KT KILO TANGO AVIATION

CESSNA 172N PA24 CESSNA 182 STUDY GUIDE

IMPORTANT NOTICE

THIS is a GUIDE and is for reference use only

Refer to POH/AFM

Do not use procedures listed without referencing the full procedures described in the approved Owner's Manual, POH, or POH/AFM specific to the airplane you are flying. Endurance and fuel capacities may vary considerably depending on the specific model / serial number being flown and any modifications it may have.

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SECTION 1

CESSNA 172 N

Airworthiness and Registration certificates can be found on the forward lower left interior cabin wall. Weight and balance information can be found in the logbook.

PA24

Airworthiness and Registration certificates can be found in the baggage compartment. Weight and balance information can be found in the logbook.

Inoperative Instruments & Equipment per FAR 91.213

KTA aircraft do not operate under the guidance of a minimum equipment list (MEL). KTA aircraft operate in accordance with the following FAR 91.213 subpart. Because this is only an excerpt, the complete subpart should be referenced if necessary:

(3) The inoperative instruments and equipment are --

(i) Removed from the aircraft, the cockpit control placarded, and the maintenance recorded in accordance with §43.9 of this chapter; or

(ii) Deactivated and placarded "Inoperative." If deactivation of the inoperative instrument or equipment involves maintenance, it must be accomplished and recorded in accordance with part 43 of this chapter;

(4) A determination is made by a pilot, who is certificated and appropriately rated under part 61 of this chapter, or by a person, who is certificated and appropriately rated to perform maintenance on the aircraft, that the inoperative instrument or equipment does not constitute a hazard to the aircraft.

SECTION 2

Aircraft Systems

Cessna 172N

Engine

The Cessna 172 N models are equipped with a Lycoming, 4 cylinder, normally aspirated, carbureted , 320 cubic inch, horizontally opposed, air cooled, direct drive O-320-H2AD engine. The N model produces 160 HP @ 2700 RPM, Ignition is provided by 2 magnetos on the back of engine which provide spark to 8 spark plugs (2 per cylinder). The engine has an 6 quart oil sump. KTA minimum oil quantity for takeoff is 4 quarts.

Propeller

The engine drives a McCauley, 75inch 2 blade, all metal, fixed pitch propeller.

Vacuum System

An engine-driven vacuum system provides the suction necessary to operate the attitude indicator and directional indicator. The system consists of a vacuum pump mounted on the engine, a vacuum re- lief valve and vacuum air filter.

Landing Gear

The landing gear is a fixed, tricycle type gear consisting of tubular spring steel providing shock absorption for the main wheels, and an oleo (air/oil) strut providing shock absorption on the nose wheel. The nose strut extends in flight, locking it in place. The nose wheel contains a shimmy damper which damps nose wheel vibrations during ground operations at high speeds. The nose wheel is linked to the rudder pedals by a spring-loaded steering bungee which turns the nose up to 10° each side of center. Differential braking allows for up to 30° of steering either side of center.

Brakes

Brakes are hydraulically actuated, main wheel single-disc brakes controlled by master cylinders attached to both pilots' rudder pedals. When the airplane is parked, the main wheel brakes may be set by the parking brake handle beneath the left side instrument panel. To apply the parking brake, set the brakes with the rudder pedals, pull the handle aft and rotate it 90° down.

NOTE: The parking brake is not to be used in training or flight checks with KTA.

Flaps

The 172 has single slot type flaps driven electrically by a motor in the right wing. A flap position selector on the instrument panel has detents at the 0°, 10°, 20° 30° and 40° positions.

Pitot Static

The Pitot Static system consists of a pitot tube on left wing providing ram air pressure to the airspeed indicator, and a static port on the left side of the fuselage providing static pressure to the Altimeter, Vertical Speed Indicator and Airspeed Indicator. The pitot tube is electrically heated and an alternate static source is located under the instrument panel.

Fuel System

The Airplane is equipped with a standard fuel system 21.5 gals capacity per side. Three gallons unusable and a total capacity do 40 gals. The fuel system consists of two vented fuel tanks (one in each wing), a four-position selector valve, fuel strainer, manual primer, and carburetor.

Fuel flows by gravity from the two wing tanks to a four-position selector valve, labeled BOTH, RIGHT, LEFT, and OFF. With the selector valve in either the BOTH, LEFT, or RIGHT position, fuel flows through a strainer to the carburetor.

From the carburetor, mixed fuel and air flows to the cylinders through intake manifold tubes. The manual primer draws its fuel from the fuel strainer and injects it into the cylinder intake ports.

Fuel quantity is measured by two float-type fuel quantity transmitters (one in each tank) and indicated by two electrically-operated fuel quantity indicators on the left side of the instrument panel.

The fuel selector valve should be in the BOTH position for takeoff, climb, landing, and maneuvers that involve prolonged slips or skids. Operation from either LEFT or RIGHT tank is reserved for cruising flight.
R**eview the manual**

Electrical System

The airplane is equipped with a 28 volt DC electrical system and a 24 volt lead-acid battery. (N75754 IS 14 VOLTS 12 VOLTS BATT) Electrical energy is supplied by a 60 amp alternator located on the front of the engine. An external power receptacle is located on the left side of engine cowl.

Electrical power is distributed through electrical buses and circuit breakers. If an electrical problem arises, always check circuit breakers. “Essential” circuit breakers should be reset in flight only once, and only if there is no smoke or “burning smell”, and only if the affected system and equipment is needed for the operational environment. Do not reset any non-essential circuit breakers in flight.

Exterior Lighting

Exterior lighting consists of navigation lights on the wing tips and top of the rudder, a dual landing (inboard) / taxi (outboard) light configuration located on the left wing leading edge, a flashing beacon mounted on the top of the vertical fin, and a strobe light on each wing tip.

Environmental

Cabin heat is provided by air ducted through the exhaust shroud and into the cabin and is controlled by a knob on the instrument panel. Air flow is controlled by a Cabin Air knob on the instrument panel and additionally by ventilators near the top corners of both left and right windshields.

Stall Warning

A pneumatic type stall warning system consists of an inlet on the left wing leading edge, which is ducted to a horn near the top left of the windshield. As the aircraft approaches a stall, the lower pressure on top of the wing shifts forward drawing air through horn resulting in an audible warning at 5 to 10 knots above the stall.

Setting up the GPS for flight Cessna 172 N has a GNS 480 and a GNS 430W both GPS are WAAS Capable GPS.

COM AND NAV RADIO

COMM Radio (COM)

- Press COM to activate COM mode
- Turn Large knob to change MHz
- Turn small knob to change kHz
- Press ←→to toggle activation of auto squelch
- Press MON to monitor Standy frequency
- Press RCL to recall Recent stored Frequencies.
- Turn the Large knob to select frequencies
- Press Emergency to insert Emergency frequency on standby

What Video Demonstration click here

Setting the GPS for Navigation and Training

- Press D button
- Select DB mode
- Turn small Knob to change letters
- Big knob to change space
- KFTY as your waypoint
- Select Direct
- Select Enter Key
- Adjust Range to 15 nm using Big knob

What Video Demonstration click here

SECTION 3

Performance / Weight & Balance

V-Speeds (KIAS) & Limitations for All Single Engine Airplanes

Speeds listed below are in Knots Indicated Airspeed (KIAS).

City or Town	Cessna 172N	Cessna 182	PA24	Meaning	
Vso	41			Stall speed Landing configuration	
Vs	47	—		Stall speed TO Configuration	
Vx	59		—	Best Angle of Climb	
Vy	73			Best rate of Climb	
Vfe	85			Flaps operating speed	—
Va	97-80			Maneuvering Speed 2300lbs-1600lbs	
Vno	128			Max Structural Cruise Speed	
Vne	160			Never Exceed Speed	
Vlo	-			Landing Gear Operation Speed	
Vle	-			Landing Gear Extended Speed	
Max Xwind	15			Max Xwind	
Max Tailwind	-			Max Tail Wind	
Vglide	65			Best Glide Speed	
Max Window Open Speed	160			Max Window Operating Speed	

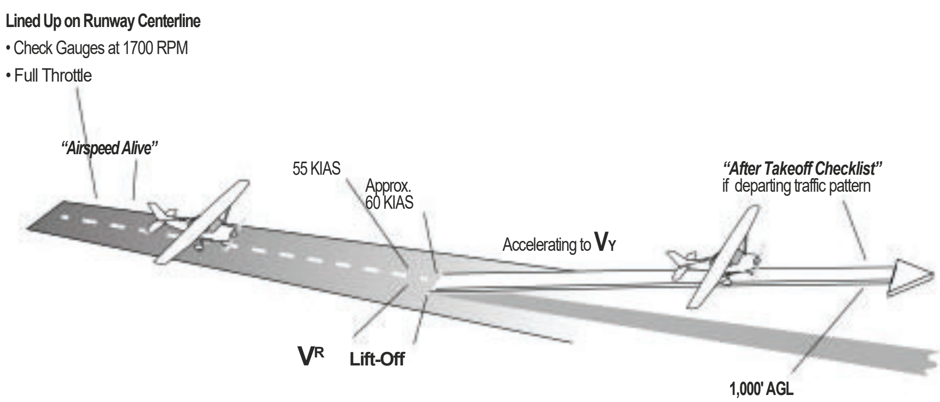
Departure Procedures

Normal Takeoff (Flaps 0˚)

Do not delay on runway.

1. Line up on centerline positioning controls for wind
3. Increase throttle to 1700 RPM
4. Check engine gauges
6. Increase throttle to full power
7. *"Airspeed Alive"*
8. Start slow rotation at 55 KIAS
   (Main gear should lift off at approx. 59 KIAS. 55 KIAS is V_R, not V_{LOF})
9. Accelerate to 73 KIAS (V_Y)
10. *"After Takeoff Checklist"* out of 1,000' AGL

Normal Takeoff Profile

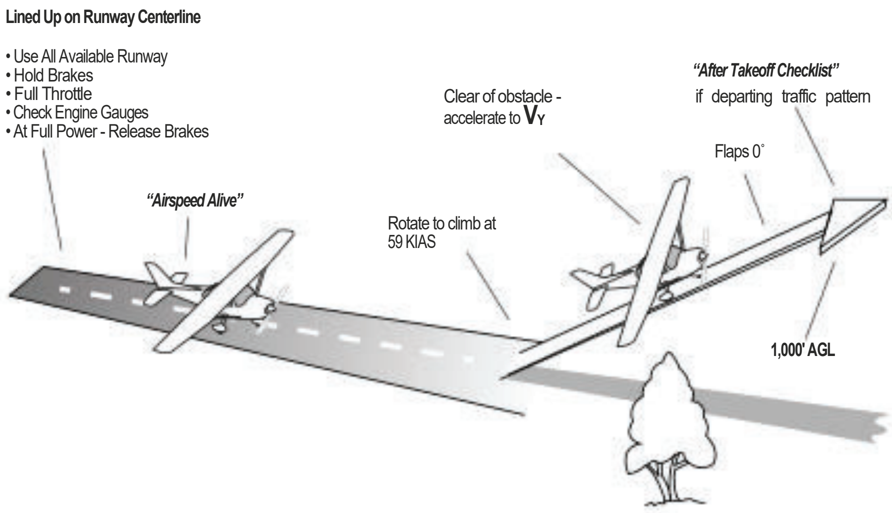


Short-Field Takeoff

1. Flaps 0°
2. Use all available runway
3. Hold brakes
4. Full throttle
5. Check engine gauges
6. At full power - release brakes
7. Rotate to climb at 59 KIAS over 50' obstacle
8. When clear of obstacle, accelerate V_Y

10. *"After Takeoff Checklist"* out of 1,000' AGL

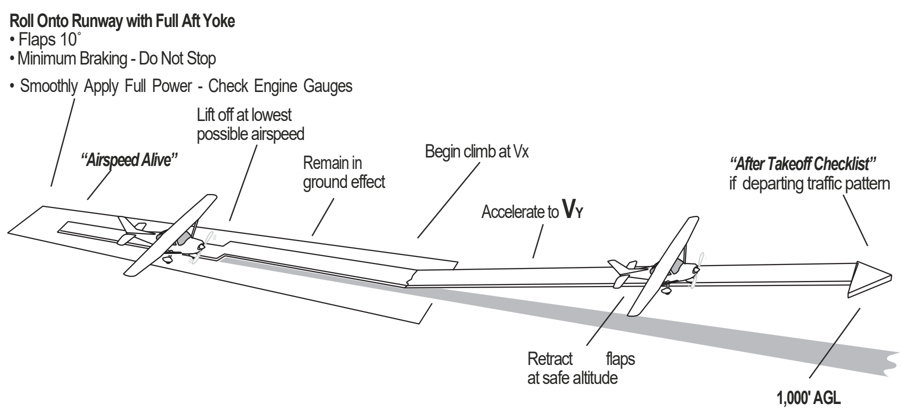
Short-Field Takeoff Profile



Soft-Field Takeoff

1. Flaps 10°
2. Roll onto runway with full aft yoke - minimum braking - do not stop
3. Smoothly apply full power - check engine gauges
4. As nose lifts off, ease back pressure
   (Nose wheel must remain off ground)
5. Lift off at lowest possible airspeed - remain in ground effect
6. In ground effect - accelerate to (V_X) - begin climb
7. Accelerate to (V_Y)
8. At safe altitude, retract flaps
9. *"After Takeoff Checklist"* out of 1,000' AGL

Soft-Field Takeoff Profile



EMERGENCY

Engine Failure or Abnormality During Takeoff Roll

THROTTLES .... CLOSE
STOP STRAIGHT AHEAD & AVOID OBSTACLES

Insufficient Runway for Complete Stop

MIXTURE .... CUTOFF
FUEL SHUTOFF VALVE .... OFF
BATTERY MASTER .... OFF
IGNITION SWITCH .... OFF
AVOID OBSTACLES

Engine Failure Immediately After Takeoff

MAINTAIN AIRCRAFT CONTROL
LAND ON REMAINING RUNWAY OR
WITHIN 30˚ OF CENTERLINE. AVOID OBSTACLES.
DO NOT ATTEMPT 180˚ TURN.
AIRSPEED ... LOWER NOSE & PITCH FOR BEST GLIDE
FLAPS .... AS REQ
POWER .... AS AVAILABLE
TIME PERMITTING ...... DECLARE AN EMERGENCY
FUEL SHUTOFF VALVE .... PULL OUT / OFF
IGNITION SWITCH .... OFF
FLAPS .... (40˚ Recommended) AS REQ
MASTER SWITCH .... OFF
DOORS .... UNLATCH

Engine Failure During Flight

AIRSPEED .... BEST GLIDE
NOTE WIND DIRECTION & SPEED
PICK & FLY TOWARDS LANDING SITE
FLAPS .... UP
MIXTURE .... RICH
FUEL SELECTOR VALVE .... BOTH
FUEL SHUTOFF VALVE .... PUSH IN / ON
AUX FUEL PUMP SWITCH .... ON
MAGNETOS .... CHECK ALL

If Prop Not Windmilling

IGNITION SWITCH .... START
MAGNETOS .... CHECK ALL

Cessna 172 Landing Criteria

- Plan and brief each landing carefully.
- Enter the traffic pattern at TPA trimmed for 90 KIAS in level flight. (Landing profiles depend on this.)
- Maintain a constant angle glidepath.
- Whenever possible, fly the traffic pattern at a distance from the airport that allows for a power off landing on a safe landing surface in the event of an engine failure.
- Maintain final approach speed until roundout (flare) at approx. 10' to 20' above the runway.
- Reduce throttle to touch down with the engine idling and the airplane at minimum controllable airspeed within the first 1,000’ of the runway.
- Touch down on the main gear, with the wheels straddling the centerline.
- Manage the airplane’s energy so touchdown occurs at the designated touchdown point.
- Maintain a pitch attitude after touchdown that prevents the nosewheel from slamming down by increasing aft elevator as the airplane slows.
- Maintain centerline until taxi speed is reached and increase crosswind control inputs as airplane slows.
- Adjust crosswind control inputs as necessary during taxi after leaving the runway.

Good Planning = Good Landing

A good landing is a result of good planning. When planning an approach and landing, decide on the type of approach and landing (visual or instrument, short-field, soft-field, etc.). Decide on the flap setting, the final approach speed, the aiming point, and where the airplane will touch down on the runway surface.

Approach Briefing - Verbalize the Plan

During the Approach Checklist, conduct an approach briefing. This organizes the plan and ensures effective communication between pilots. The briefing should be specific to each approach and landing, but presented in a standard format that makes sense to other pilots and instructors.

Planning considerations:

- Flap Setting
- Type of Approach & Landing (visual, instrument, short-field, soft-field)
- Landing Runway
- Field Elevation
- Traffic Pattern Altitude
- Winds (left or right crosswind? tailwind on downwind or base?)
- Final Approach Speed
- Aiming Point
- Touchdown Point

Example VFR Briefing

Review the flap setting, aiming point, and touchdown point when established on downwind.

> "This will be a normal landing. Aiming at the 3rd stripe before the 1,000' markings, touching down on the 1,000' markings.

This solidifies the plan between the student and instructor while visually indenting the aiming and touchdown points.

TIP: When approaching any airport for landing, have the airport diagram for available prior to landing and familiarize yourself with your taxi route based on your destination on the field and the landing runway.

Stabilized Approach

Definition: A stabilized approach is one in which the pilot establishes and maintains a constant angle glidepath towards a predetermined point on the landing runway. It is based on the pilot's judgment of certain visual cues, and depends on a constant final descent airspeed and configuration (FAA-H-8083-3A, p.8-7).

A stabilized approach is required during visual and instrument approaches in all KTA airplanes. The airplane must be stabilized by:

- 1,000' AGL for an ILS Approach
- Descending from MDA for a Non-Precision Approach
- 500' AGL for a Visual Approach

General Conditions for a Stabilized Approach

- Constant angle glidepath: Proper descent angle and rate of descent must be established and maintained. All available landing aids (ILS, VASI, PAPI, etc.) must be used. Non-precision approaches may require a slightly steeper angle until reaching MDA.
- Aircraft in final landing configuration (gear down and final flaps set).
- Airspeed must be stable and within range of target speed plus 10 KIAS.
- The aircraft will touch down in the first 1,000' of the landing runway. If this is not assured, a go-around must be executed.

Aiming Point

The Airplane Flying Handbook defines aiming point as "the point on the ground at which, if the airplane maintains a constant glidepath, and was not flared for landing, it would contact the ground."

AIM 2-3-3 - The "Runway Aiming Point Markings" consist of a broad white stripe located on each side of the runway centerline, approximately 1,000' from the landing threshold.

KTA requires all landings to occur within the first 1,000' of the landing runway. When flying a visual approach and landing in a C172, the (visual) aiming point chosen by the pilot is often an earlier point on the runway than the AIM defined "aiming point markings" to account for the flare. This technique ensures that the airplane touches down no farther than 1,000' down the runway.

Managing Energy

Managing energy means the pilot controls the airplane's glidepath, speed, and power setting so that altitude and airspeed are depleted simultaneously on the intended touchdown point.

Pitch & Power

Pitch

Maintain a constant angle glidepath to the aiming point by making pitch adjustments to keep the point stationary in the windshield. If the aiming point moves lower in the windshield, lower the pitch until the aiming point is back in the correct, stationary position. If the aiming point moves toward the top of the windshield, increase the pitch until the aiming point is back in the correct, stationary position.

TIP: During a visual approach and landing, if the airplane is trimmed for the correct approach speed with the correct power set, much of the pilot's attention can be on maintaining a constant angle glidepath to the aiming point. A majority of the pilot's scan should be outside the airplane, devoted to the aiming point and looking for traffic, with periodic instrument checks.

Power

During a stabilized approach and landing, use power to control deviations from the desired approach speed while maintaining a constant angle glidepath to the aiming point. If the airspeed is fast, reduce power while maintaining the constant angle glidepath. If the airspeed is slow, add power while maintaining the constant angle glidepath.

Since a constant angle glidepath is a requirement for a stabilized approach, airspeed deviations should be corrected by adjusting power. Changing pitch to correct airspeed deviations during a stabilized approach will cause an excursion from the constant angle glidepath, resulting in an unstable approach.

TIP: For training purposes landing is considered assured when the aircraft is lined up and will make the paved runway surface in the current configuration without power.

Go Around Philosophy

The decision to execute a go-around is both prudent and encouraged anytime the outcome of an approach or landing becomes uncertain. KTA considers the use of a go-around under such conditions as an indication of good judgement and cockpit discipline on the part of the pilot.

Instructors should vigilantly monitor student approaches and landing, and should command go-arounds if any of the stabilized approach conditions are not met. Instructors should make every effort to avoid allowing a student to take an unstabilized

approach close to the ground, requiring the instructor to take the controls and initiate a go-around.

Gust Factor

Slightly higher approach speeds should be used under turbulent or gusty wind conditions. Add ½ the gust factor to the normal approach speed. For example, it the wind is reported 8 gusting to 18 knots, the gust factor is 10 knots. Add ½ the gust factor, 5 knots in this example, to the normal approach speed.

Flap Setting

The C172 Operations Manual p. 4-32 states: “Normal landing approaches can be made with power on or power off with any flap setting desired. Surface winds and air turbulence are usually the primary factors in determining the most comfortable approach speeds.”

Students must be able to determine the best flap configuration and approach speed given the landing conditions.

At KTA, students are trained to land using the Standardized Flaps 40° Landing profile. When conditions are necessary for soft-field or short-field landing practice, those profiles should be used.

Seat Position

Correctly positioning the seat exactly the same for each flight improves landing performance and safety.

The fore-aft adjustment is correct when the heels are on the floor with the balls of the feet on the rudder pedals, not on the brakes. The feet should be at a 45° angle from the floor to the pedals and the pilot should be able apply full rudder inputs without shifting their body weight. When braking is required, lift the foot from the floor rather than keeping the leg suspended in the air or resting the feet on the upper portion of the pedals.

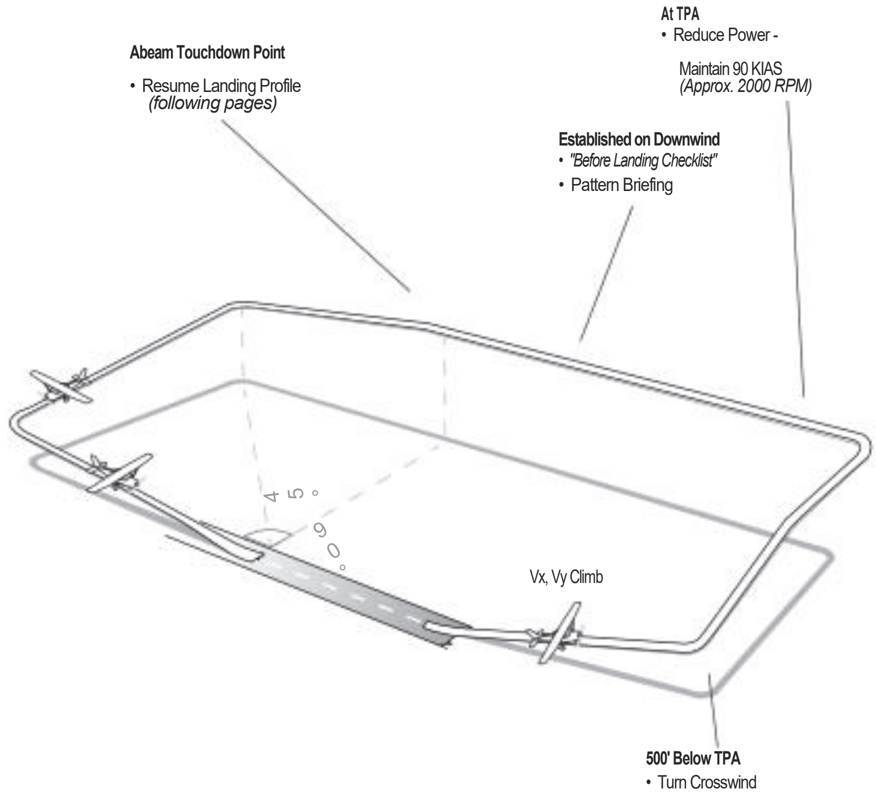
The seat height should be adjusted so the pilot can see the curvature of the cowling for the best sight picture during landing.

TIP: Proper foot position helps prevent inadvertent brake application during landings and ground operations.

Traffic Pattern Operations

Pattern Briefings should include:

- Flap Setting
- Type of Approach & Landing (Short-Field, Soft-Field, etc.)
- Final Approach Speed
- Aiming Point
- Touchdown Point



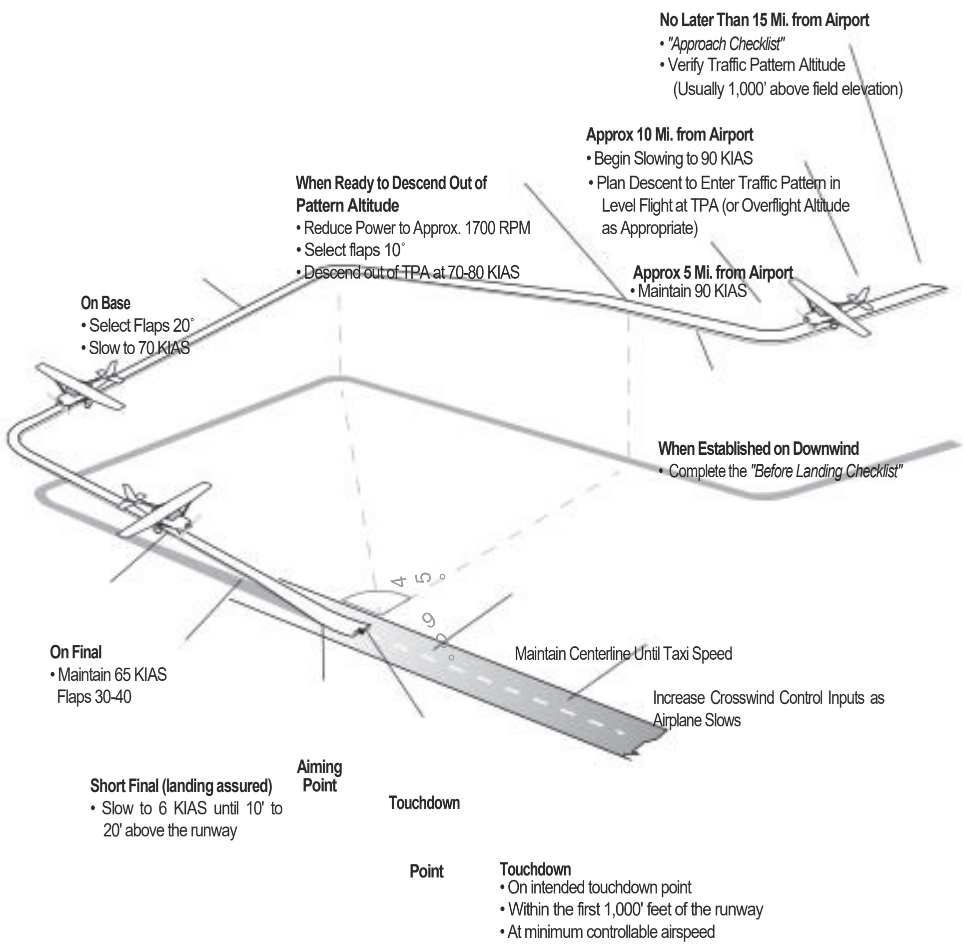
Standardized Flaps 40° Approach & Landing

1. Complete the "*Approach Checklist*" before entering the airport area; devote full attention to aircraft control and traffic avoidance
2. Slow to 90 KIAS prior to entering downwind or traffic pattern
3. Enter the traffic pattern at published TPA (typically 1,000' AGL)
4. Complete the "*Before Landing Checklist*" when established on downwind
5. When abeam touchdown point, on extended base, or on extended final (when ready to descend out of pattern altitude): Reduce power to approx. 1700 RPM and select flaps 10˚
6. Descend out of TPA at 70-80 KIAS
7. On base leg, select flaps 20° and slow to 70 KIAS
8. On Base to final select Flaps 30° and Slow to 65 KIAS
9. Maintain 65 KIAS until short final, Select Flaps 40°, when landing is assured, then slow to 60 KIAS until 10' to 20' above the runway

TIP: Getting ATIS, briefing the approach, and the Approach Checklist should be completed no later than 15 miles from the airport. Accomplishing these tasks as early as possible creates more time to focus on aircraft control and collision avoidance in the busy airport environment. During training flights when maneuvering near an airport, get ATIS, brief, and complete the Approach Checklist as soon as the decision is made to return to the airport. Don't wait!

FUEL SELECTOR .... ON
MIXTURE .... FWD
CARB HEAT (carbureted models) .... ON

Standardized 40˚ Flap Setting for C172 Landings Profile



TIP: The power settings in this supplement are approximate and can change depending on prevailing conditions. A common mistake is to spend too much time trying to set exact power settings. This diverts the pilot's attention from more important things. During landings, limit attention to the gauges to a few seconds at a time so ample attention remains on flying the proper course and glidepath.

No Flap Approach & Landing (ILS Approach)

A No flaps approach and landing will be accomplished the same as a standardized flaps 40° approach and landing with a few differences:

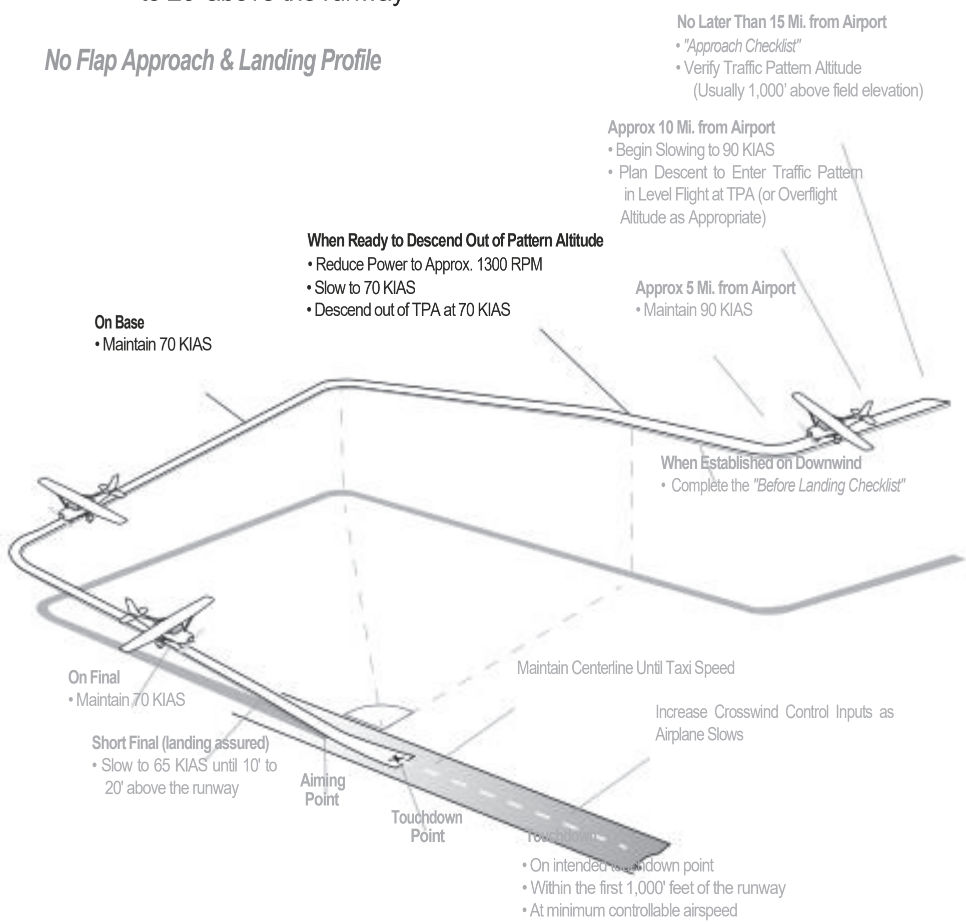
- Slow to 70 KIAS on base. Do not select flaps 20°.
- Maintain 70 KIAS until final when landing is assured, then slow to 65 KIAS until 10' to 20' above the runway.

No-Flap Approach & Landing

Steps 1-4 are identical to a normal approach and landing procedure.

5. When abeam touchdown point, on extended base, or on extended final (when ready to descend out of pattern altitude): Reduce power to approx. 1300 RPM
6. Slow to 70 KIAS
7. Descend out of TPA at 70 KIAS
8. Maintain 70 KIAS until landing is assured, then slow to 65 KIAS until 10' to 20' above the runway

No Flap Approach & Landing Profile



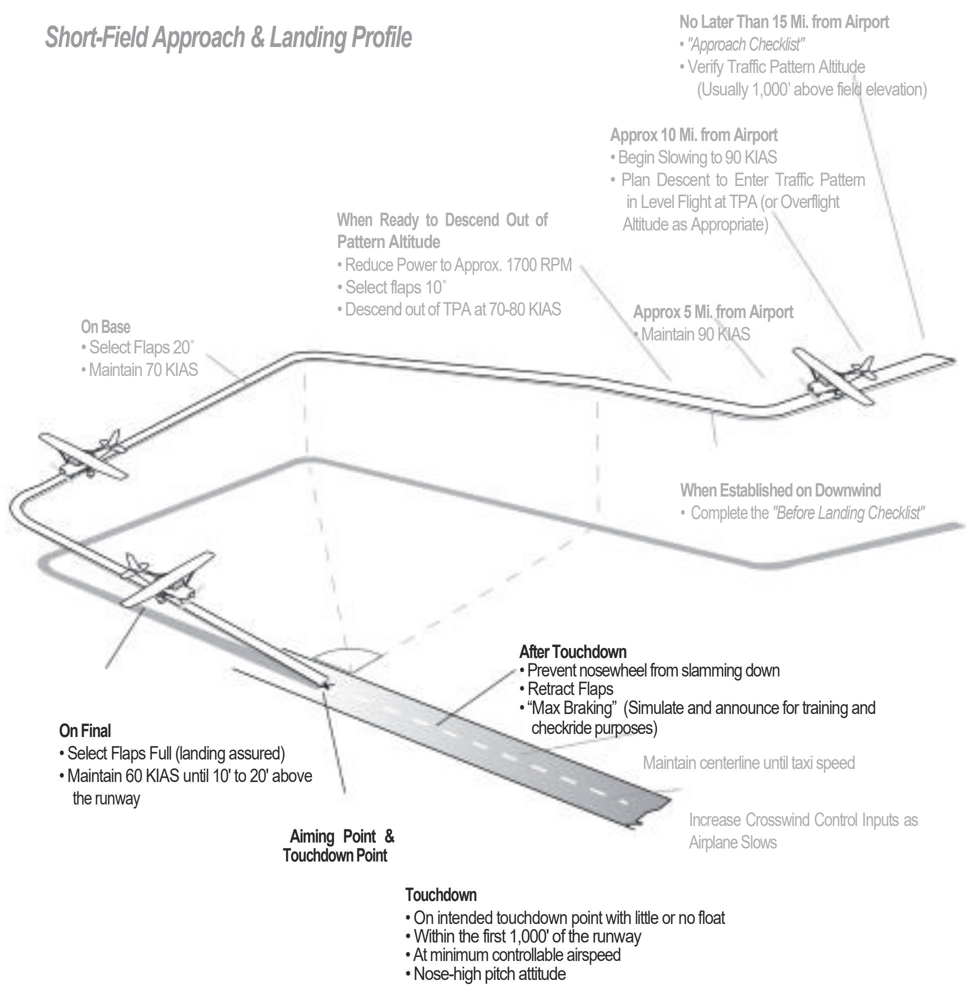
TIP: A no-flap approach has a different sight picture than a normal, flaps 40˚ approach. Don't add airspeed beyond profile speeds to compensate for the different sight picture. This will lead to excessive float in ground effect.

Short-Field Approach & Landing

Steps 1-7 are identical to a normal approach and landing procedure.

8. Select flaps FULL and slow to 60 KIAS on final when landing is assured
9. Close throttle slowly during flare - touch down on intended touchdown point with little or no floating
10. Prevent the nosewheel from slamming onto the runway
11. Retract the flaps after touchdown
12. Simulate and announce *"Max Braking"* for training and checkride purposes

Short-Field Approach & Landing Profile

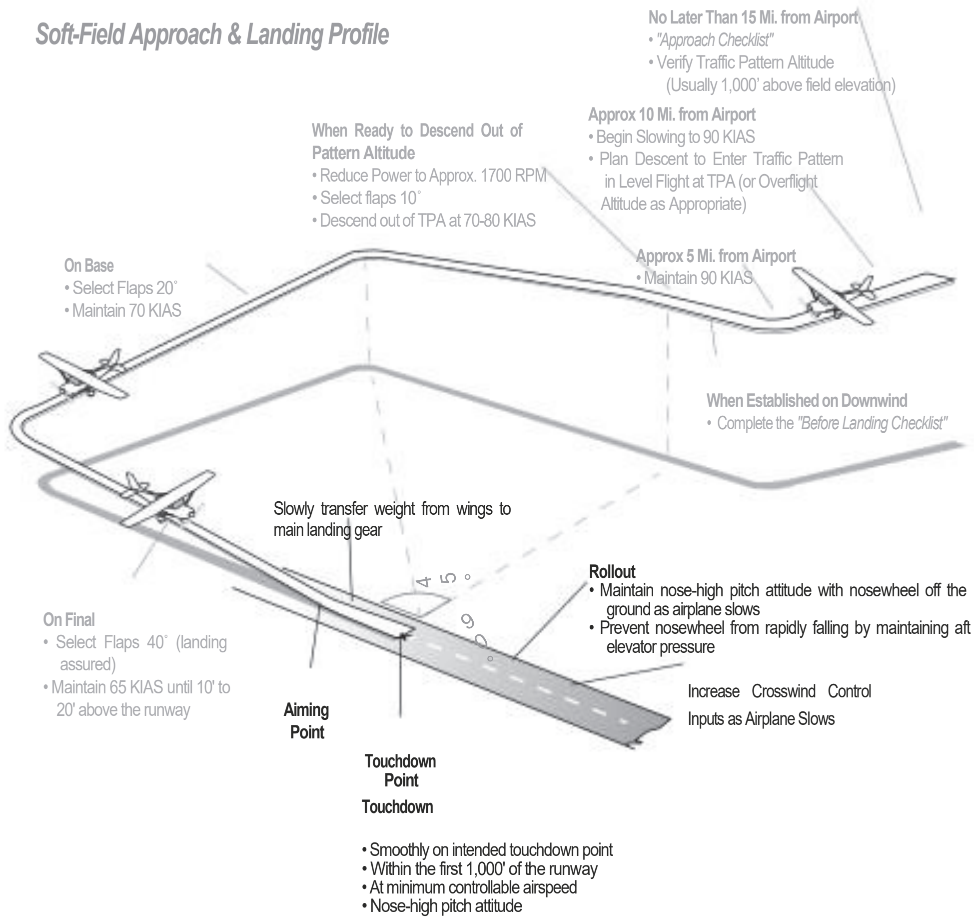


Soft-Field Approach & Landing

Steps 1-7 are identical to a normal approach and landing procedure.

8. On short final when landing is assured, select flaps 40° and slow to 65 KIAS
9. Fly the airplane onto the ground, slowly transferring the weight from the wings to the main landing gear
10. Touch down on intended touchdown point at minimum speed with a nose-high pitch attitude
11. Keep the nosewheel off the ground as airplane slows by increasing elevator pressure
12. Prevent nosewheel from rapidly falling by maintaining aft elevator pressure

Soft-Field Approach & Landing Profile



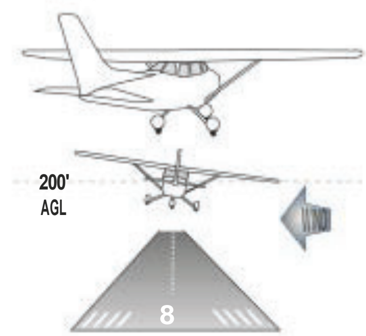
Crosswind Approach & Landing

Carefully planned adjustments must be made to the normal approach and landing procedure to safely complete a crosswind approach and landing.

Planning

Before entering the traffic pattern, brief how your approach and landing will be different by acknowledging the wind direction, crosswind component, planned flap setting, and how your traffic pattern ground track will differ as a result of the winds.

Ground Track



Plan a crab angle on downwind to maintain a uniform distance from the runway. Begin the base turn so the airplane is established on base at the appropriate distance from the runway. Do not allow the winds to blow the airplane off the intended ground track. Turning final, adjust for the winds to not over or undershoot the runway centerline.

Control Technique

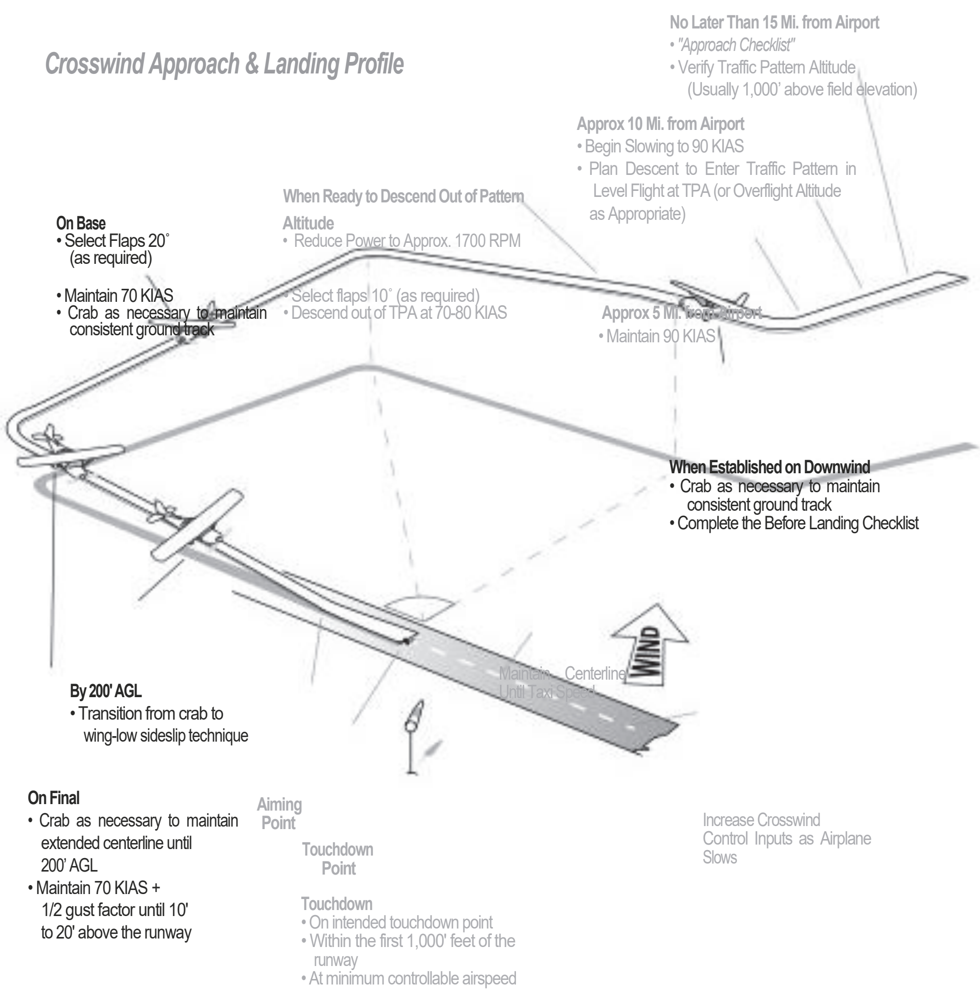
Establish a crab angle to maintain the proper ground track on final, then transition to the wing-low sideslip technique by no later than 200' AGL and below. Maintain the wing-low technique until touchdown and throughout the landing roll. After landing, increase aileron input into the wind as the airplane slows to prevent the upwind wind from rising, reduce side-loading tendencies on the landing gear, and minimize the risk of roll-over accidents due to the upwind wing lifting.

Judgment

The demonstrated crosswind component in the C172 is 15 knots. Regardless of reported winds, if the required bank to maintain drift control is such that full opposite rudder is required to prevent a turn toward the bank, the wind is too strong to safely land the airplane. Select another runway or airport and go-around any time the outcome of an approach or landing becomes uncertain.

TIP: During windy conditions, adjust turns in the traffic pattern as necessary to maintain the correct ground track and distance from the runway. For example, a strong tailwind during the downwind leg will blow the airplane too far from the runway if the pilot waits until the 45˚ point to turn base. Instead, plan the base turn early to remain the correct distance from the runway.

Crosswind Approach & Landing Profile



TIP: Develop the habit of applying full, proper crosswind control inputs as the airplane slows during every landing rollout and all taxi operations, regardless of how light the winds. Resist the tendency to release the control inputs to neutral after touchdown.

Go-Around

A go-around procedure must be initiated any time the conditions for a safe approach and landing are not met. Some examples of unsatisfactory approach and landing conditions are:

- Unstable approach path or airspeed.
- Improper runway alignment.
- Unexpected hazards on the runway or on final.
- Anything that jeopardizes a safe approach and landing.

Any time unsafe or unsatisfactory conditions are encountered, a go-around must be immediately executed and another approach and landing should be made under more favorable conditions.

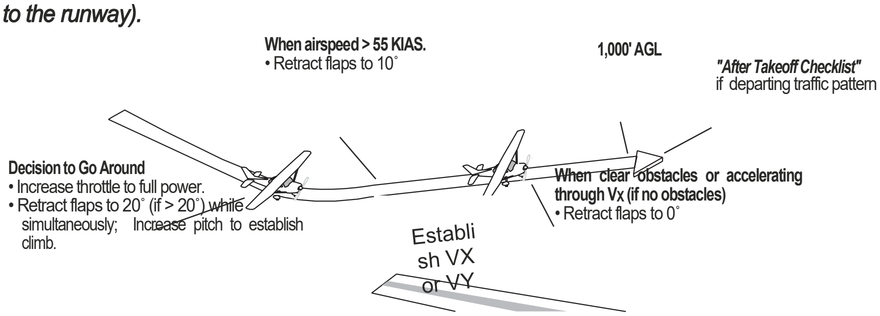
Missed Approach

A missed approach is a maneuver conducted by a pilot when an instrument approach cannot be completed to a landing. The pilot's initial actions when initiating a missed approach are the same as a go-around procedure.

Go-Around / Missed Approach Procedure

1. Increase throttle to full power
2. Retract flaps to 20° (if > 20°) while simultaneously;
3. Increase pitch to establish climb
4. Retract flaps to 10° when airspeed is greater than 55 KIAS
5. Establish V_X or V_Y as appropriate
6. Retract flaps to 0˚ at 65 KIAS and clear of obstacles
   (if no obstacles)
7. *"After Takeoff Checklist"* out of 1,000' AGL if departing the traffic pattern

If the go-around or missed approach is due to conflicting traffic, maneuver as necessary during the climb to clear and avoid conflicting traffic (usually to the side, flying parallel to the runway).



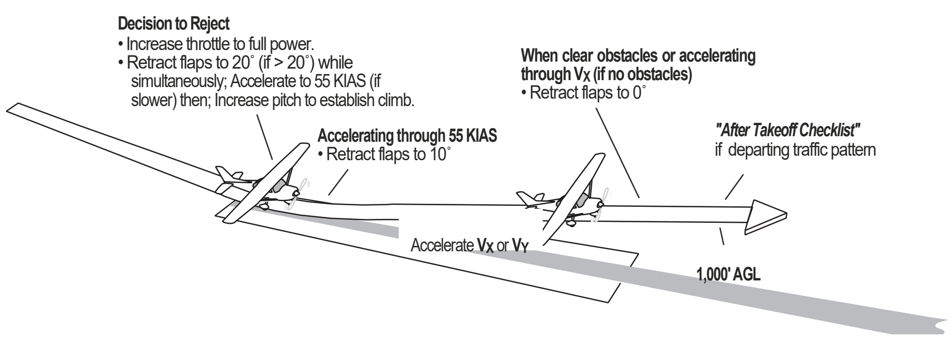
Rejected or Balked Landing

A rejected or balked landing occurs when the airplane is very low to the ground and usually occurs after the roundout (flare) has begun. Airspeed may be very low - well below V_X or V_Y in some cases - and the pilot must be very careful to establish and maintain a safe airspeed during the transition to a climb. At slow airspeeds, retracting the flaps too early or abruptly can result in a significant loss of lift. The pilot must also factor in ground effect when initiating a rejected or balked landing close to the ground.

Rejected or Balked Landing Procedure

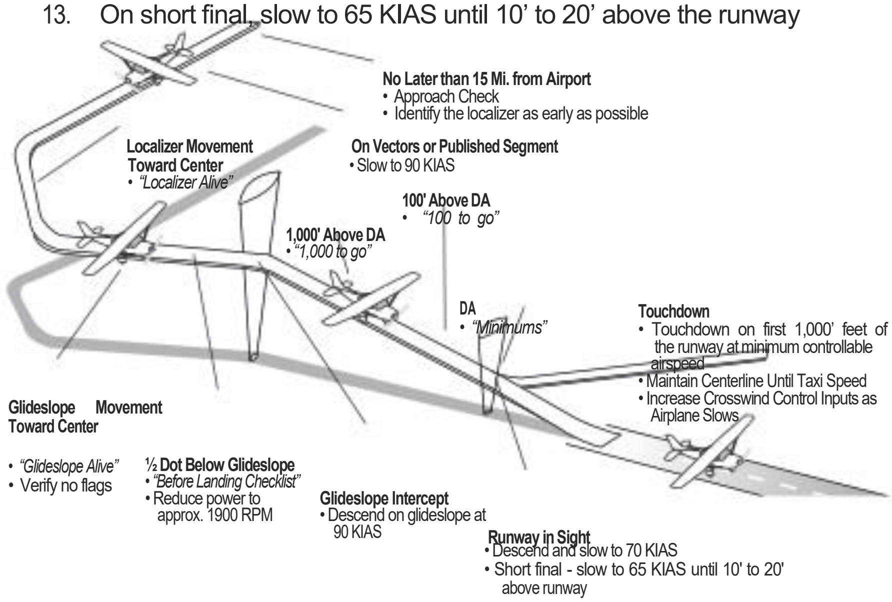
1. Increase throttle to full power
2. Retract flaps to 20° (if > 20°) while simultaneously;
3. Accelerate to 55 KIAS (if slower) then;
4. Increase pitch to establish climb
5. Retract flaps to 10° accelerating through 55 KIAS
6. Accelerate to V_X or V_Y as appropriate
7. Retract flaps to 0˚ when clear obstacles or accelerating through V_X *(if no obstacles)*
8. *"After Takeoff Checklist"* out of 1,000' AGL if departing the traffic pattern

If the rejected landing is due to conflicting traffic, maneuver as necessary during the climb to clear and avoid conflicting traffic (usually to the side, flying parallel to the runway.



Precision Approach (ILS Approach)

1. Complete the *"Approach Checklist"* and identify the localizer as early as possible
2. Slow to 90 KIAS on vectors or when final approach course inbound
3. Announce *"Localizer Alive"* when localizer begins moving toward center
4. Announce *"Glideslope Alive"* when glideslope begins moving toward center
5. Verify no flags at glideslope intercept altitude and marker 1⁄2
6. dot below glideslope intercept: *"Before Landing Checklist"*
7. Reduce power to approx. 1900 RPM.
8. Descend on glideslope at 90 KIAS.
9. Announce at 1,000' above DA: *"1,000 to go"*
10. Announce at 100' above DA: *"100 to go"*
11. *"Minimums"*
12. Runway in sight: descend and slow to 70 KIAS
13. On short final, slow to 65 KIAS until 10' to 20' above the runway



TIP: The airplane is considered established inbound when the localizer is alive.

Non-Precision Approach (GPS, VOR, LOC Approach)

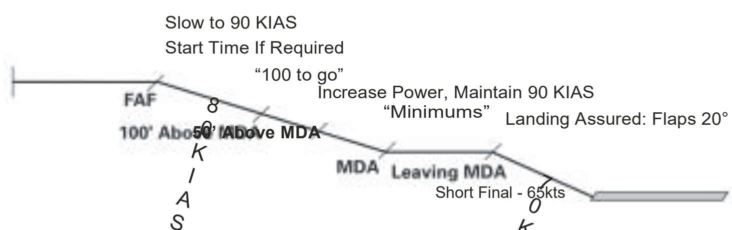
1. Load the approach into the GPS, and select appropriate nav source, and frequency if required.

Within 30 NM of the airport, if flying a GPS approach, the GPS will display "Apch Arm" or “TERM.”

2. Set the desired course on the Nav 1 OBS.
3. Complete the *"Approach Checklist."*
4. Slow to 90 KIAS when on a published segment of the approach or if on vectors.

At 2 NM prior to the FAF on a GPS approach, verify green APCH ACTV or APCH flag on GPS. If no flag appears, DO NOT DESCEND at the FAF.

5. At FAF, complete *"Before Landing Checklist"* -- Slow to 90 KIAS. Start time if required.
6. Descend at 400-500 FPM (unless steeper descent required) at 90 KIAS.
7. Announce at 100' above minimums: "100 to go."
8. Increase power 50’ prior to reaching MDA to maintain 80 KIAS at level off.
9. *"Minimums."*
10. Maintain MDA (plus 50', minus 0').
11. Runway in sight: descend at predetermined VDP or maintain MDA to MAP.
12. Do not leave MDA until landing is assured.
13. When descending from MDA: Flaps 20° - 70 KIAS.
14. On short final, slow to 65 KIAS until 10’ to 20’ above the runway.



Circling Approach

When conducting a circling approach, fly the normal approach profile to the published circling minimums (precision or non-precision).

Maintain circling minimums at 80 KIAS until in a position from which a normal landing can be made.

When descending from MDA (circling minimums), select flaps 20˚ and slow to 70 KIAS. On short final, slow to 65 KIAS until 10' to 20' above the runway.

SECTION 6

In-Flight Maneuvers

Required maneuvers for the Commercial Pilot Single-Engine Add-On are performed the same as those for Private Pilot, with two exceptions:

Commercial steep turns are accomplished with at least 50° of bank.

- Commercial slow flight is performed at an airspeed at which any further increase in angle of attack, increase in load factor, or reduction in power, would result in an immediate stall.

Commercial Pilot Single Engine Add-On completion standards allow for lower tolerances than Private Pilot standards on maneuvers. Refer to the PTS.

Clean Configuration Flow

1. Fuel selector - both
2. Mixture - enrichen
3. Flaps 0°

Landing Configuration Flow

1. Fuel selector - both
2. Mixture - enrichen
3. Carburetor heat - on (carbureted models)
4. Flaps full

PVT Steep Turns

Steep turns are to be accomplished above 3,000' AGL. Roll into one coordinated 360˚ turn, then follow with another coordinated 360˚ turn in the opposite direction. Roll into and out of turns at approximately the same rate.

1. Perform two 90° clearing turns
2. 90 KIAS (2000 RPM) maintain altitude
3. Cruise configuration flow
4. Perform a 360 turn with 45° of bank
5. Maintain altitude and airspeed (+ back pressure, + approx. 1-200 RPM)
6. Roll out ½ bank angle prior to entry heading
7. Clear traffic and perform a 360° turn with 45° of bank in the opposite direction
8. Roll out ½ bank angle prior to entry heading
9. *"Cruise Checklist"*

PRACTICAL TEST	Airspeed	Altitude	Bank	Heading
	±10 KIAS	±100'	45° ±5°	±10°

PVT Maneuvering During Slow Flight

Slow flight is to be accomplished at an entry altitude that will allow completion above 1,500' AGL. 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.

1. Perform two 90° clearing turns
2. 1700 RPM (maintain altitude)
3. Landing configuration flow
4. Maintain altitude - slow to 5-10 knots above 1G stall speed (approximately 45-50 KIAS). Avoid stall warning activation.
5. Power as required to maintain airspeed
6. Accomplish level flight, climbs, turns, and descents as required *KTA - max 30° bank*
7. Recover - max power/maintain altitude/reduce flaps.
8. Above V_X, retract flaps to 0°
9. *"Cruise Checklist."*

PRACTICAL TEST	Airspeed	Altitude	Bank	Heading
	+10/-0 KIAS	±100'	±10°	±10°

PVT Power-Off Stall

Stalls are to be accomplished at an entry altitude that will allow completion no lower than 1,500' AGL. This maneuver is begun by first establishing a stabilized descent in either the approach or landing configuration.

1. Perform two 90° clearing turns
2. 1700 RPM (maintain altitude)
3. Landing configuration flow
4. Stabilized descent at 65 KIAS
5. Throttle idle (slowly)
6. Wings level or up to 20° bank as assigned
7. Maintain altitude to induce stall
8. Recover - simultaneously reduce AOA, max power, and level wings
9. Retract flaps to 20° (immediately)
10. Retract flaps to 10° when airspeed is greater than 55 KIAS
11. Increase pitch to arrest descent
12. Establish V_X or V_Y as appropriate
13. Retract flaps to 0° when accelerating through V_X
14. *"Cruise Checklist."*

PRACTICAL TEST	*Bank*	*Heading*
	±10° *Not to exceed 20°*	±10°

PVT Power-On Stall

Stalls are to be accomplished at an entry altitude that will allow completion no lower than 1,500' AGL.

1. Perform two 90° clearing turns
2. 1700 RPM (maintain altitude)
3. Clean configuration flow
4. At 60 KIAS, simultaneously increase pitch (slowly) and apply full power
5. Increase pitch attitude to induce stall
6. At stall/buffet (as required) recover - simultaneously reduce AOA, max power, and level wings
7. *"Cruise Checklist"*

PRACTICAL TEST	*Bank*	*Heading*
	±10° *Not to exceed 20°*	±10°

PVT Emergency Descent

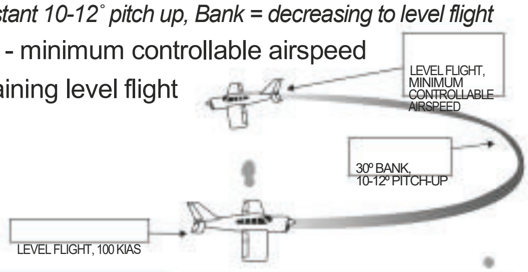
During a simulated emergency descent, the applicant must be able to recognize situations requiring an emergency descent, such as cockpit smoke and/or fire. Situational awareness, appropriate division of attention, and positive load factors should be maintained during the maneuver and descent.

1. Perform two 90° clearing turns
2. Clean configuration flow
3. Reduce throttle to idle
4. Initiate turning descent, while clearing for traffic
5. Maintain (training) 120 KIAS
6. Notify ATC/Traffic as appropriate

COM Chandelles

Chandelles are to be accomplished at an entry altitude that will allow completion no lower than 1,500' AGL, and consist of one maximum performance climbing turn beginning from straight-and-level flight, and ending at the completion of a precise 180° turn in a wings-level, nose-high attitude at the minimum controllable airspeed.

1. Perform two 90° clearing turns
2. 100 KIAS (2200 RPM) maintain altitude
3. Clean configuration flow
4. Choose a reference point off wing
5. Establish / maintain 30° bank
6. Full Throttle - Increase pitch to attain approx. 10-12° pitch up at 90° point
   1st 90° of turn, Bank = constant 30˚, Pitch = increasing to 10-12˚ pitch up
7. 90° point - maintain pitch - reduce bank angle to attain level flight at 180˚ point
   2nd 90° of turn, Pitch = constant 10-12˚ pitch up, Bank = decreasing to level flight
8. 180° point - wings level - minimum controllable airspeed
9. Accelerate while maintaining level flight
10. *"Cruise Checklist"*



PRACTICAL TEST	*Airspeed*	*Heading*
	Just above stall	Rollout at 180° point ±10°

Answer The Following Sample Oral Questions Prior To Arriving For Training

1. (True/False) Engines on all KTA C172s are identical.
2. Identify the range of useable fuel (smallest to largest) available in the KTA C172 fleet.
3. Where (within the POH/AFM) can information on engine modifications be found?
4. Be able to identify the various engine sizes and specifications for the various model C172s.
5. What type of flaps does the C172 have?
6. Describe the C172 landing gear.
7. Describe the differences between early and late model electrical systems.

8. Describe the ignition system.
9. What type of stall warning system does the C172 have?
10. (True / False) There are different checklists for early and late model C172s.
11. Describe the differences between early and late model fuel systems.
12. By memory, be able to recite and write down all of the profiles contained in this supplement and on the C172 Maneuver Guide.
13. What is the first step in accomplishing a good landing?
14. Whenever possible, what distance should the traffic pattern be flown in a single-engine airplane?
15. For training and testing purposes, what speed should the airplane be flown on short final when landing is assured?
16. What is the typical approximate altitude above the landing surface to begin the roundout (flare)?
17. At what speed should the touchdown occur in a 172?
18. Define “managing energy”.
19. After landing, how long should the centerline be maintained?
20. After touchdown, what should be done with the aileron controls as the airplane slows? Why?
21. What information should a visual approach briefing include?
22. What does an approach briefing accomplish?
23. Be able to articulate an example visual approach and landing briefing using the example provided in the Supplement.
24. Define stabilized approach according to the Airplane Flying Handbook.
25. What are the general conditions for a stabilized approach?
26. What should a pilot do if the general conditions for a stabilized approach don’t exist during an approach? What if an instructor is on board?
27. What is, in your opinion, the most important part of a stabilized approach?
28. What action should be taken if a pilot at 1,000’ AGL maintaining a constant angle glidepath is 10 knots too fast?
29. While maintaining a stabilized approach, what control input should the pilot use to correct for airspeed deviations, change the pitch or change the power?
30. Define “aiming point” according to the airplane flying handbook.

31. While maintaining a stabilized approach, what control input should the pilot use to correct for the aiming point moving up in the windshield, change the pitch or change the power?
32. If the aiming point is moving up in the windshield, is the airplane moving lower or higher reference the constant angle glidepath?
33. What does it mean if a pilot flying in level flight has to physically keep the airplane from climbing by applying forward pressure on the yoke?
34. What does it mean if a pilot flying in level flight has to physically keep the airplane from descending by applying aft pressure on the yoke?
35. According to Cessna, what is the best flap setting for a normal landing a C172?
36. How should the approach speed be adjusted for gusty winds?
37. Calculate the correct approach speed until short final given the following conditions.
    - Flaps 20˚
    - Winds 240 @ 8, gusting to 18
38. Why is correctly adjusting the seat position before each flight important?
39. When should the pilot get ATIS, brief the approach, and complete the Approach Checklist?
40. Are the power settings listed on the landing profiles exact or approximate?
41. Is the aiming point also the touchdown point? If not, what is the difference?
42. What is the maximum recommended flap setting for crosswinds?
43. Does KTA recommend the crab method or wing-low sideslip method during a crosswind approach and landing?
44. When using the wing-low sideslip technique, will left or right rudder be required during a strong right crosswind?
45. Which control surface, aileron or rudder, corrects for wind drift during a crosswind landing?
46. During crosswind landings, which control surface, aileron or rudder longitudinally aligns the airplane with the runway centerline?
47. What is the max demonstrated crosswind in the C172?

48. When flying the downwind leg with a strong tailwind, where should the turn to base be started?
    - At the 45° angle to the intended touchdown point
    - Plan the turn early so the base leg can be flown at the appropriate distance from the runway
    - Plan the turn late so the base leg can be flown at the appropriate distance from the runway
49. What control inputs, if any, should the pilot apply after the airplane touches down?
50. What is the difference between a go-around/missed approach and a rejected landing?
51. During an ILS approach, when is the airplane considered established inbound?