND CLIMB

References:

Airplane Flying Handbook, POH C172-SP, Private ACS & Commercial PTS

Description:

The takeoff technique when the runway is soft, rough, grass, dirt, etc.

Objective:

Develop the skills necessary to perform takeoffs on soft or unimproved runways.

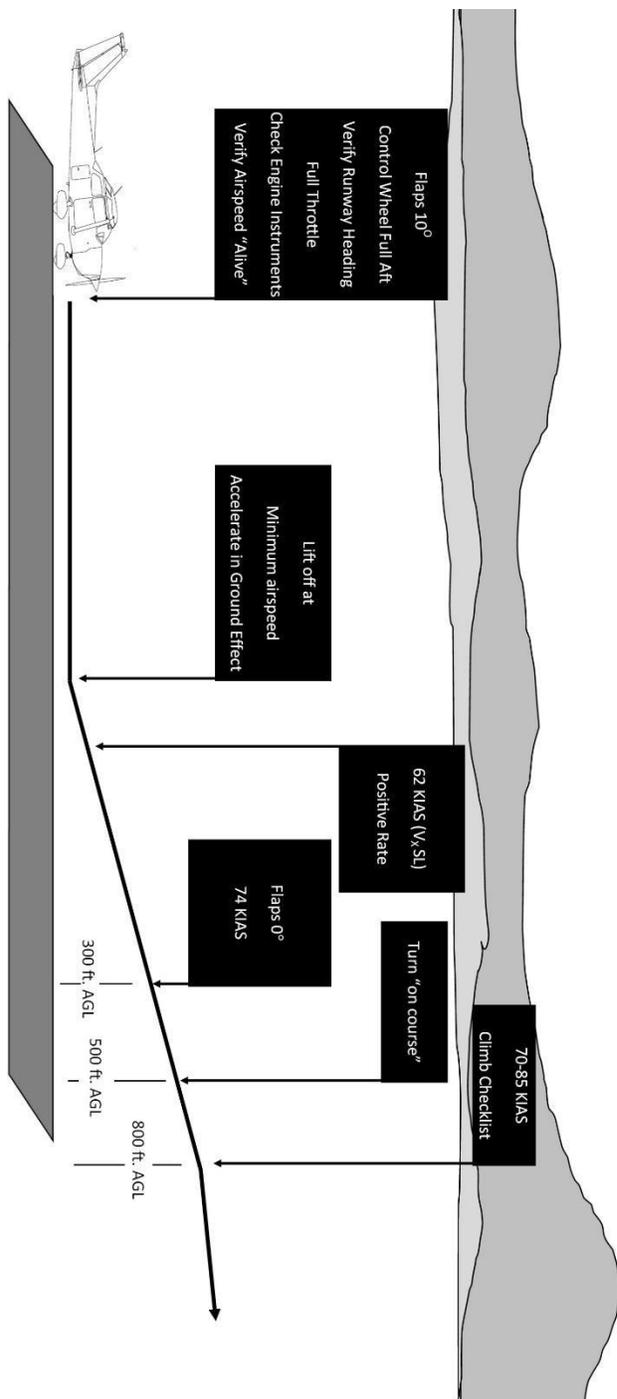
Procedure:

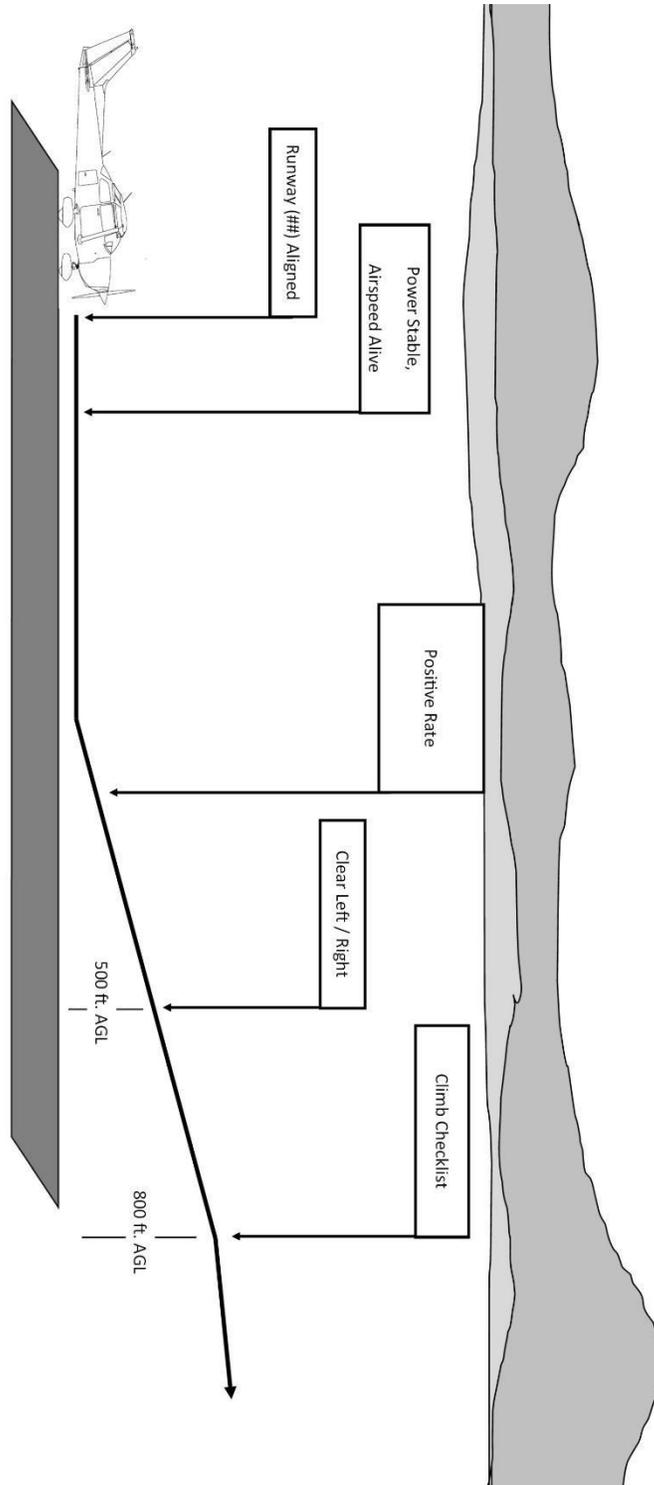
- 1 > Extend the flaps to the 10⁰ position
- 2 > Position the control wheel full aft and apply the proper crosswind correction with the ailerons
- 3 > Taxi the airplane onto the runway centerline
- 4 > Ensure the aircraft heading matches the charted runway heading
- 5 > Apply full throttle
- 6 > Verify that the engine instruments all indicate in the normal range
- 7 > Apply appropriate control inputs to correct for crosswind and torque effects
- 8 > Verify the airspeed is "alive"
- 9 > Lift off at minimum airspeed
- 10 > After liftoff, lower the nose to remain in ground effect
- 11 > Crab into the wind to maintain the runway centerline track
- 12 > Accelerate to V_x (62 KIAS at SL)
- 13 > After a positive rate of climb is established, tap the brakes
- 14 > 300 feet AGL, gradually retract the flaps and accelerate to V_y (74 KIAS at SL)
- 15 > 800 feet AGL, or higher safe altitude, maintain airspeed between 70-85 KIAS
- 16 > Execute the climb checklist

Notes:

When checking the engine instruments, include the tachometer to make sure sufficient power is being produced. Factors such as heat and altitude will affect engine performance.

SOFT-FIELD TAKEOFF PROFILE—C172SP





SOFT-FIELD TAKEOFF CALLOUTS—C172SP

SHORT-FIELD TAKEOFF AND MAXIMUM PERFORMANCE CLIMB

References:

Airplane Flying Handbook, POH C172-SP, Private ACS & Commercial PTS

Description:

The takeoff technique when the runway is not of sufficient length to permit the airplane to gradually accelerate to normal lift-off and climb-out speed, or there are obstructions along the takeoff path.

Objective:

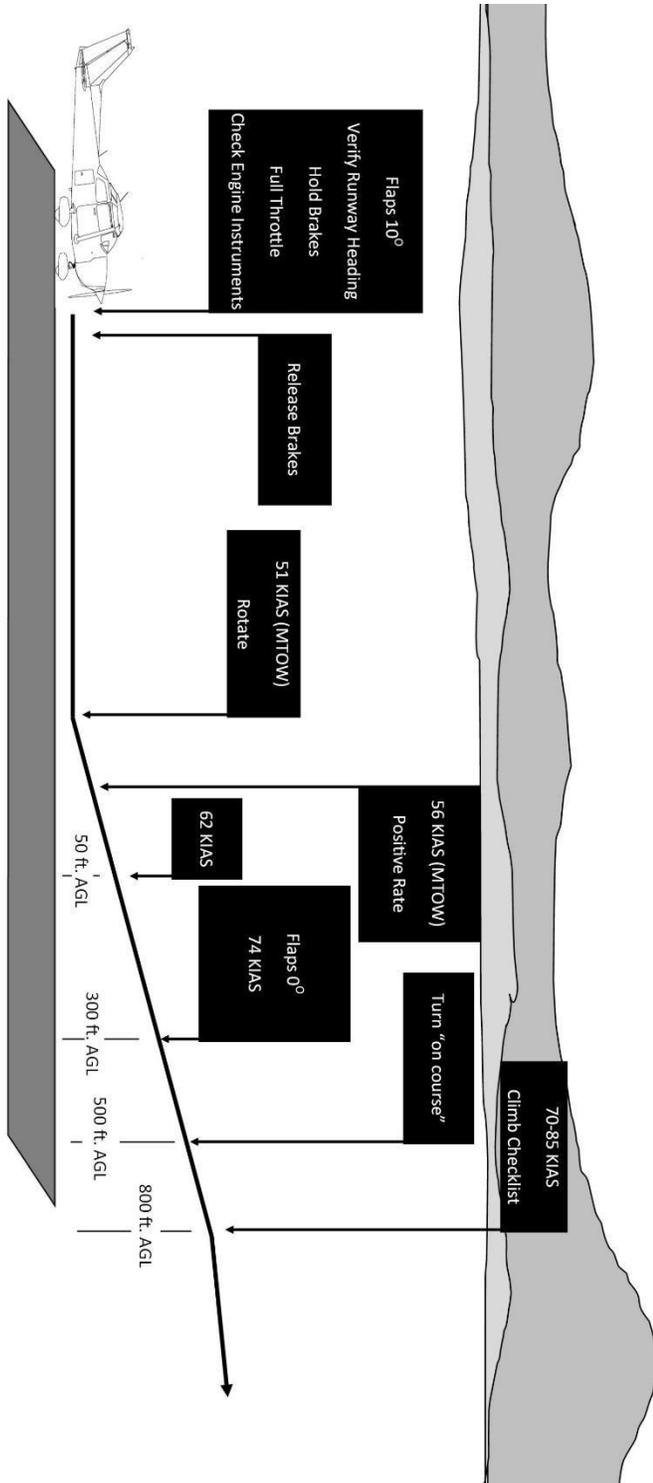
Develop the skills necessary to perform takeoffs on short runways and runways with obstacles present.

Procedure:

- 1 > Extend the flaps to the 10⁰ position
- 2 > Taxi the airplane onto the runway centerline as close to the end as safely possible
- 3 > Ensure the aircraft heading matches the charted runway heading
- 4 > Hold the brakes
- 5 > Apply full throttle
- 6 > Verify that the engine instruments all indicate in the normal range
- 7 > Apply appropriate control inputs to correct for crosswind and torque effects
- 8 > Verify the airspeed is "alive"
- 9 > At 51 KIAS (MTOW), apply back pressure to rotate and lift off the runway
- 10 > Crab into the wind to maintain the runway centerline track
- 11 > Accelerate to 56 KIAS (MTOW)
- 12 > After a positive rate of climb is established, tap the brakes
- 13 > 50 feet AGL and clear of the obstacle, accelerate to V_x (62 KIAS at SL)
- 14 > 300 feet AGL, retract the flaps and accelerate to V_y (74 KIAS at SL)
- 15 > 800 feet AGL, or higher safe altitude, maintain airspeed between 70-85 KIAS
- 16 > Execute the climb checklist

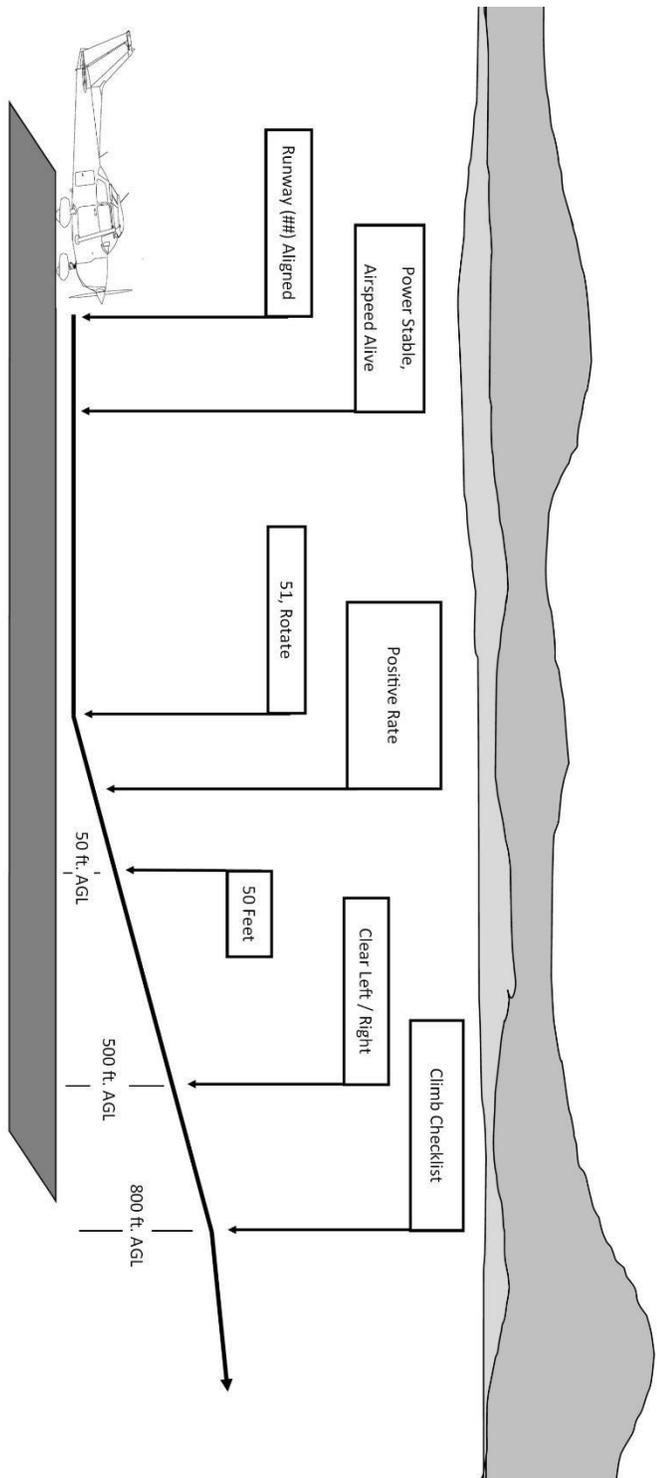
Notes:

When checking the engine instruments, include the tachometer to make sure sufficient power is being produced. Factors such as heat and altitude will affect engine performance.



SHORT-FIELD TAKEOFF PROFILE—C172SP

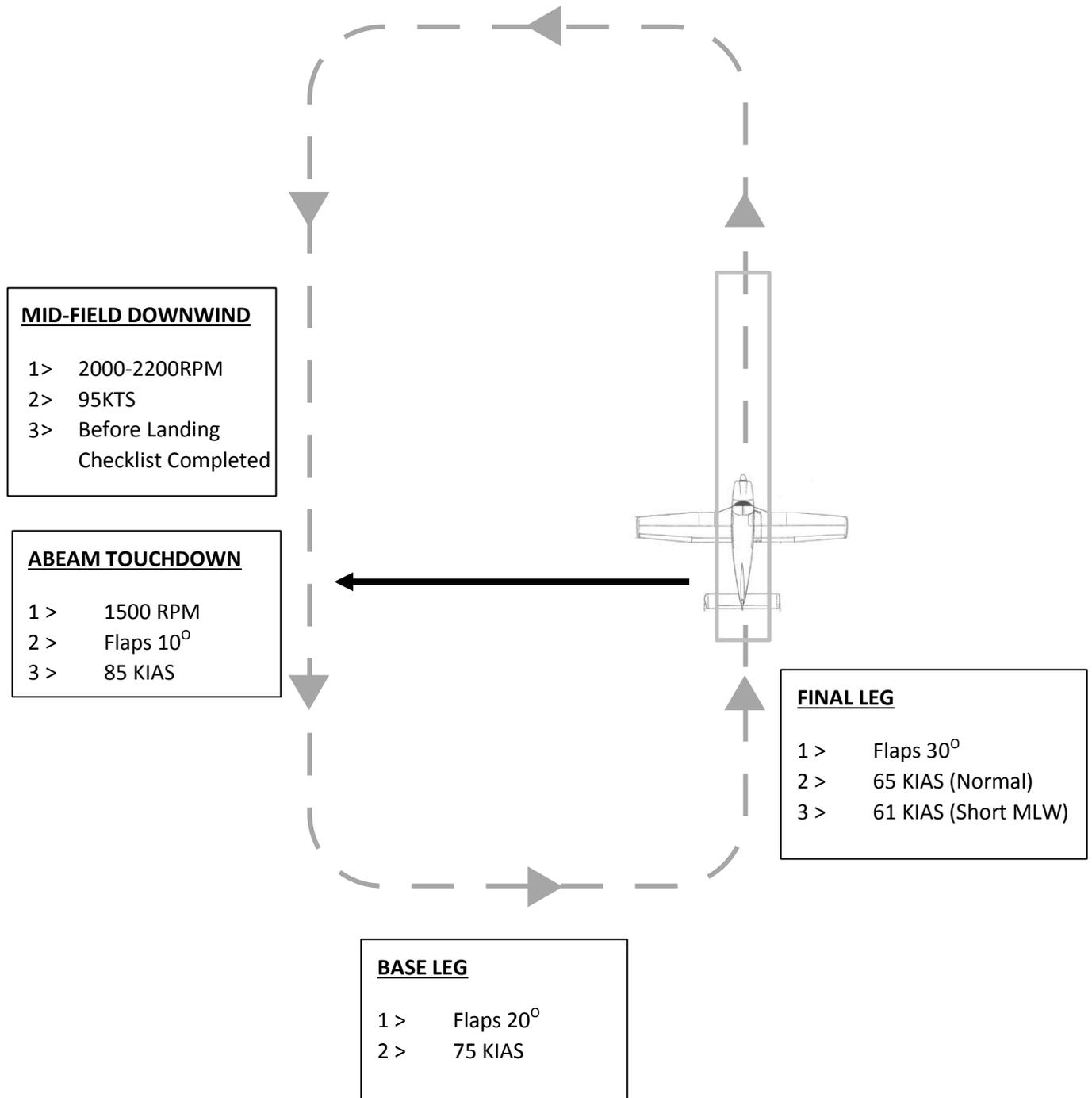
SHORT-FIELD TAKEOFF CALLOUTS—C172SP



TAFFIC PATTERN

References:

POH C172-SP



NORMAL AND CROSSWIND APPROACH AND LANDING

References:

Airplane Flying Handbook, POH C172-SP, Private ACS & Commercial PTS

Description:

The landing technique when the runway is of sufficient length to permit the airplane to gradually decelerate, and there are no obstructions along the approach path.

Objective:

Develop the skills necessary to perform normal and crosswind landings.

Procedure:

- 1 > Complete the before landing checklist prior to the mid-field downwind
- 2 > Designate the point of intended touchdown
- 3 > Abeam the touchdown point
 - a. Reduce power (approximately 1500 RPM)
 - b. Flaps 10^o
 - c. Airspeed 85 KIAS
- 4 > On the base leg
 - a. Flaps 20^o
 - b. Airspeed 75 KIAS
- 5 > On final
 - a. Flaps 30^o
 - b. Airspeed 65 KIAS
- 6 > If crosswind conditions are encountered, use a side slip to maintain the correct ground track and runway alignment
- 7 > Reduce the throttle and increase the pitch attitude in order to smoothly touchdown at the intended landing point as the throttle reaches idle
- 8 > After touchdown, apply the brakes as required and increase crosswind control input as necessary

SOFT-FIELD APPROACH AND LANDING

References:

Airplane Flying Handbook, POH C172-SP, Private ACS & Commercial PTS

Description:

The landing technique when the runway is soft, rough, grass, dirt, etc.

Objective:

Develop the skills necessary to perform landings on soft or unimproved runways.

Procedure:

- 1 > Complete the before landing checklist prior to the mid-field downwind
- 2 > Designate the point of intended touchdown
- 3 > Abeam the touchdown point
 - a. Reduce power (approximately 1500 RPM)
 - b. Flaps 10°
 - c. Airspeed 85 KIAS
- 4 > On the base leg
 - a. Flaps 20°
 - b. Airspeed 75 KIAS
- 5 > On final
 - a. Flaps 30°
 - b. Airspeed 65 KIAS
- 6 > If crosswind conditions are encountered, use a side slip to maintain the correct ground track and runway alignment
- 7 > Reduce the throttle and increase the pitch attitude in order to smoothly touchdown at the intended landing point as the throttle reaches idle
- 8 > Touch down with the main gear first using some power to smoothly transfer the weight of the airplane from the wings to the main gear
- 9 > After touchdown, continue to apply back pressure to keep the nose wheel off the runway as long as possible, and increase crosswind control input as necessary
- 10 > Use minimal braking until off of the soft surface

SHORT-FIELD APPROACH AND LANDING

References:

Airplane Flying Handbook, POH C172-SP, Private ACS & Commercial PTS

Description:

The landing technique when the runway is not of sufficient length to permit the airplane to gradually decelerate, or there are obstructions along the approach path.

Objective:

Develop the skills necessary to perform landings on short runways and runways with obstacles present.

Procedure:

- 1 > Complete the before landing checklist prior to the mid-field downwind
- 2 > Designate the point of intended touchdown
- 3 > Abeam the touchdown point
 - a. Reduce power (approximately 1500 RPM)
 - b. Flaps 10°
 - c. Airspeed 85 KIAS
- 4 > On the base leg
 - a. Flaps 20°
 - b. Airspeed 75 KIAS
- 5 > On final
 - a. Flaps 30°
 - b. Airspeed 61 KIAS (at MLW)
- 6 > If crosswind conditions are encountered, use a side slip to maintain the correct ground track and runway alignment
- 7 > Reduce the throttle and increase the pitch attitude in order to smoothly touchdown at the intended landing point as the throttle reaches idle
- 8 > Touch down at a full stall with the main gear first
- 9 > After touchdown, retract flaps as required for maximum braking 10 > Position the control wheel full aft and apply the brakes as necessary

Notes:

When practicing short-field landings on runways of adequate length, simulate the use of maximum braking by announcing "maximum braking". Some brake pressure should still be used to reinforce technique should it be required on an actual short runway.

POWER-OFF 180° ACCURACY APPROACH AND LANDING

References:

Airplane Flying Handbook, POH C172-SP, Commercial PTS

Description:

An approach and landing made from the downwind leg by gliding with the engine at idle to a specific touchdown point. Proper estimations of distance to touchdown and glide angle are required.

Objective:

Develop the skills necessary to accurately plan and judge a power-off approach to a safe landing.

Procedure:

- 1 > Complete the before landing checklist prior to the mid-field downwind
- 2 > Establish the airplane on downwind parallel to the runway, no higher than 1000 feet AGL
- 3 > Designate the point of intended touchdown
- 4 > Abeam the touchdown point, smoothly reduce the throttle to idle
- 5 > Reduce airspeed to best glide (68 KIAS at MTOW and zero wind)
- 6 > Extend flaps as required
- 7 > Maintain best glide speed until able to reduce speed to ensure touchdown in a normal landing attitude.

GO-AROUND / REJECTED LANDING

References:

Airplane Flying Handbook, POH C172-SP, Private ACS & Commercial PTS

Description:

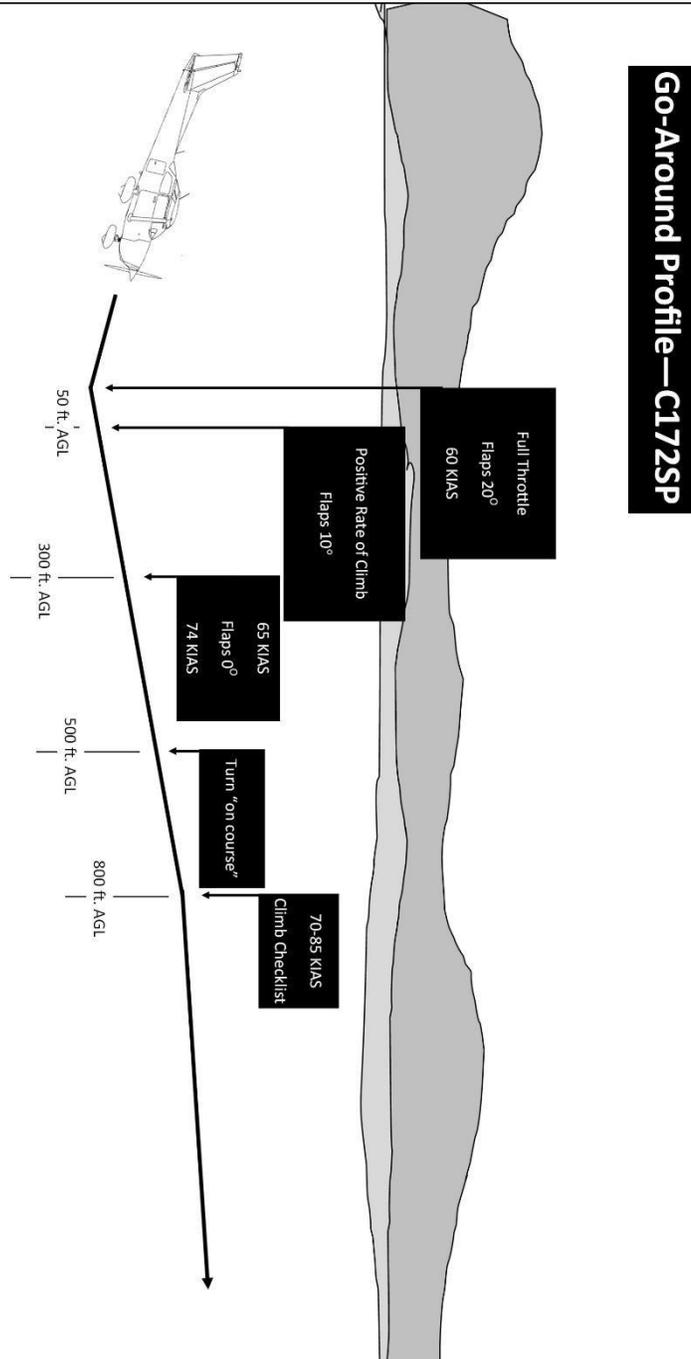
The maneuver that is used when a landing is rejected. The airplane is brought from a landing configuration and attitude to a climb configuration and attitude.

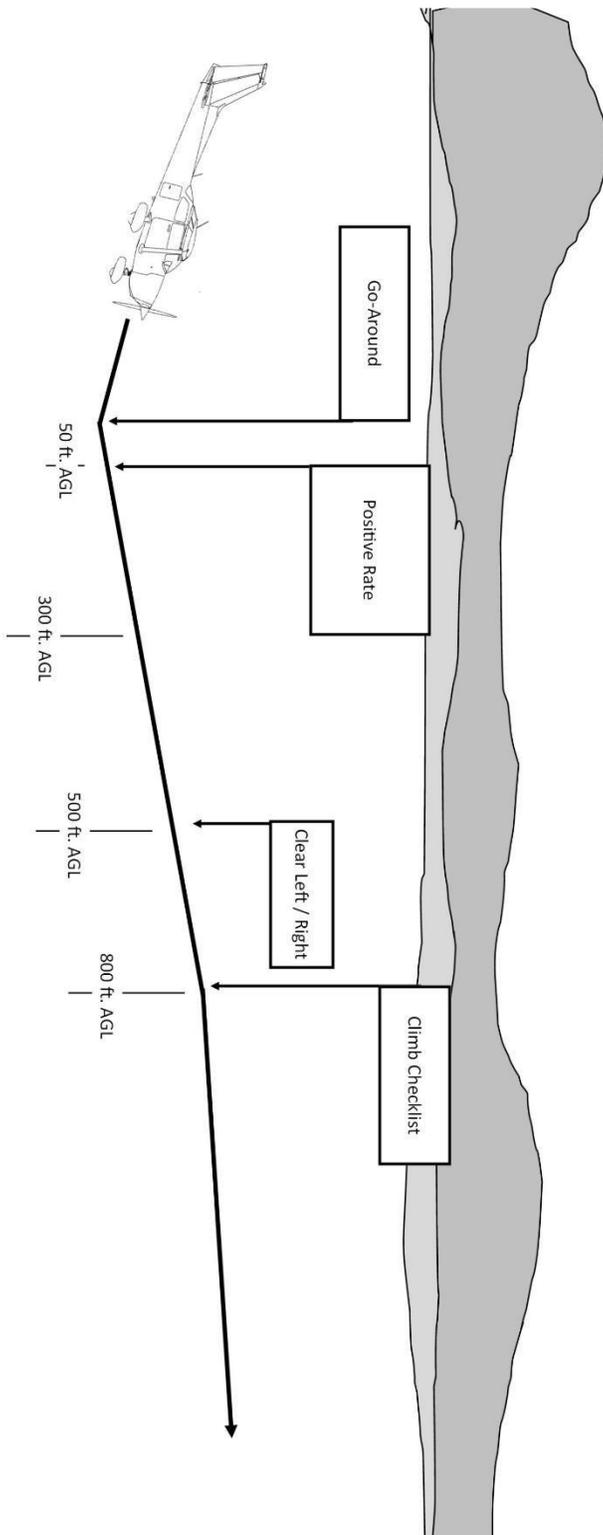
Objective:

Develop the skills necessary to safely reject a landing by applying the proper procedures.

Procedure:

- 1 > **POWER UP:** Apply full throttle
- 2 > **PITCH UP:** Increase pitch attitude to initiate a climb
- 3 > **CLEAN UP:** Retract flaps to 20°
Pitch for 60 KIAS
After a positive rate of climb is established, retract flaps to 10°
- 4 > 50 feet AGL and clear of the obstacle, accelerate to 65 KIAS
- 5 > **SPEAK UP:** Announce to tower (or CTAF) that you are “going around”
- 6 > 300 feet AGL, retract the flaps and accelerate to V_Y (74 KIAS at SL)
- 7 > 800 feet AGL, or higher safe altitude, maintain airspeed between 70-85 KIAS
- 8 > Execute the climb checklist





Go-Around Callouts—C172SP

STEEP TURNS

References:

Airplane Flying Handbook, POH C172-SP, Private ACS & Commercial PTS

Description:

This maneuver consists of two 360° turns in opposite directions, while maintaining the airplane in level flight with a 45° (Private) or 50° (Commercial) angle of bank.

Objective:

Develop the pilot's coordination, division of attention and smoothness at the controls with performing a high performance turning maneuver.

Procedure:

- 1 > Complete the pre-maneuver checklist
- 2 > Ensure the maneuvering area is clear of traffic and obstructions
- 3 > Establish an altitude to allow the maneuver to be completed no lower than 1500 feet AGL
- 4 > Select a ground reference point and note the corresponding heading for entry and exit
- 5 > Establish an airspeed of 95 KIAS (or V_A if V_A is less than 110 KIAS based on actual weight)
- 6 > Roll into a coordinated left or right 45°/50° bank turn, applicable
- 7 > Adjust pitch to maintain altitude
- 8 > Adjust power to maintain airspeed
- 9 > Begin the rollout at an angle equal to half the bank angle prior to the entry heading
- 10 > Rollout on entry heading
- 11 > Adjust pitch and power to maintain altitude and airspeed
- 12 > Check the area for the second turn in the opposite direction
- 13 > Execute a turn in the opposite direction (steps 5-10)
- 14 > Resume straight and level flight

STEEP SPIRAL

References:

Airplane Flying Handbook, POH C172-SP, Commercial PTS

Description:

This maneuver combines elements of turns around a point with a descending glide. A constant radius circle is flown around a point on the ground while descending in a spiraling glide, with the steepest bank angle not exceeding 60°. Constant airspeed is maintained throughout.

Objective:

Develop the pilot's ability to divide attention and maintain positive aircraft control in a steep glide.

Procedure:

- 1 > Complete the pre-maneuver checklist
- 2 > Ensure the maneuvering area is clear of traffic and obstructions
- 3 > Select a suitable ground reference point, prominent enough to be seen from altitude
- 4 > Establish the airplane at an altitude sufficient to complete at least three complete 360° turns
- 5 > Maneuver the airplane to enter on the downwind leg approximately ¼ nm from the selected point
 - > Reduce the throttle to idle
- 7 > Roll into a coordinated turn (either direction)
- 8 > Establish an airspeed of 70 KIAS
- 9 > Apply wind drift correction throughout the descent to maintain a constant radius around the point
- 10 > Recover after three turns at or above 1000 feet AGL
- 11 > Resume straight and level flight

Notes:

Minimum recovery altitude is 1000 feet AGL

If sufficient altitude is not available, due to ceilings, this maneuver may be practiced with reduced turns.

Operating the engine at idle for a prolonged period can cause spark plug fouling and excessive engine cooling. The engine should be cleared periodically (on the upwind leg)

For winter operations, use 1200 RPM to prevent shock cooling the engine.

CHANDELLES

References:

Airplane Flying Handbook, POH C172-SP, Commercial PTS

Description:

This maneuver is a high performance climbing turn. The airplane turns 180° while climbing in order to gain the maximum altitude without stalling.

Objective:

Develop the pilot's coordination and division of attention between the instruments, the airplane's attitude and outside visual references.

Procedure:

- 1 > Complete the pre-maneuver checklist
- 2 > Ensure the maneuvering area is clear of traffic and obstructions
- 3 > Establish an altitude to allow the maneuver to be completed no lower than 1500 feet AGL
- 4 > Select a suitable ground reference point to identify the 90° point in the maneuver
- 5 > Establish an airspeed of 105 KIAS
- 6 > Roll into a coordinated 30° bank
- 7 > Apply full power (do not exceed 2700 RPM)
- 8 > Begin to increase pitch attitude
- 9 > Maximum pitch up should be achieved at the 90° point
- 10 > Begin a slow, smooth, coordinated rollout to arrive at 0° bank at the 180° point
- 11 > Continue to increase back pressure as required to maintain the maximum pitch attitude until reaching the 180° point
- 12 > Upon completing the 180° turn, the wings are level and the airspeed should be close to stall speed
- 13 > Recover by gradually decreasing the pitch attitude and allowing the airspeed to accelerate while maintaining the altitude that was reached at the 180° point
- 14 > Resume straight and level flight

Notes:

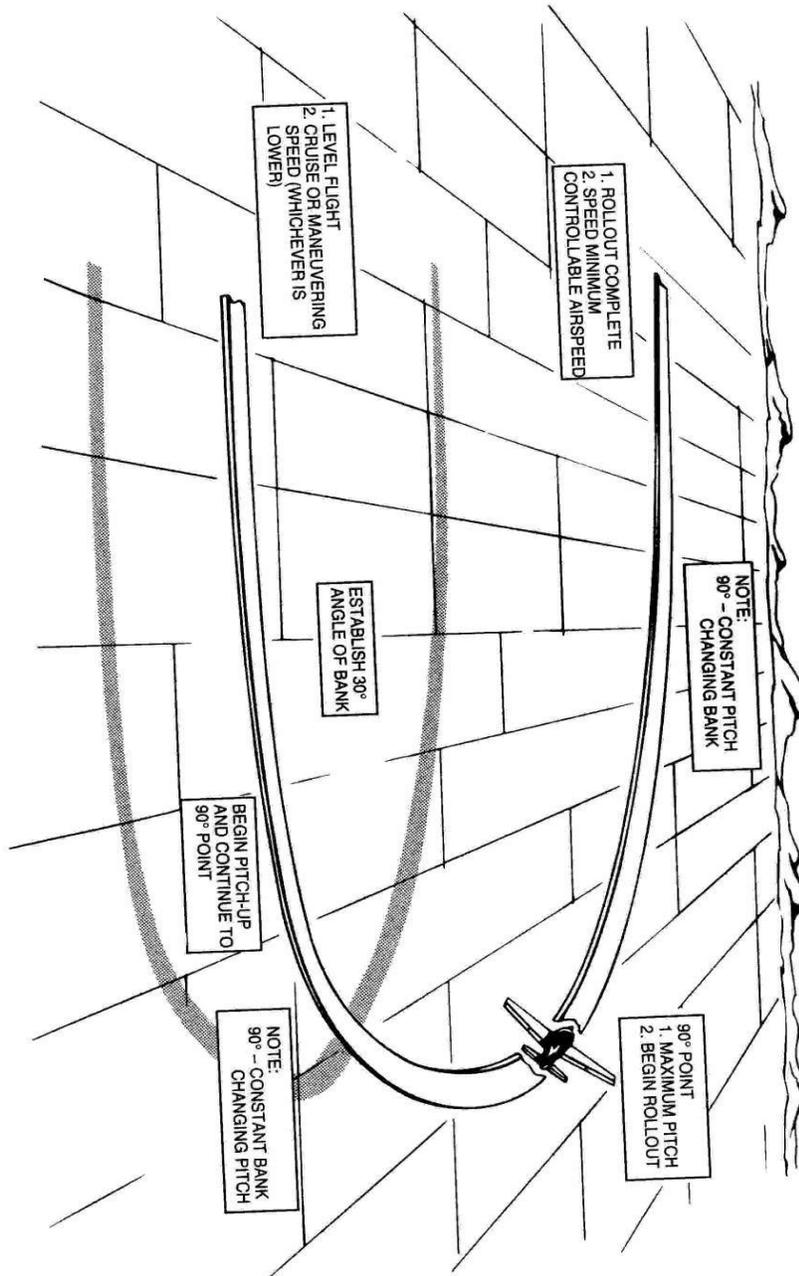
When possible perform while turning into the wind to cover less ground in the practice area.

See diagram on next page

CHANDELLE DIAGRAM

References:

Airplane Flying Handbook



LAZY EIGHTS

References:

Airplane Flying Handbook, POH C172-SP, Commercial PTS

Description:

This maneuver consists of two 180° turns, in opposite directions, while making a climb and a descent in a symmetrical pattern during each turn.

Objective:

Develop the pilot's feel for varying control forces, and the ability to plan and remain oriented while maneuvering the airplane with positive, accurate control. The pilot must constantly change pitch and bank throughout the maneuver.

Procedure:

- 1 > Complete the pre-maneuver checklist
- 2 > Ensure the maneuvering area is clear of traffic and obstructions
- 3 > Establish an altitude to allow the maneuver to be completed no lower than 1500 feet AGL
- 4 > Select suitable ground reference points to identify the 45°, 90°, 135° and 180° points of the maneuver
- 5 > Establish an airspeed of 105 KIAS
- 6 > Slowly and smoothly enter a climbing turn
- 7 > Adjust the pitch and bank in order to reach the maximum pitch up attitude and approximately 15° angle of bank at the 45° point
- 8 > Adjust the pitch and bank so that the nose crosses through the horizon with approximately 30° angle of bank at the 90° point
- 9 > Adjust the pitch and bank in order to reach the maximum pitch down attitude and approximately 15° angle of bank at the 135° point
- 10 > Adjust the pitch and bank so that the airplane levels at the entry altitude and airspeed with a 0° angle of bank at the 180° point
- 11 > **IMMEDIATELY** begin a turn in the other direction (repeat steps 5-9)
- 12 > Resume straight and level flight

Notes:

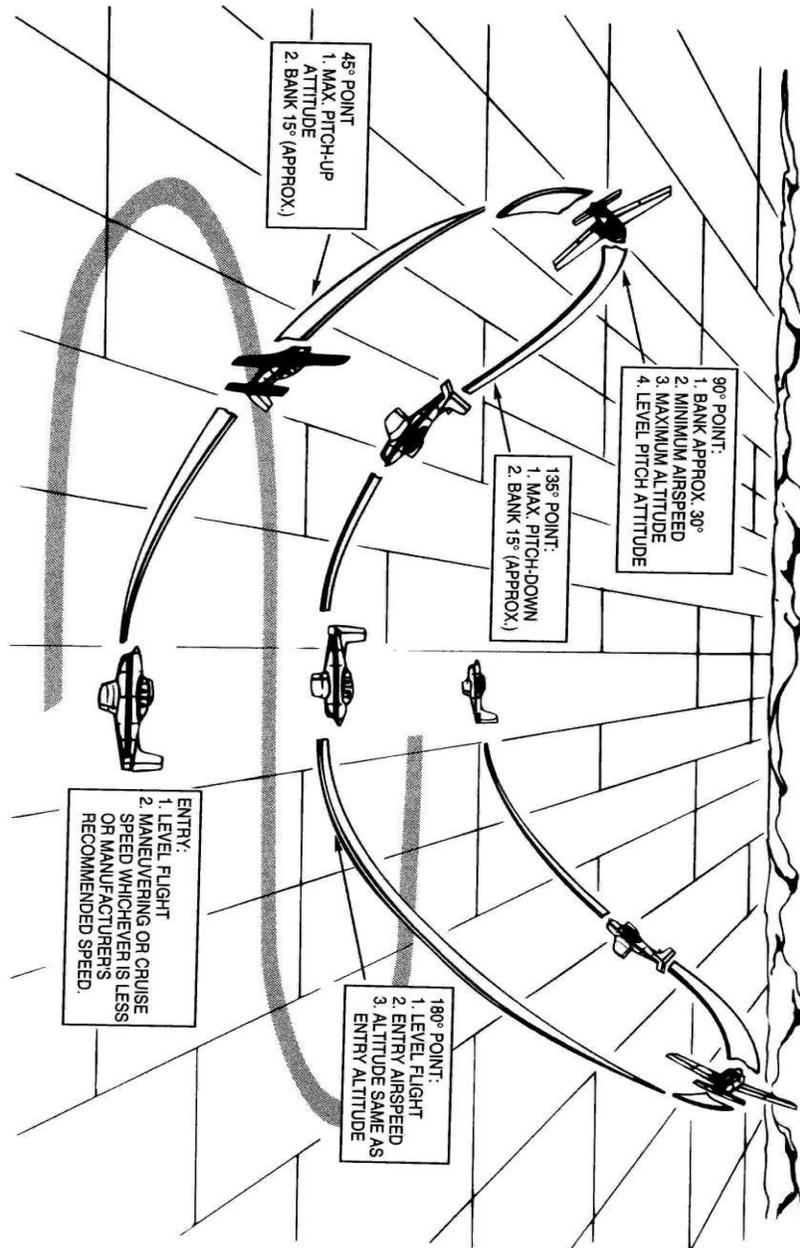
When possible perform while turning into the wind to cover less ground in the practice area.

See diagram on next page

LAZY EIGHTS DIAGRAM

References:

Airplane Flying Handbook



EIGHTS ON PYLONS

References:

Airplane Flying Handbook, POH C172-SP, Commercial PTS

Description:

The airplane is maneuvered around two preselected points on the ground in a figure "8" pattern, keeping the points fixed to a reference point on the aircraft by varying the altitude and bank angle.

Objective:

Develop the pilot's coordination and division of attention between the instruments, the airplane's attitude and the position with respect to the ground references.

Procedure:

- 1 > Complete the pre-maneuver checklist
- 2 > Ensure the maneuvering area is clear of traffic and obstructions
- 3 > Determine the wind direction (dust, smoke, wind drift circle, nearby airport, fields, flags, etc.)
- 4 > Determine the pivotal altitude (approximately 800 feet AGL at 95 knot groundspeed)
- 5 > Select two ground reference points perpendicular to the wind and suitable distance apart
- 6 > Establish an airspeed of 95 KIAS
- 7 > Enter the maneuver with a 45° angle between the pylons at pivotal altitude
- 8 > Abeam the first pylon, roll into a coordinated bank toward the pylon in order to place the airplane reference line on the pylon
- 9 > Keep the relative position between the pylon and airplane reference line at the same spot by varying altitude to compensate for varying ground speed throughout the maneuver
- 10 > As the airplane reaches the 45° entry angle to the second pylon, roll out of the turn
- 11 > Fly straight and level until abeam the second reference
- 12 > Roll into a coordinated bank toward the second pylon (repeat steps 8-10) 13 > Resume straight and level flight

Notes:

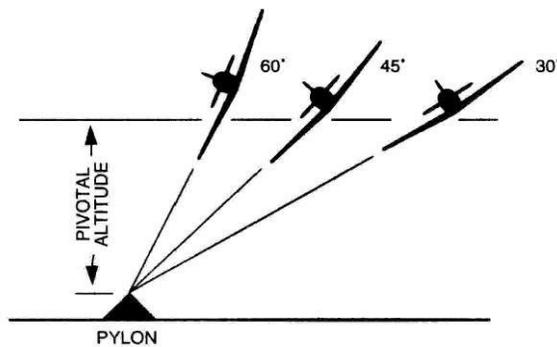
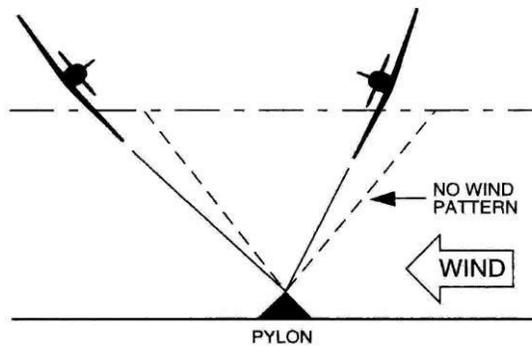
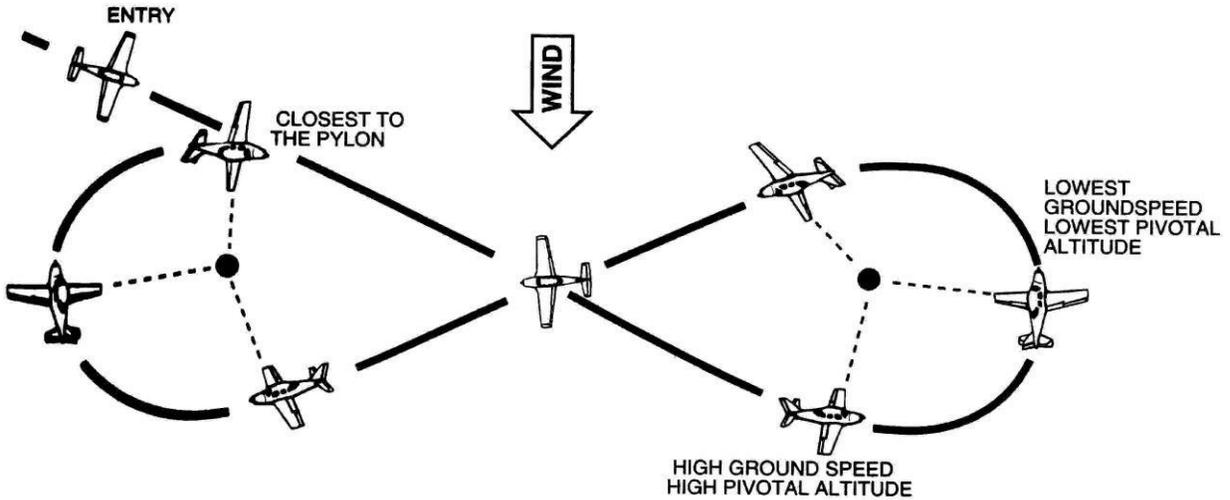
If the maneuver is performed along a road with several possible reference points, it is not necessary to pick both pylons prior to entering the maneuver.

See diagram on next page

EIGHTS ON PYLONS DIAGRAM

References:

Airplane Flying Handbook



RECTANGULAR PATTERN

References:

Airplane Flying Handbook, POH C172-SP, Private ACS

Description:

The rectangular course is a training maneuver in which the ground track of the airplane is equidistant from all sides of a selected rectangular area on the ground.

Objective:

Develop the pilot's coordination and division of attention between the instruments, the airplane's attitude and the position with respect to the ground references while developing recognition of drift toward or away from a line parallel to the intended ground track.

Procedure:

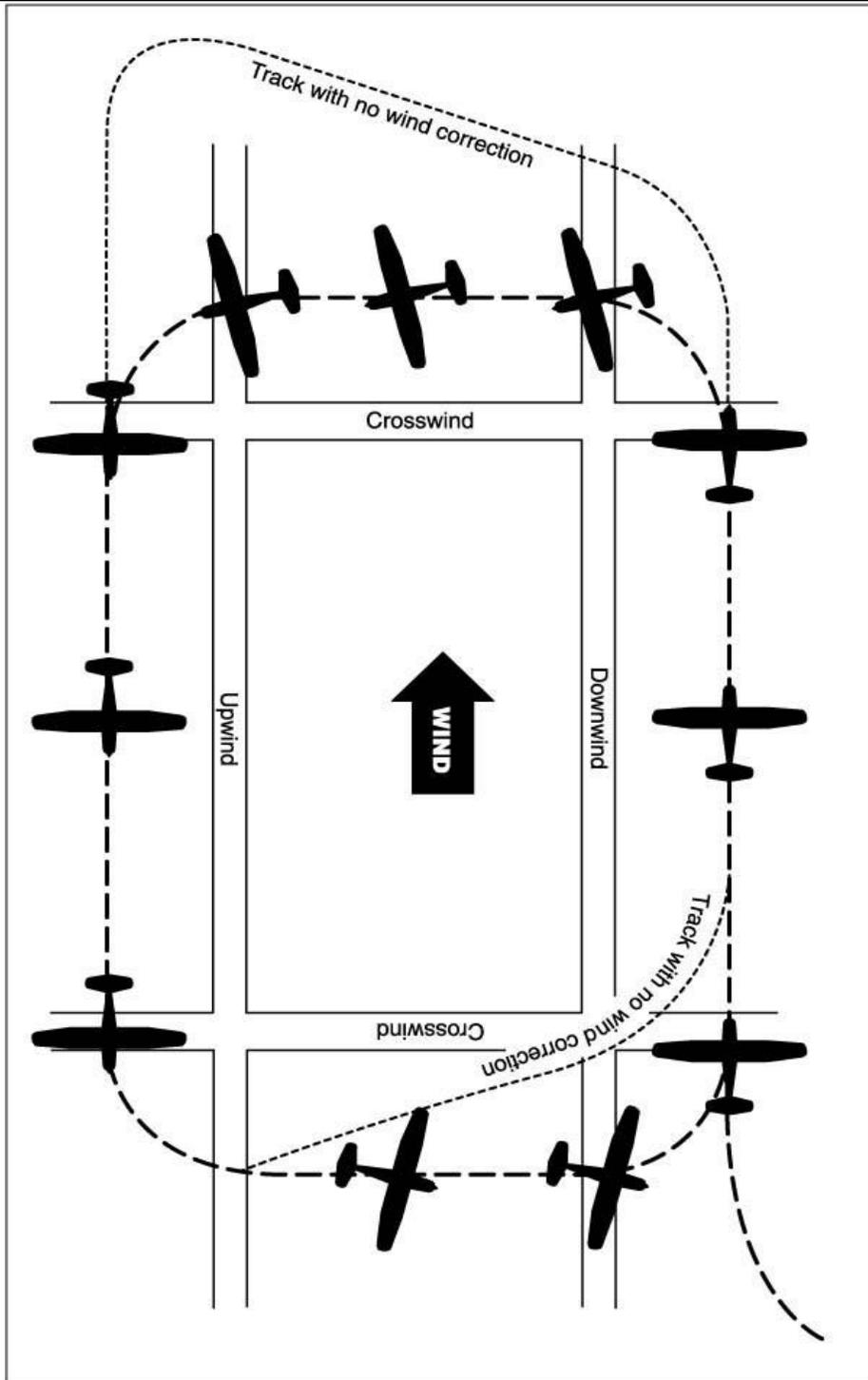
- 1 > Complete the pre-maneuver checklist
- 2 > Ensure the maneuvering area is clear of traffic and obstructions
- 3 > Determine the wind direction (dust, smoke, wind drift circle, nearby airport, fields, flags, etc.)
- 4 > Select suitable square or rectangular ground reference bounded on four sides for the maneuver
- 5 > Establish an airspeed of 95 KIAS at an altitude between 600-1000 feet AGL (~2,000 feet MSL locally)
- 6 > Begin the maneuver by entering midfield at a 45° angle on the downwind
- 7 > Maintain a distance of ¼ to ½ mile from the selected boundaries
- 8 > Utilize crab to maintain desired ground track, as necessary
- 9 > Begin all turns abeam predetermined boundaries by banking the aircraft (not to exceed 45°) to maneuver onto the next leg
- 10 > Level the wings on an appropriate heading to maintain desired ground track by crabbing the aircraft
- 11 > The maneuver is complete when one full pattern has been flown 12 > Resume straight and level flight

Notes:

This maneuver can be entered from any leg. It is not required to enter on the downwind. However, for purposes of consistency, it is preferred to enter on the downwind.

See diagram on next page.

-SP, Private ACS



S-TURNS ACROSS A ROAD

References:

Airplane Flying Handbook, POH C172-SP, Private ACS

Description:

An S-turn across a road is a practice maneuver in which the airplane's ground track describes semicircles of equal radii on each side of a selected straight line on the ground.

Objective:

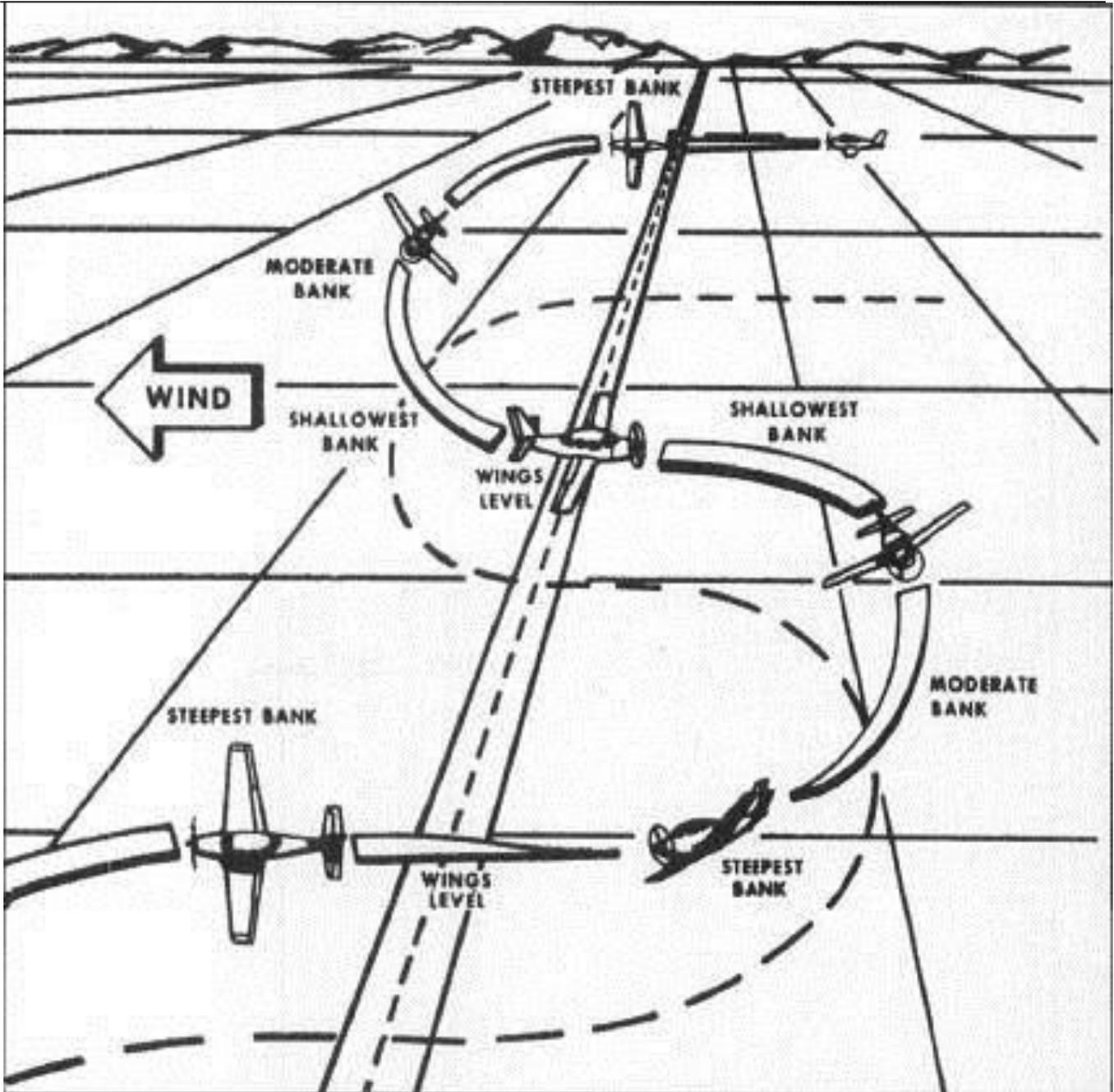
Develop the ability to compensate for drift during turns, orient the flightpath with ground references, follow an assigned ground track, arrive at specified points on assigned headings, and divide the pilot's attention.

Procedure:

- 1 > Complete the pre-maneuver checklist
- 2 > Ensure the maneuvering area is clear of traffic and obstructions
- 3 > Determine the wind direction (dust, smoke, wind drift circle, nearby airport, fields, flags, etc.)
- 4 > Select a suitable line or road that lies 90° to the wind
- 5 > Establish an airspeed of 95 KIAS at an altitude between 600-1000 feet AGL (~2,000 feet MSL locally)
- 6 > Enter the maneuver from the upwind side on a downwind heading
- 7 > When directly over the road, the first turn should be initiated
- 8 > The downwind leg will result in the highest groundspeed, therefore, the highest bank is initially required (not to exceed 45°)
- 9 > A gradual reduction in bank is required in order to maintain a constant radius of ¼ to ½ mile while transitioning from the tailwind to headwind portion of the maneuver
- 10 > The wings should become level upon reaching the line or road
- 11 > Immediately upon crossing the line or road, a turn in the opposite direction should be started
- 12 > The upwind leg will result in the slowest groundspeed, therefore, the shallowest bank is initially required
- 13 > A gradual increase in bank is required in order to maintain a constant radius of ¼ to ½ mile while transitioning from the headwind to tailwind portion of the maneuver
- 14 > The wings should become level upon reach the line or road 15 > Resume straight and level flight

See diagram on next page

-SP, Private ACS



URNS AROUND A POINT

References:

Airplane Flying Handbook, POH C172

Description:

In turns around a point, the airplane is flown in two or more complete circles of uniform radii or distance from a prominent ground reference point using a maximum bank of approximately 45° while maintaining a constant altitude.

Objective:

To perfect the ability to subconsciously control the airplane while dividing attention between the flightpath and ground references and to teach the student that the radius of a turn is a distance which is affected by the degree of bank used when turning with relation to a definite object.

Procedure:

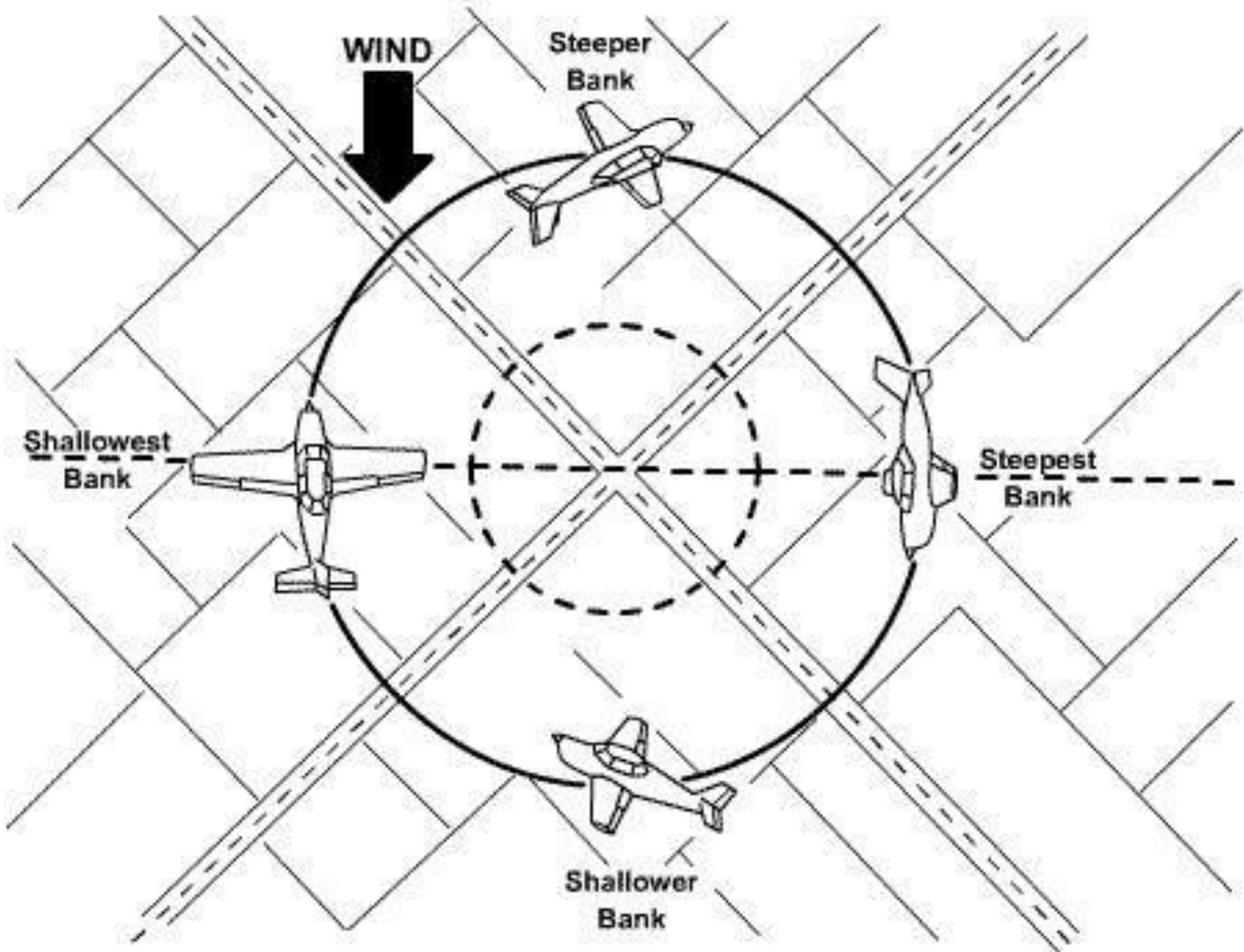
- 1 > Complete the pre-maneuver checklist
- 2 > Ensure the maneuvering area is clear of traffic and obstructions
- 3 > Determine the wind direction (dust, smoke, wind drift circle, nearby airport, fields, flags, etc.)
- 4 > Select a suitable ground reference such as isolated trees, crossroads, or similar landmark
- 5 > Establish an airspeed of 95 KIAS at an altitude between 600-1000 feet AGL (~2,000 feet MSL locally)
- 6 > Enter the maneuver on a downwind heading at an appropriate radius which allows the pilot to see the reference throughout the maneuver (approximately ¼ to ½ mile)
- 7 > When abeam the reference point, a bank must be initiated to maintain a constant radius
- 8 > The initial bank will likely be the steepest (not to exceed 45°) if any significant wind is present
- 9 > A gradual reduction in bank must occur while transitioning from the tailwind to headwind portions of the maneuver
- 10 > Upon reaching the headwind portion, bank will have to be gradually increased to account for the increasing tailwind and groundspeed
- 11 > Once abeam the selected reference points back on the downwind leg, repeat steps 7-10
- 12 > The maneuver is complete when at least two turns have been accomplished 13 > Resume straight and level flight

Notes:

See diagram on next page

-SP, Private ACS

URNS ABOUT A POINT



MANEUVERING DURING SLOW FLIGHT

References:

Airplane Flying Handbook, POH C172-SP, Private ACS & Commercial PTS

Description:

The Private Pilot will “establish and maintain an airspeed, approximately 5-10 knots above the 1G stall speed, at which the airplane is capable of maintaining controlled flight without activating a stall warning.” The Commercial Pilot will fly the airplane at minimum controllable airspeed. The desired airspeed is such that any increase in load factor, increase in angle of attack, or decrease in power will result in an immediate stall. Turns, climbs, and descents will be accomplished while maintaining these airspeeds. The aircraft will be flown in various configurations.

Objective:

Develop the pilot’s ability to control the aircraft in slow flight, recognize the changes in control effectiveness, and rate and radius of turns. The pilot will develop an understanding of the risks associated with maneuvering during slow flight.

Procedure:

- 1 > Complete the pre-maneuver checklist
- 2 > Ensure the maneuvering area is clear of traffic and obstructions
- 3 > Establish an altitude to allow the maneuver to be completed no lower than 1500 feet AGL
- 4 > Select a ground reference point and note the corresponding heading
- 5 > Reduce the throttle to approximately 1500 RPM
- 6 > Apply back pressure to maintain altitude as the airplane slows down
- 7 > Private Pilots will enter slow flight and Commercial Pilots will slow to minimum controllable airspeed and note the airspeed to be maintained.
- 8 > Perform a turn while maintaining airspeed and altitude
- 9 > Below V_{FE} (110), set flaps 10°
- 10 > In this new configuration, note the airspeed to be maintained.
- 11 > Perform a turn and a climb (can be accomplished separately or together as desired)
- 12 > Below V_{FE} (85), set flaps 20°
- 13 > In this new configuration, note the airspeed to be maintained.
- 14 > Perform a turn while maintaining airspeed and altitude
- 15 > Below V_{FE} (85), set flaps 30°
- 16 > In this new configuration, note the airspeed to be maintained.
- 17 > Perform a turn and a descent (can be accomplished separately or together as desired)
- 18 > Recover: apply full throttle and retract flaps incrementally
- 19 > Resume straight and level flight

POWER-OFF STALLS

References:

Airplane Flying Handbook, POH C172-SP, Private ACS & Commercial PTS

Description:

This maneuver begins with the aircraft being set up in a landing configuration and in a descent at final approach speed. The throttle is then reduced and the pitch is increased to induce a stall. As the stall occurs, the pilot recovers and returns to straight and level cruise flight.

Objective:

Develop the pilot's ability to recognize the indications leading to stalls and to make a prompt, effective recovery with minimum loss of altitude.

Procedure:

- 1 > Complete the pre-maneuver checklist
- 2 > Ensure the maneuvering area is clear of traffic and obstructions
- 3 > Establish an altitude to allow the maneuver to be completed no lower than 1500 feet AGL
- 4 > Select a ground reference to simulate a runway
- 5 > Reduce the throttle to 1500 RPM
- 6 > Apply back pressure to maintain altitude as the airplane slows to approach speed
- 7 > Below V_{FE} (110/85 KIAS, as applicable), incrementally extend the flaps to 30°
- 8 > Establish a descent at approach speed (65 KIAS)
- 9 > Reduce throttle to idle
- 10 > Increase pitch attitude to induce a stall
- 11 > Announce the indications of the stall (horn, buffet, loss of control effectiveness etc.)
 - a. Recover after the full stall has occurred for Private course
- 12 > Recover: apply full throttle, reduce the angle of attack, flaps to 20°
- 13 > Establish a climb at 60 KIAS and retract flaps to 10°
- 14 > Maintain a positive rate of climb and retract flaps to 0° above V_x (62KIAS)
- 15 > Climb to a specified altitude.
- 16 > Resume straight and level flight

Notes: This maneuver should also be practice while in turns using up to a 20° angle of bank.

POWER-ON STALLS

References:

Airplane Flying Handbook, POH C172-SP, Private ACS & Commercial PTS

Description:

This maneuver simulates a stall after takeoff, or during departure.

Objective:

Develop the pilot's ability to recognize the indications leading to stalls and to make a prompt, effective recovery with minimum loss of altitude.

Procedure:

- 1 > Complete the pre-maneuver checklist
- 2 > Ensure the maneuvering area is clear of traffic and obstructions
- 3 > Establish an altitude to allow the maneuver to be completed no lower than 1500 feet AGL
- 4 > Reduce the throttle to 1500 RPM
- 5 > Apply back pressure to maintain altitude as the airplane slows to rotation speed
- 6 > At rotation speed (normal 55 KIAS), apply full throttle
- 7 > Increase pitch attitude to induce a stall
- 8 > Announce the indications of the stall (horn, buffet, loss of control effectiveness etc.)
 - a. Recover after the full stall has occurred for Private course
- 9 > Recover: apply full throttle and reduce the angle of attack
- 10 > Establish a climb at V_x (62 KIAS)
- 11 > After a positive rate of climb is established and obstacles cleared, establish a climb at V_y (74 KIAS)
- 12 > Climb to a specified altitude
- 13 > Resume straight and level flight

Notes:

This maneuver should also be practice while in turns using up to a 20° angle of bank

This maneuver should also be practiced with various configurations to simulate short-field takeoffs and go-around scenarios

ACCELERATED STALLS

References:

Airplane Flying Handbook, POH C172-SP, Commercial PTS

Description:

This maneuver consists of bringing the airplane into a stalled condition above the usual stall speed by increasing the load factor on the airplane.

Objective:

To demonstrate the effects load factor can have on stall speed.

Procedure:

- 1 > Complete the pre-maneuver checklist
- 2 > Ensure the maneuvering area is clear of traffic and obstructions
- 3 > Establish an altitude to allow the maneuver to be completed no lower than 3000 feet AGL
- 4 > Reduce the throttle to 1500 RPM
- 5 > Apply back pressure to maintain altitude as the airplane slows down
- 6 > At 68 KIAS ($V_{S1} + 20$ kts) roll into a coordinated 45° angle of bank turn
- 7 > Reduce throttle to idle
- 8 > Apply back pressure firmly to induce a stall
- 9 > Announce the indications of the stall (horn, buffet, loss of control effectiveness etc.)
- 10 > Recover: apply full throttle and reduce the angle of bank and back pressure
- 11 > Resume straight and level cruise

EMERGENCY DESCENTS

References:

Airplane Flying Handbook, POH C172-SP, Private ACS & Commercial PTS

Description:

The airplane is configured to lose altitude rapidly in the event of an emergency.

Objective:

Develop the pilot's ability to safely and promptly descend the airplane as rapidly as possible.

Procedure:

- 1 > Complete the pre-maneuver checklist
- 2 > Ensure the maneuvering area is clear of traffic and obstructions
- 3 > Reduce the throttle to idle
- 4 > Bank the airplane up to 45° to begin the descent and maintain a 1 "G" load factor
- 5 > Adjust pitch to maintain at or below 129 KIAS during the descent
- 6 > Lead the level off by 10% of the descent rate
- 7 > Level the airplane at the desired altitude and increase the throttle to a cruise RPM setting 8 >
Resume straight and level cruise

Notes:

Minimum recovery altitude is 1000 feet AGL, unless continuing to land at a suitable airport

Students should be able to recognize situations that require an emergency descent and execute it as necessary (ie: engine fires, medical emergencies, etc)

EMERGENCY APPROACH AND LANDING

References:

Airplane Flying Handbook, POH C182-SP, Private ACS & Commercial PTS

Description:

This maneuver simulates an approach and landing with an engine failure. Idle power is used and the airplane is flown at best glide speed to a suitable emergency landing area.

Objective:

Develop the pilot's ability to perform emergency approaches without power.

Procedure:

- 1 > The Instructor / Examiner reduces the throttle to idle
- 2 > Apply back pressure to maintain altitude until reaching best glide speed (68 KIAS at MTOW)
- 3 > While establishing glide speed, find a suitable emergency landing area
- 4 > Adjust trim to help maintain best glide speed
- 5 > Perform the appropriate emergency checklist (altitude allowing)
- 6 > Simulate a distress call and simulate setting 7700 on the transponder
- 7 > Plan to arrive abeam the intended landing point at approximately traffic pattern altitude
- 8 > Use flaps as required to increase or decrease gliding distance
- 9 > Prepare for landing

Notes:

Minimum recovery altitude is 500 feet AGL, unless continuing to land at a suitable airport.

Instructor / Examiner will clear the engine as required to prevent spark plug fouling