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PA31-350 NAVAJO FLIGHT MANEUVERS

REVISIONS

It is the responsibility of the Director of Operations or Chief Pilot to keep the PA-31 Navajo Maneuvers current.

All revisions will be submitted to the FAA for approval prior to being implemented.

Revision control is accomplished in the upper right-hand corner of each page. The following is an explanation of the terms found:

Page 1 Original 12-21-23

1	Represents Page 1.
Original	Represents Original document (not yet revised)
12-21-23	Represents the date the original document (or revision) became effective.

LOG OF REVISIONS

Rev. No.	Date	Page Numbers	Initials
Original	12-21-23	All	

EFFECTIVE PAGES

This list shows the current revision and effective date of each page.

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James Howery, POI

JAMES M HOWERY
Digitally signed by JAMES M HOWERY
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USE OF THE FLIGHT MANEUVERS

The flight maneuvers contained herein are designed to support the flight training curriculum segment. The procedures established for each maneuver are designed to standardize company flight training.

All crewmembers are expected to demonstrate knowledge and proficiency in each maneuver (both ground & flight) listed in the flight training curriculum segment in accordance with the standards set forth in the applicable Airman Certification Standards guide.

Instructors are expected to carry a copy of the Airman Certification Standards (appendix E) while conducting flight training. The flight training maneuvers do not replace the published performance and operating limitations of the airplane as found in the Piper PA31-350 Pilot's Operating Handbook. Reference speeds should be confirmed by consulting the assigned aircraft's POH.

Each flight training session is to be preceded and followed by an instructor briefing and appropriate critique. Except for single engine maneuvering, all inflight maneuvers should be completed above 3,000' AGL and the pilot and instructor will maintain external vigilance and perform clearing turns prior to initiating the maneuver. All single-engine maneuvers such as engine shutdown or VMC demonstrations will be performed at or above 5000' AGL. Instructors will also emphasize use of appropriate checklists and single or multi-crewmember resource management.

During operations in cold weather all power changes should be gradual. To prevent shock cooling and possible cylinder cracking avoid sudden large decreases in power. If necessary begin descents earlier than normal to allow gradual power reductions.

PA31-350 V-SPEEDS (KIAS at gross weight with BLR vortex generators)

Vso	67	Stall speed, landing configuration @ 7000 lbs. full flaps, gear down, power off
Vx	84	Best angle climb, 0° flaps
Vy	101	Best rate climb, 0° flaps
Va	159	Maneuvering speed
Vfe	152	Max speed flap extended 15° - 25°
Vfe	132	Max speed flaps extended 40°
Vie	153	Max gear extension/extended speed
Vlo	128	Max gear retraction speed
Vmc	72	Minimum control speed with critical engine inoperative red line
Vmc15	67	Minimum control speed with critical engine inoperative & Flaps 15°
Vyse	107	Best rate of climb single engine blue line
Vno	185	Max structural cruise speed
Vne	236	Never-exceed speed

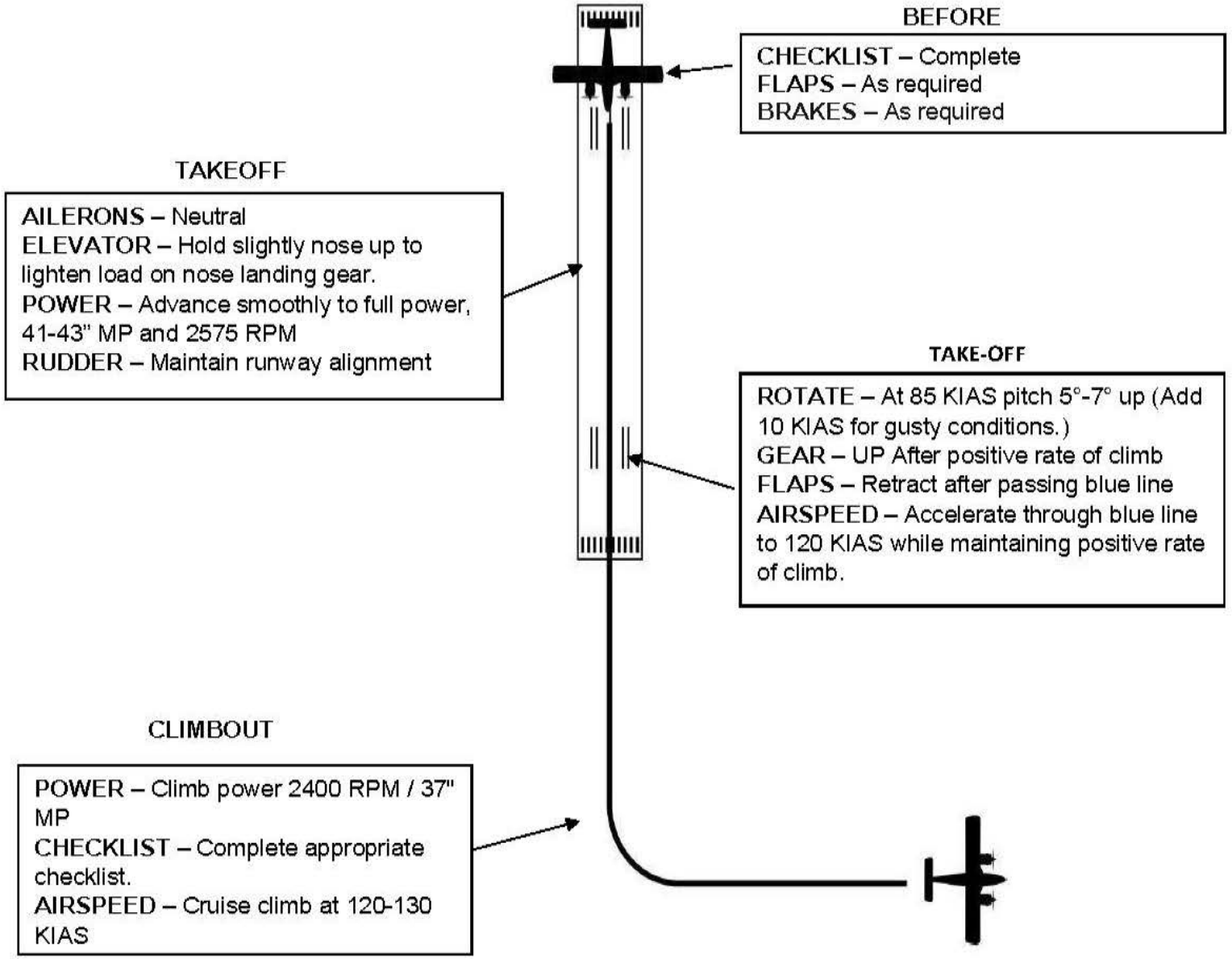
BEFORE TAKEOFF

The following procedures are applicable to all takeoff maneuvers:

Checklist	Complete Final Items checklist
Approach zone	Verify clear before taxiing into position on runway.
Runway	Align with centerline and crosscheck headings

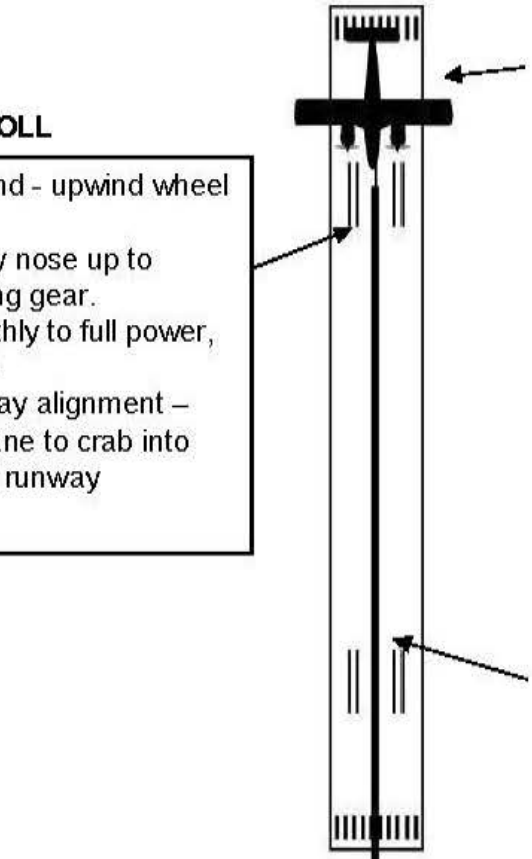
NORMAL TAKEOFF

The purpose is to make a smooth transition from ground roll to flight on a hard surface or paved runway, with sufficient length for gradual acceleration to normal liftoff and climb speed, assuming a headwind or no wind, and no obstacles along the takeoff path.



CROSSWIND TAKEOFF

The purpose of this type of takeoff is to coordinate correct use of flight controls and assure a safe and smooth transition from ground roll to flight in crosswind conditions. Maximum demonstrated crosswind component is 20 knots.



BEFORE TAKEOFF

CHECKLIST – Complete
FLAPS – As required
BRAKES – As required

TAKEOFF ROLL

AILERONS – Hold into wind - upwind wheel leaves ground last.
ELEVATOR – Hold slightly nose up to lighten load on nose landing gear.
POWER – Advance smoothly to full power, 41-43" MP and 2575 RPM
RUDDER – Maintain runway alignment – When airborne allow airplane to crab into wind to maintain extended runway centerline.

TAKE-OFF

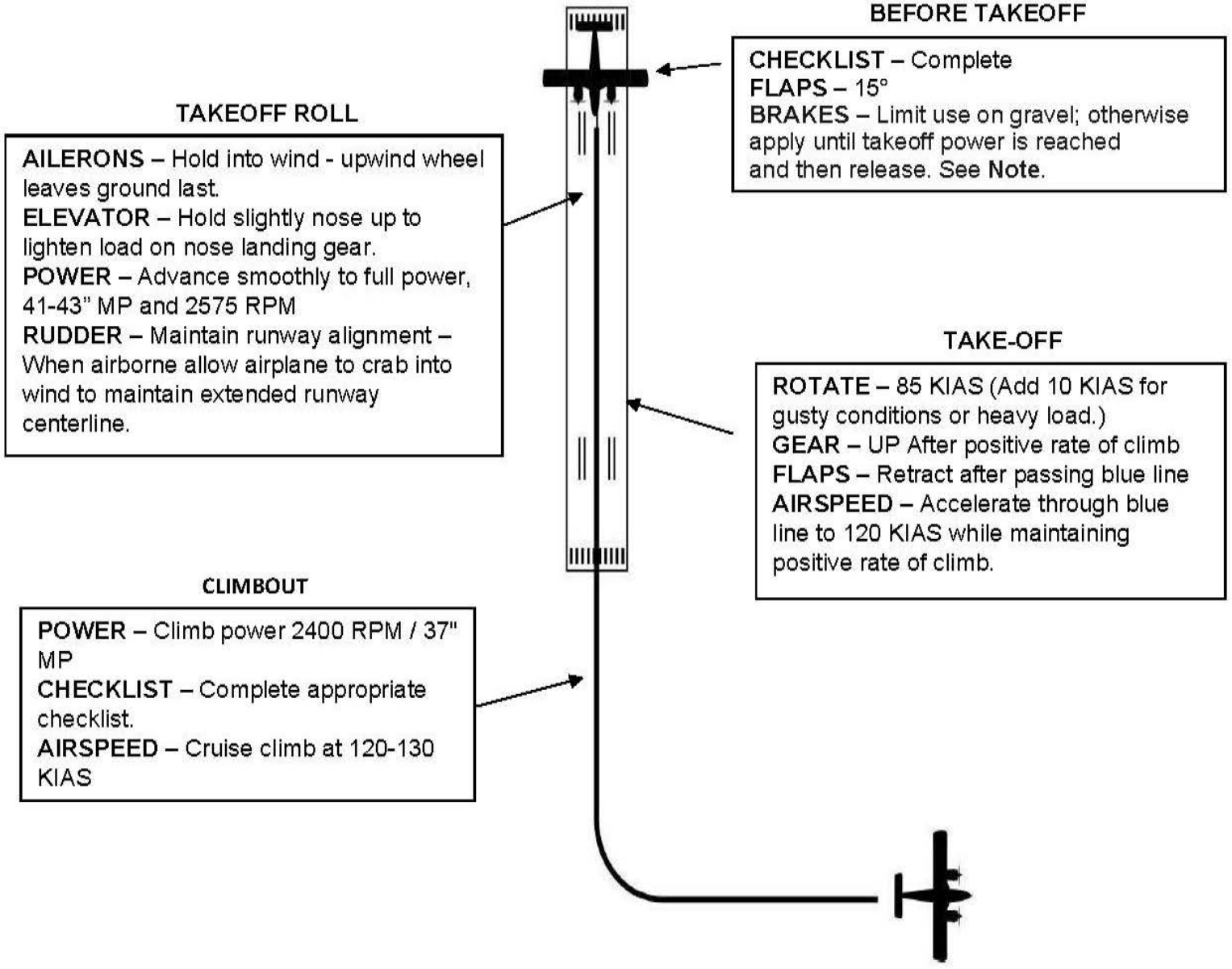
ROTATE – 85 KIAS (Add 10 KIAS for gusty conditions or heavy load.)
GEAR – UP After positive rate of climb
FLAPS – Retract after passing blue line
AIRSPEED – Accelerate through blue line to 120 KIAS while maintaining positive rate of climb.

CLIMBOUT

POWER – Climb power 2400 RPM / 37" MP
CHECKLIST – Complete appropriate checklist.
AIRSPEED – Cruise climb at 120-130 KIAS

SHORT FIELD TAKEOFF

The purpose of this type of takeoff is to get airborne with the shortest take off roll distance due to a limited runway length or obstacles in the immediate takeoff path and once airborne climb at the best angle of climb until obstacles are cleared.



BEFORE TAKEOFF

CHECKLIST – Complete
FLAPS – 15°
BRAKES – Limit use on gravel; otherwise apply until takeoff power is reached and then release. See **Note**.

TAKEOFF ROLL

AILERONS – Hold into wind - upwind wheel leaves ground last.
ELEVATOR – Hold slightly nose up to lighten load on nose landing gear.
POWER – Advance smoothly to full power, 41-43" MP and 2575 RPM
RUDDER – Maintain runway alignment – When airborne allow airplane to crab into wind to maintain extended runway centerline.

TAKE-OFF

ROTATE – 85 KIAS (Add 10 KIAS for gusty conditions or heavy load.)
GEAR – UP After positive rate of climb
FLAPS – Retract after passing blue line
AIRSPEED – Accelerate through blue line to 120 KIAS while maintaining positive rate of climb.

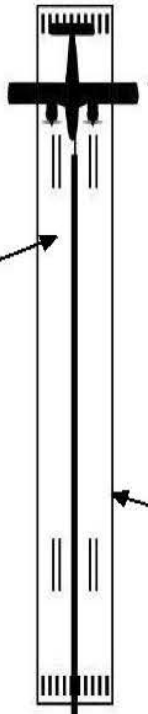
CLIMBOUT

POWER – Climb power 2400 RPM / 37" MP
CHECKLIST – Complete appropriate checklist.
AIRSPEED – Cruise climb at 120-130 KIAS

Note: If runway is gravel use brakes enough to allow the aircraft to roll slowly until 30" MP is reached then fully release brakes and set maximum takeoff power. Experience has shown as long as the aircraft has some movement the propellers generally do not pick-up gravel. When taxiing on gravel runways pilot should be aware of wind direction and velocity at all times. When taxiing with a tailwind component pilots should use as little power as possible and make every attempt not to stop aircraft prior to beginning the takeoff roll. It may be necessary to complete the runup at a reduced power setting or while taxing.

ROUGH FIELD TAKEOFF

The purpose of this type of takeoff is to reduce pressure on the landing gear and minimize potential damage caused by the rough surface of the runway and to get airborne with the minimal take off roll distance due to a limited runway length or obstacles in the immediate takeoff path and once airborne climb at the best angle of climb until obstacles are cleared.



BEFORE TAKEOFF

CHECKLIST – Complete
FLAPS – 15°
BRAKES – Limit use on gravel; otherwise apply until takeoff power is reached and then release. See note.

TAKEOFF ROLL

AILERONS – Hold into wind - upwind wheel leaves ground last.
ELEVATOR – Hold slightly nose up to lighten load on nose landing gear.
POWER – Advance smoothly to full power, 41-43" MP and 2575 RPM
RUDDER – Maintain runway alignment – When airborne allow airplane to crab into wind to maintain extended runway centerline.

TAKE-OFF

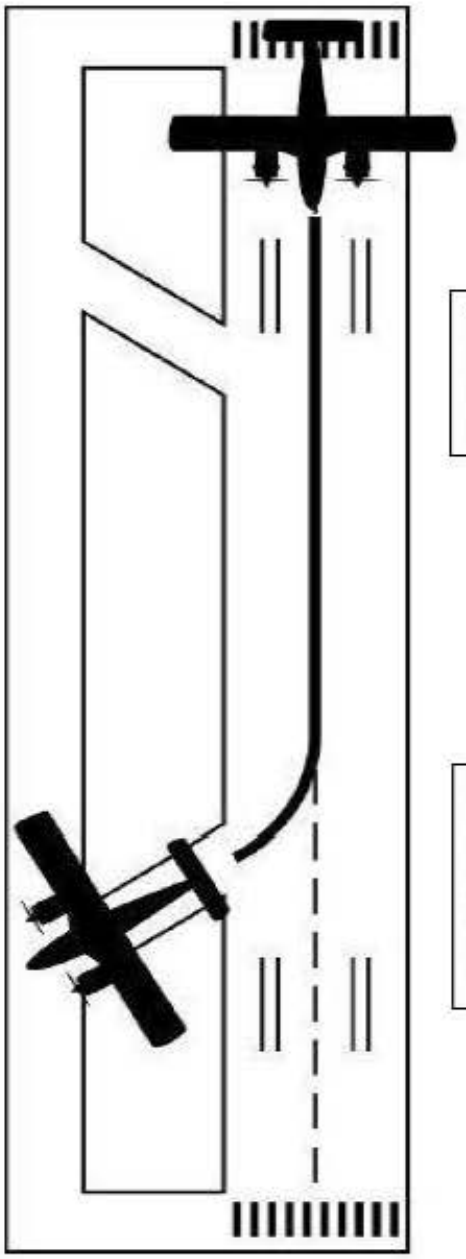
ROTATE – 85 KIAS (Add 10 KIAS for gusty conditions or heavy load.)
GEAR – UP After positive rate of climb
FLAPS – Retract after passing blue line
AIRSPEED – Accelerate through blue line to 120 KIAS while maintaining positive rate of climb.

CLIMBOUT

POWER – Climb power 2400 RPM / 37" MP
CHECKLIST – Complete appropriate checklist.
AIRSPEED – Cruise climb at 120-130 KIAS

REJECTED TAKEOFF

This maneuver provides training in positive aircraft control for stopping the aircraft if a malfunction or sudden runway intrusion occurs during the initial phase of takeoff. For simulated engine failure during takeoff, the instructor will simulate an engine failure" by reducing power on one engine during the initial takeoff phase with adequate runway remaining and 50% below Vmc of 72 KIAS.



ENGINE FAILURE:

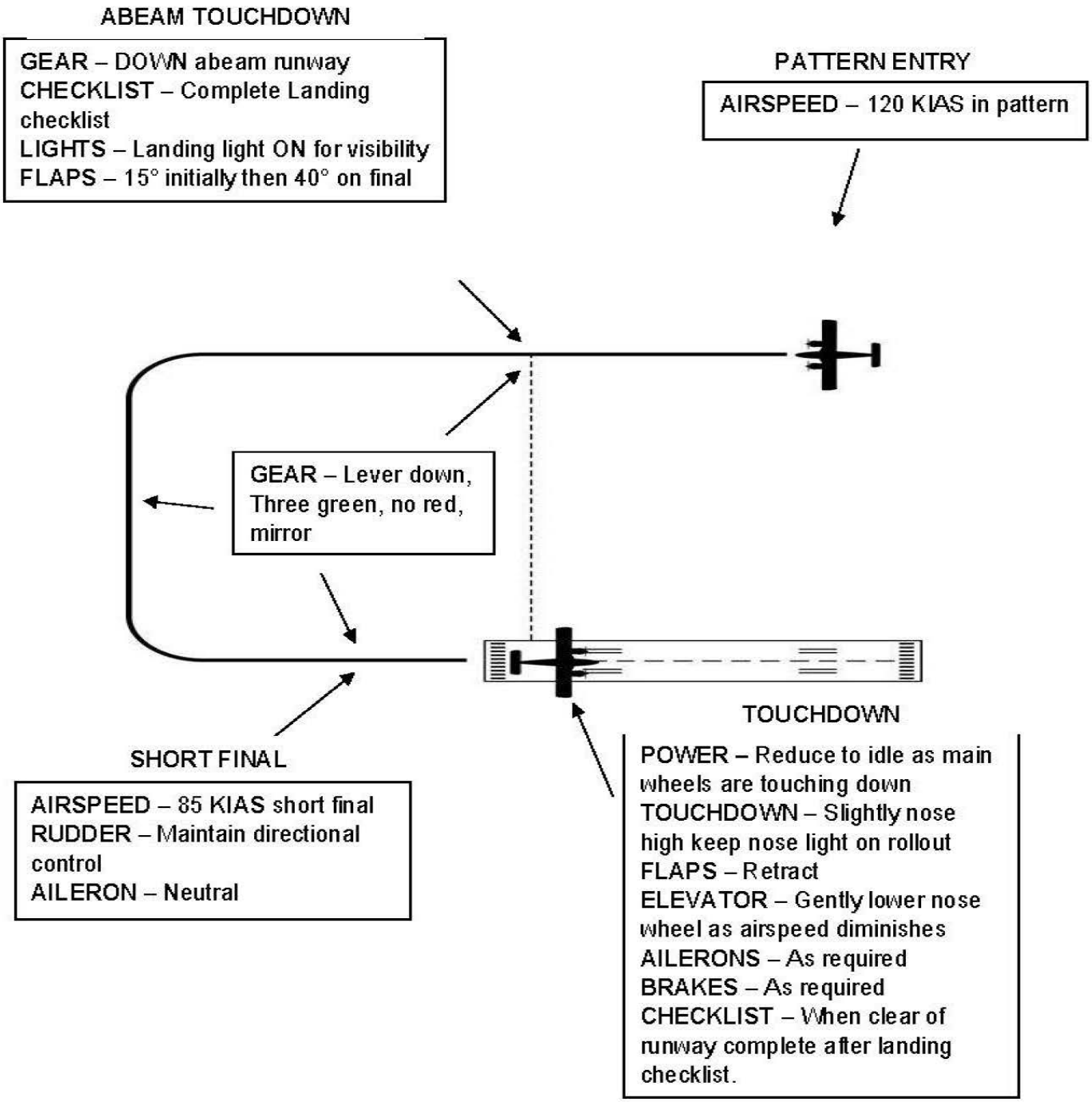
THROTTLES – Idle
BRAKING – Maximum braking consistent with safety and runway conditions

IF AIRCRAFT CANNOT BE STOPPED ON RUNWAY AND

MIXTURE CONTROLS – FUEL CUT-OFF
MAGNETOS – OFF
MASTER SWITCH – OFF
PASSENGERS – Assist with evacuation if necessary

NORMAL APPROACH & LANDING

The purpose of the normal landing is to execute a smooth touchdown and rollout on a hard surfaced runway with ample landing area. The procedure assumes a normal pattern approach with a head wind or no wind. Landing gear checks should not be limited to initial landing checks on downwind. Multiple gear checks are encouraged after entering the traffic pattern.



CROSSWIND LANDING

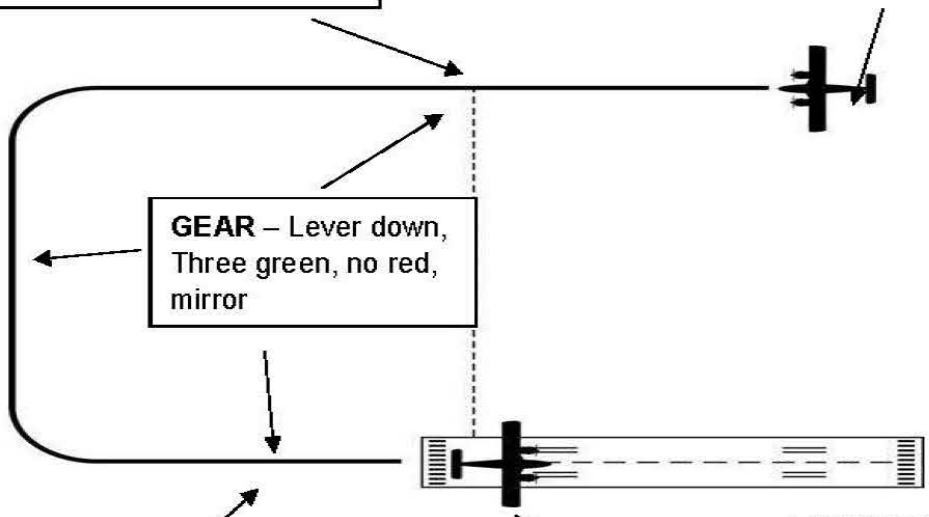
The purpose of the crosswind landing is to land the airplane with a coordinated and straight approach in relation to the runway centerline under crosswind conditions. Landing gear checks should not be limited to the initial landing checks on downwind. Multiple gear checks are encouraged after entering the traffic pattern.

ABEAM TOUCHDOWN

GEAR – DOWN abeam runway
CHECKLIST – Complete Landing checklist
LIGHTS – Landing light ON for visibility
FLAPS – AS required – Consider reduced flap setting in strong/gusty winds

PATTERN ENTRY

AIRSPEED – 120 KIAS in pattern



GEAR – Lever down, Three green, no red, mirror

SHORT FINAL

AIRSPEED – 85 **KIAS** and half the gust factor short final
RUDDER – Crab into wind
AILERON – Into wind and change to slip just prior to touchdown

TOUCHDOWN

POWER – Use power as required on upwind engine to aid in directional control
TOUCHDOWN – Upwind wheel should contact first with no side drift
FLAPS – Retract
ELEVATOR – Lower gently but quickly to maintain ground control.
AILERONS – Increase deflection into wind as speed diminishes.
BRAKES – As required
CHECKLIST – When clear of runway complete after landing checklist.

SHORT FIELD LANDING

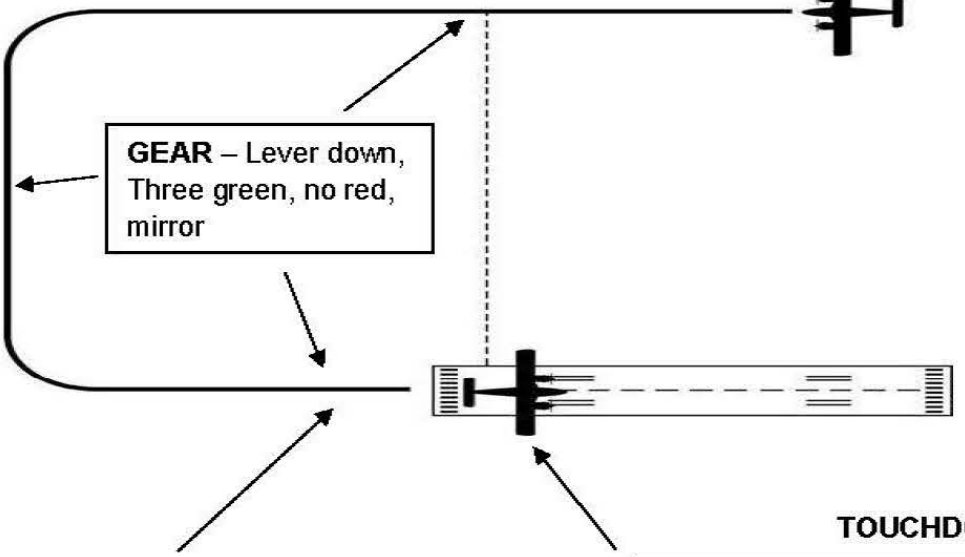
The purpose of the short field landing is to land at or near the threshold at a low speed. If the effective runway length is reduced due to obstacles in approach path, then consider the situation to be a short field landing also. There should be little or no floating during round out so airplane can be stopped in shortest distance possible.

ABEAM TOUCHDOWN

GEAR – DOWN abeam runway
CHECKLIST – Complete Landing checklist
LIGHTS – Landing light ON for visibility
FLAPS – 15° initially then 40° on final

PATTERN ENTRY

AIRSPEED – 120 KIAS in pattern



GEAR – Lever down, Three green, no red, mirror

SHORT FINAL

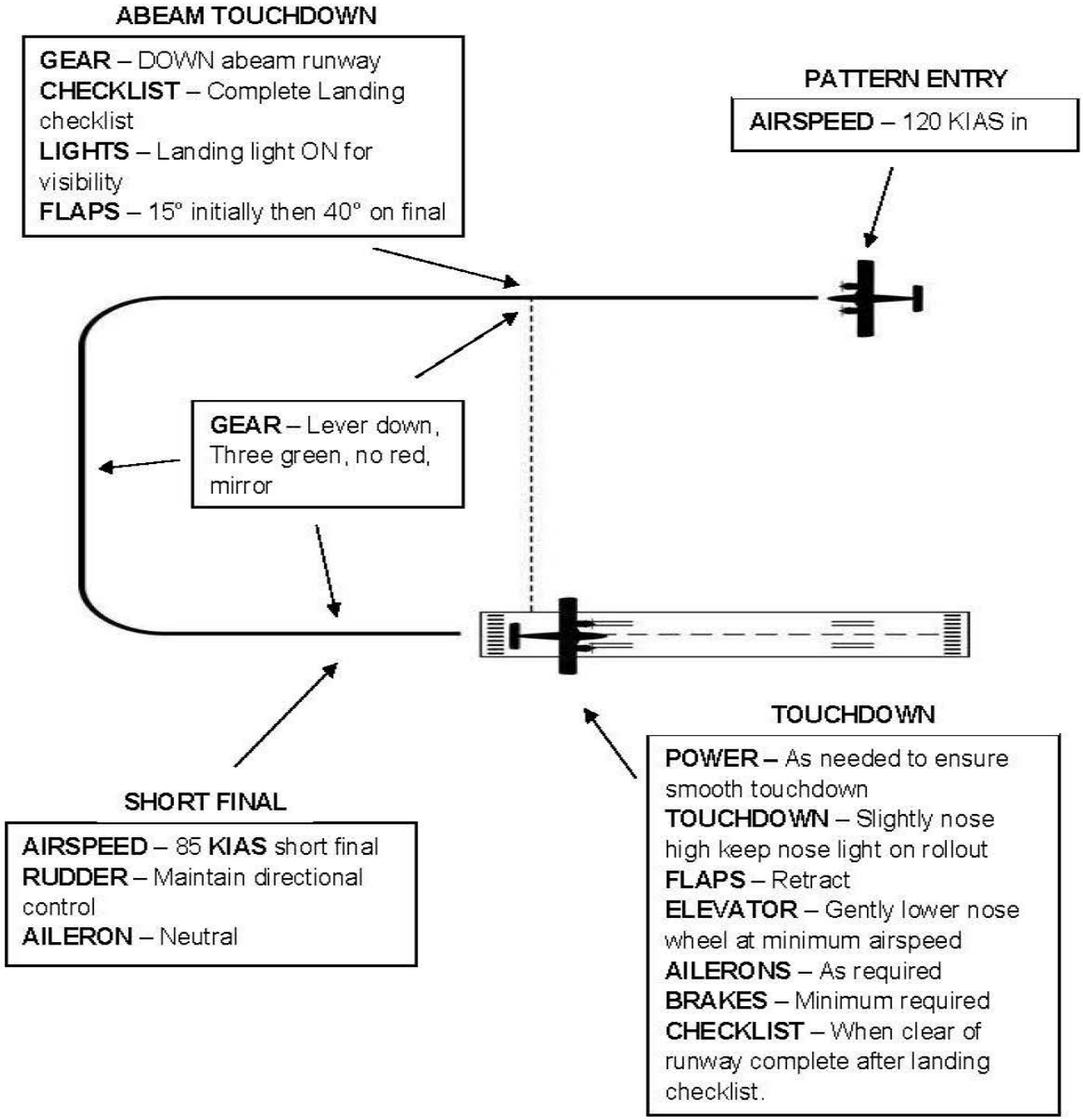
FLAPS – 40° full
AIRSPEED – 85 **KIAS** short final
RUDDER – Maintain directional control
AILERON – Neutral

TOUCHDOWN

POWER – Reduce to idle as main wheels are touching down
TOUCHDOWN – Slightly nose high keep nose light on rollout
FLAPS – Retract as main wheels contact (This will give maximum braking effectiveness)
ELEVATOR – Gently lower nose wheel as airspeed diminishes
AILERONS – As required
BRAKES – Maximum braking effort after touchdown.
CHECKLIST – When clear of runway complete after landing checklist.

ROUGH FIELD LANDING

The purpose of this type of landing is to land the airplane softly and maintain a smooth and consistent rollout to avoid damage to the prop and landing gear. Slightly higher power is used throughout the final approach to reduce the rate of descent and allow the airplane to gradually contact the runway surface. A field is considered soft if it is sandy, muddy, slushy or has snow on it.



REJECTED LANDING

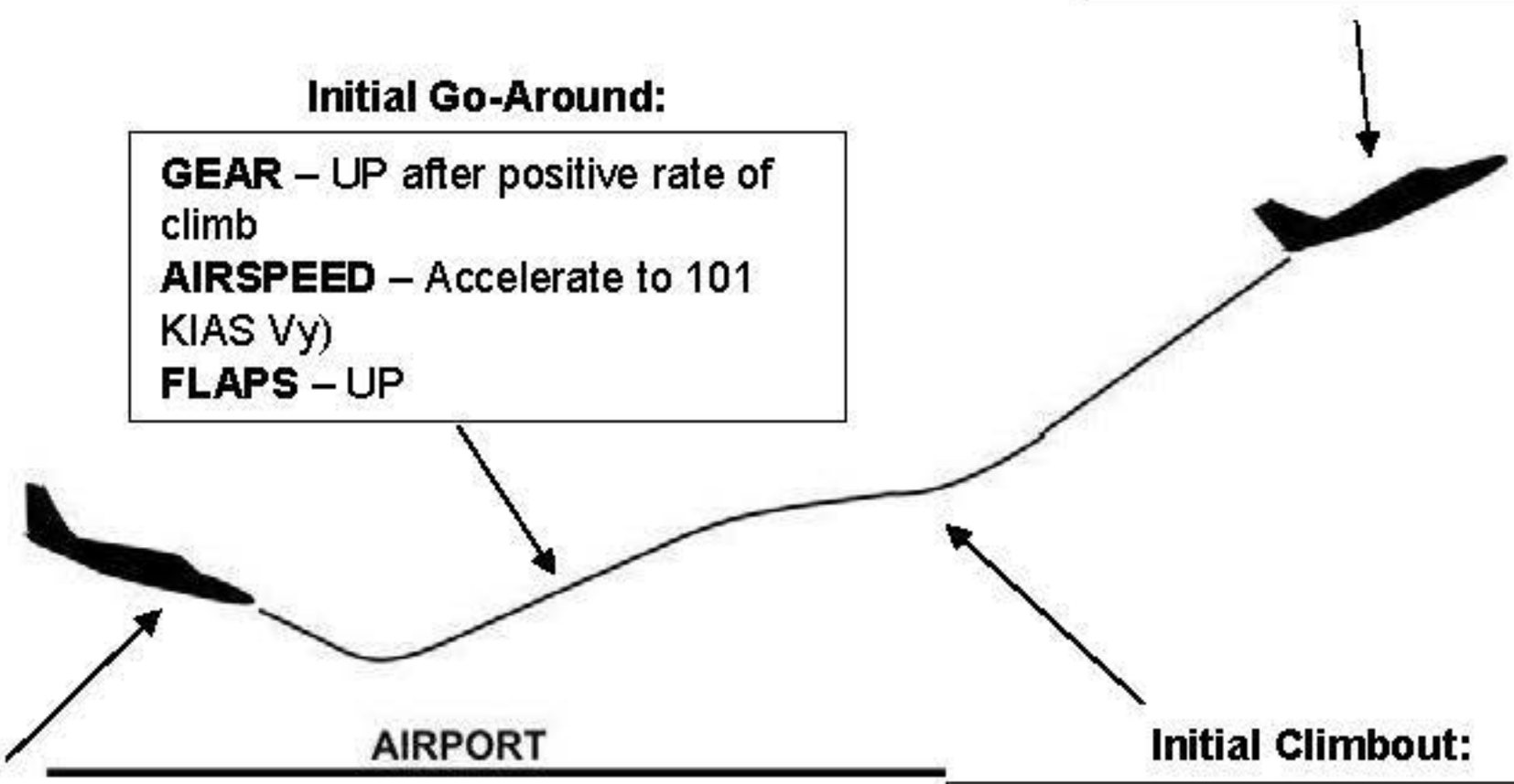
The purpose of this maneuver is to execute a go-around procedure as required by an emergency after a normal pattern approach, or when any unsafe landing conditions develop during the approach. The landing gear and flaps will be down and the "Before Landing" checklist completed. At any time on final approach prior to 50' AGL, the instructor will announce "Go Around".

Climbout:

AIRSPEED – Cruise climb at 120-130 KIAS

Initial Go-Around:

GEAR – UP after positive rate of climb
AIRSPEED – Accelerate to 101 KIAS Vy)
FLAPS – UP



Initial Climbout:

POWER – 38" **MP**/2400 RPM above 100' AGL
CHECKLIST – Complete Climb checklist

Go-Around becomes necessary:

POWER – Set maximum allowable
PITCH – 5°-7° nose up
FLAPS – 15°

STEEP TURNS

The purpose of this maneuver is to control the airplane in steep bank angles with a minimum loss or gain of altitude

Set-up

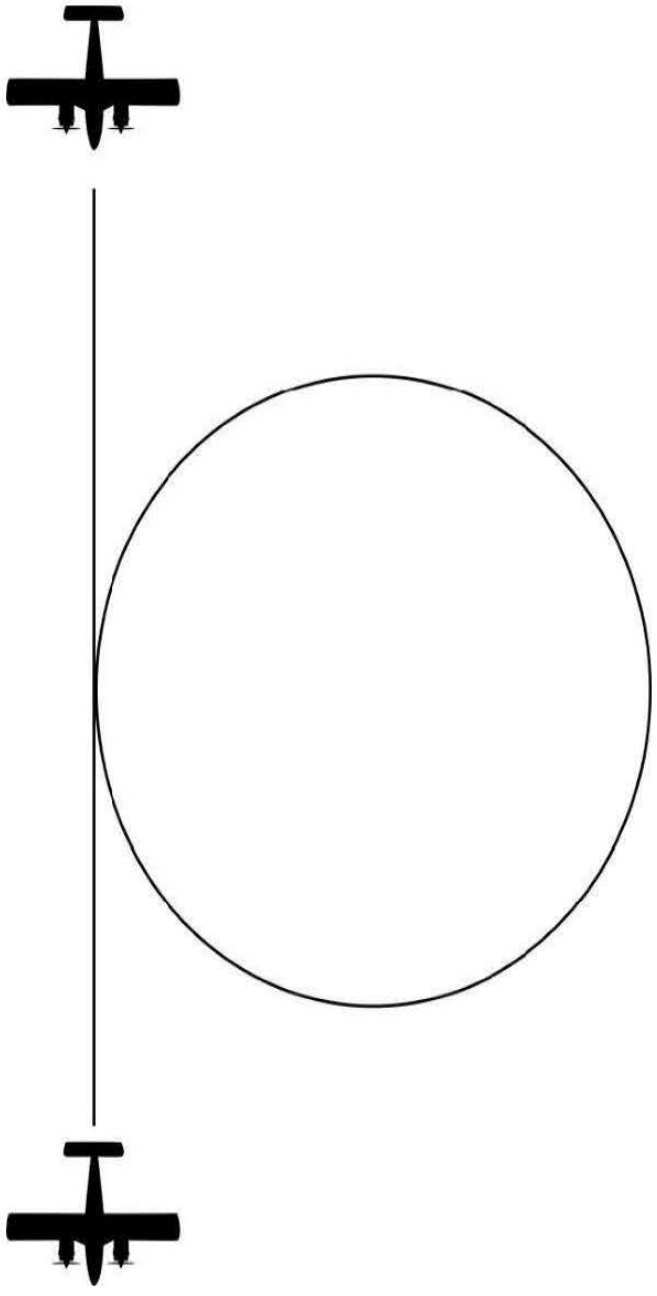
1. Heading-Select Cardinal Heading
2. Power-As required
3. Airspeed-130 KIAS

Turn

1. Entry – Smoothly roll into a 50° bank turn
2. Power – Rolling through 30° add 2-3" MP to maintain airspeed & altitude
3. Monitor – ADINSI/Altimeter

Rollout

1. Controls – Lead rollout heading approximately 15°
2. Power – Reduce power 2-3"MP when rolling out of maneuver
3. Pitch – Trim out back pressure and rollout on initial heading while maintaining altitude and airspeed
4. Controls – Roll into a 360° turn in opposite direction and repeat maneuver



TAKEOFF CONFIGURATION STALL

Flight training in stalls and stall recovery is required by 14 CFR. The objectives in performing intentional stalls are to familiarize the pilot with the conditions that produce stalls, to assist in recognizing an approaching stall, and to develop the habit of taking prompt preventive or corrective action. The purpose of the various configurations; namely the power-on stall, power-off stall, and accelerated stall emphasizes that the direct cause of every stall is an excessive angle of attack. The pilot should fully understand that there are any number of flight maneuvers which may produce an increase in the wing's angle of attack, but the stall does not occur until the angle of attack becomes excessive, i.e., the critical angle of attack is reached.

Set-up

1. Power – As required to establish Vy (101 KIAS) in level flight
2. Flaps – 15°
3. Gear – Down
4. Power – Full power (see note 1)
5. Pitch – Establish 15° to 30° bank and gradually increase pitch until first indication of stall (Horn, buffet, loss of directional control)

Recovery at stall indication

1. Pitch - Reduce to eliminate stall indication & level wings
2. Power – Set maximum allowable
3. Gear – Up after positive rate of climb
4. Airspeed – Increase to Vy (101 KIAS)

Note 1: Due to excessive pitch angles at reduced aircraft weights the instructor may have the pilot use a reduced power setting. - But not less than 65%.

Note 2: FAA ACS- All stalls will be recovered no lower than 3000 feet AGL for multiengine airplanes, unless the manufacturer recommends a higher altitude to initiate the recovery.

Note 3: Low speed is not necessary to produce a stall. The wing can be brought to an excessive angle of attack at any speed.

LANDING CONFIGURATION STALL

Flight training in stalls and stall recovery is required by 14 CFR. The objectives in performing intentional stalls are to familiarize the pilot with the conditions that produce stalls, to assist in recognizing an approaching stall, and to develop the habit of taking prompt preventive or corrective action. The purpose of the various configurations; namely the power-on stall, power-off stall, and accelerated stall emphasizes that the direct cause of every stall is an excessive angle of attack. The pilot should fully understand that there are any number of flight maneuvers which may produce an increase in the wing's angle of attack, but the stall does not occur until the angle of attack becomes excessive, i.e., the critical angle of attack is reached.

Set-up

6. Power – As required to establish Vy (101 KIAS) in level flight
7. Gear – Down
8. Flaps – 40°
9. Power – Reduce to establish 3° stabilized descent
10. Pitch – Increase gradually until first indication of stall (Horn, buffet, loss of directional control)

1st INDICATION OF STALL

Recovery at stall indication

5. Pitch - Reduce to eliminate stall indication & level wings
6. Power – Set maximum allowable
7. Gear – UP after positive rate of climb
8. Airspeed – Increase to Vy (101 KIAS)
9. Flaps – UP

Note 1: FAA ACS - All stalls will be recovered no lower than 3000 feet AGL for multiengine airplanes, unless the manufacturer recommends a higher altitude to initiate the recovery.

Note 2: Low speed is not necessary to produce a stall. The wing can be brought to an excessive angle of attack at any speed.

CLEAN CONFIGURATION STALL (AUTOPILOT ON)

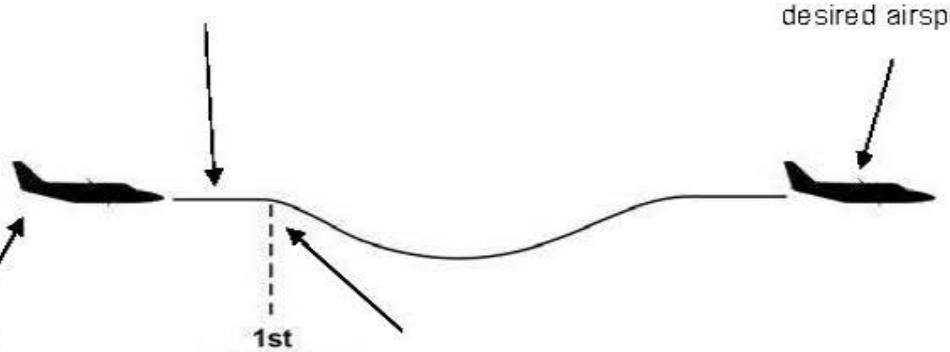
Flight training in stalls and stall recovery is required by 14 CFR. The objectives in performing intentional stalls are to familiarize the pilot with the conditions that produce stalls, to assist in recognizing an approaching stall, and to develop the habit of taking prompt preventive or corrective action. The purpose of the various configurations; namely the power-on stall, power off stall, and accelerated stall emphasizes that the direct cause of every stall is an excessive angle of attack. The pilot should fully understand that there are any number of flight maneuvers which may produce an increase in the wing's angle of attack, but the stall does not occur until the angle of attack becomes excessive, i.e., the critical angle of attack is reached.

Autopilot stall induce

1. Power – Gradually decrease
2. Pitch – Allow autopilot to gradually increase pitch
3. Speed – Reduced to simulate leveling off

Recovery

1. Recover to initial altitude
2. Power – Reduce to maintain desired airspeed



Set-up

1. Power – As required to establish cruise in level flight
2. Autopilot – ON

1st INDICATION OF STALL

At first indication (See note 3)

1. Autopilot – OFF with red Autopilot Disengage button
2. Pitch – Reduce to eliminate stall indication
3. Max power – Set

Note 1: FAA ACS- All stalls will be recovered no lower than 3000 feet AGL for multiengine airplanes, unless the manufacturer recommends a higher altitude to initiate the recovery.

Note 2: Low speed is not necessary to produce a stall. The wing can be brought to an excessive angle of attack at any speed.

Note 3: Aircraft will not stall with autopilot engaged but will descend at speed above stall when autopilot pitch servo reaches travel limit. Disengage autopilot and initiate recovery at first indication of altitude loss.

VMC DEMONSTRATION

The Vmc demonstration is an exercise to show the single engine slow speed handling characteristics and to familiarize or refresh the pilot with characteristics, onset and recovery from a Vmc Roll. To be performed at or above 5000' agl.

VMC CERTIFICATION FACTORS

1. Maximum Thrust on Operating Engine, 2. Most Critical Engine Windmilling, 3. Max Gross Weight, 4. CG at Aft Limit, 5. Flap at Takeoff Setting (Normal Takeoff),	6. Landing Gear Up 7. Cowl Flaps Open, 8. Standard Sea Level Conditions, 9. Maximum 5° Bank Toward Operating Engine, 10. Aircraft Out Of Ground Effect

To perform a Vmc demonstration the aircraft is slowed to Vsse and trimmed for level flight. Either Left or Right engine can be reduced to idle, and the aircraft slowed toward Vmc. During training, the CG is typically going to be near the forward range and the aircraft below max gross weight. This means Vmc will typically be lower than the certification speed.

Slow aircraft to Vsse (92 KIAS)

- Trim aircraft for level flight with both engines running,
- Do not adjust trim as aircraft slows toward Vmc,
- Reduce power on either left or right engine to idle ①,
- As aircraft slows, increase power on operating engine toward max takeoff power ②.

Velocity of Minimum Control

- Recovery should begin when any of the following are encountered:
    - o Any sign of stall,
    - o Uncontrollable roll,
    - o Uncontrollable bank.

Recovery

- Operating Engine – REDUCE POWER and simultaneously,
- Angle of Attack – REDUCE AOA and allow aircraft to accelerate,
- Operating Engine – Increase power and regain control.
- Airspeed – Accelerate to Vsse.

Maneuver Complete

NOTE: ① The landing gear warning horn will sound continuously once throttle is reduced to idle.

NOTE: ② When increasing power on the operating engine, the power addition should be smooth and at a normal rate. Jamming the throttle forward quickly will result in a snappy and uncontrollable Vmc Roll.

SYSTEMS AND EQUIPMENT MALFUNCTIONS AND FAILURES

At the instructor's option and without advance warning, the instructor will simulate and/or announce various system and equipment malfunctions, failures, and conditions. The student shall explain or demonstrate (as directed by the instructor) the appropriate procedures to address the simulated or announced conditions. These may include (and may not be limited to):

- Partial or complete power loss
- Engine roughness or overheat
- Induction icing & structural icing
- Loss of oil pressure
- Fuel starvation
- Electrical malfunction
- Vacuum / pressure, and associated flight instruments malfunction
- Pitot / static
- Landing gear or flap malfunction
- Inoperative trim
- Inadvertent door or window opening
- Structural icing
- Smoke / fire / engine compartment fire

UNUSUAL ATTITUDES/ PARTIAL PANEL

The instructor will simulate partial panel and put the airplane in the following attitudes prior to recovery back to normal cruise flight

Nose Low -Airspeed Increasing

Power	Reduce as required
Wings	Roll level
Pitch	Slowly increase to stabilized attitude
Power	Increase as required

Nose High - Airspeed Decreasing

Power	Increase as required
Pitch	Reduce to stabilized attitude
Wings	Roll level
Power	Decrease as required

ENGINE FAILURE AFTER LIFTOFF

This maneuver will be reviewed before departure and will be initiated by instructor saying 'simulated engine failure' and reducing the power of the most critical engine. The failure will be initiated above 500' AGL and a minimum airspeed of 92 KIAS (VssE}.

ENGINE FAILURE DETECTED	CLIMB	SAFE ALTITUDE
1. Fly aircraft - establish 7° nose up pitch attitude and 3° to 5° bank into inop engine 2. Confirm max power is set 3. Bring gear Up after positive rate of climb established	1. Confirm flaps UP 2. Identify, confirm and feather inop engine 3. Initiate climb at 107 KIAS (VYSE) Blue line	1. Complete Engine Failure During Takeoff Checklist 2. Land as soon as practical

IF THROTTLE IS UNRESPONSIVE (DEAD ENGINE)
- Throttle (Inop engine) - IDLE
- Propeller (Inop engine) – FEATHER
- Mixture (Inop engine) – CUT-OFF
- Cowl Flap (Inop engine) – CLOSE

IF THROTTLE IS RESPONSIVE (ENGINE RUNNING ROUGH)
- Mixture (Rough Engine) – LEAN UNTIL RUNNING SMOOTH

See NOTE below regarding turbo failures

NOTE: A turbocharger failure on takeoff is indicated by a rough running engine due to excessive fuel flow for the amount of air the engine is able to ingest. A responsive throttle and a low EGT indication verify a turbo charger failure. In the case of a turbo charger failure the mixture is leaned on the affected engine until the engine runs smooth. In this case the engine would still deliver 75% power or 262 HP at sea level in standard conditions.

MANEUVERING WITH ONE ENGINE INOPERATIVE

The instructor will simulate an engine failure during flight and the pilot will demonstrate appropriate emergency procedures. At cruise airspeed the instructor will reduce power to simulate an engine failure. The pilot will maintain the assigned heading and altitude while accomplishing the memory items on the Engine Failure Checklist. After completion of the memory items the pilot will secure or simulate securing the engine (as directed by the instructor) by completing the checklist. After the engine failure checklist has been completed the airman will either restart the engine or simulate a restart with the use of the 'Airstart' checklist.

ONE ENGINE INOPERATIVE APPROACH & LANDING

Follow speeds and procedures for normal instrument approaches with the following exceptions:

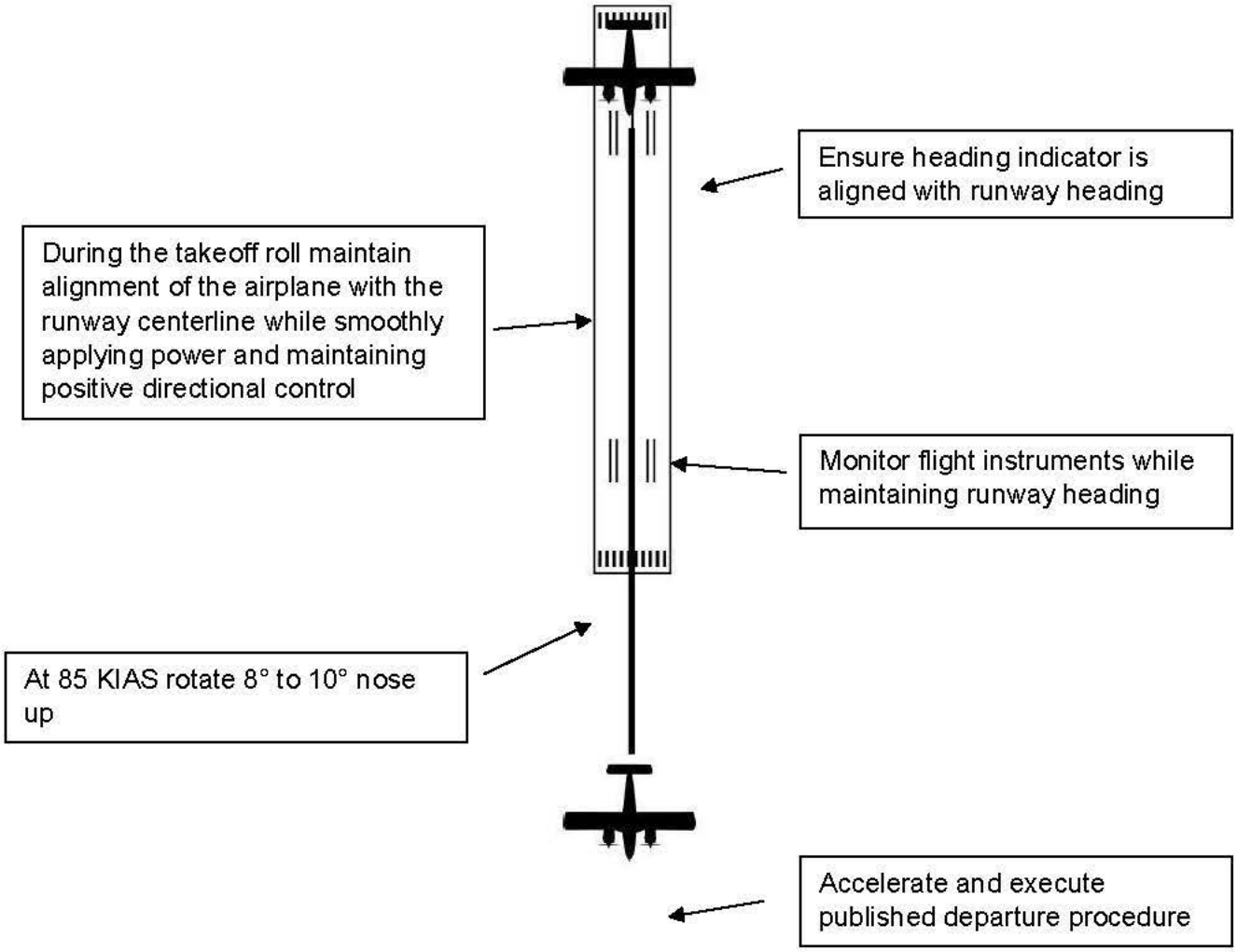
- On straight-in approaches do not lower flaps until landing assured.
- On circling approaches do not lower landing gear or flaps until in position to make normal landing.
- Maintain airspeed above Vyse 107 KIAS until landing assured.
- Minimum flap necessary to achieve a safe landing with the landing space available is recommended. A single engine go-around should be avoided if at all possible. A go-around from a full flap position is not possible unless sufficient altitude is available to raise flaps in a decent.

Missed Approach Procedure

- If missed approach becomes necessary initiate as soon as possible.
- Maintain Vyse 107 KIAS throughout missed approach
- Set maximum power
- Raise landing gear and check flaps up
- Establish positive rate of climb at Vyse 107 KIAS
- Execute published MAP

STANDARD INSTRUMENT TAKEOFF

The instructor will simulate instrument conditions at or above 100' AGL with a view limiting device. Follow procedures for normal takeoff with the addition of the following:

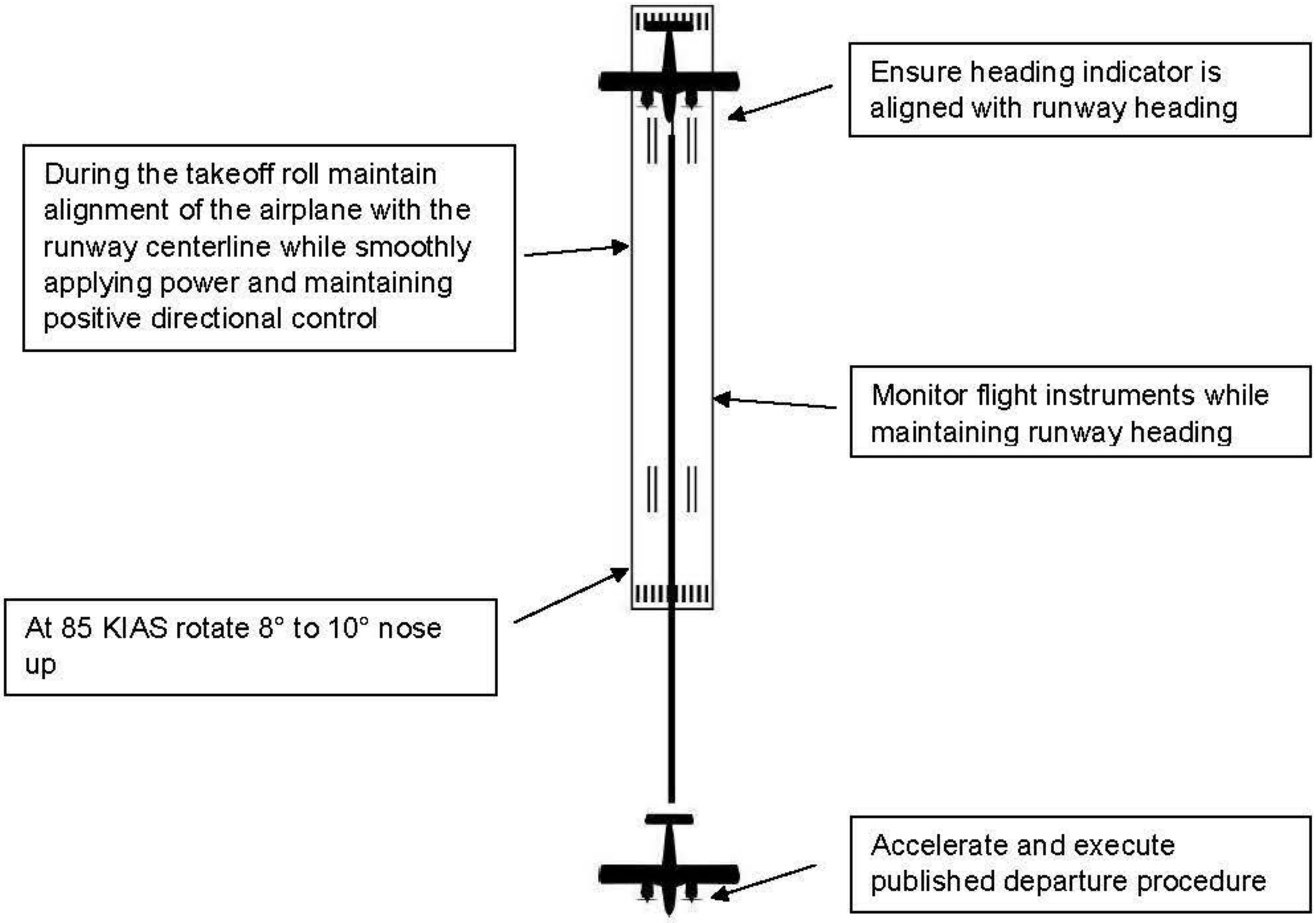


USE NORMAL TAKEOFF PROCEDURES

LOWER THAN STANDARD INSTRUMENT TAKEOFF - Ops Spec C057

In addition to completing Standard Instrument Takeoff training, crewmembers being trained to conduct Lower Than Standard Takeoffs in accordance with ops spec C057 must be able to demonstrate satisfactory knowledge and/or proficiency in the following areas:

- Taxiing in a low visibility environment with emphasis on preventing runway incursion
- Required ground based visual aids (such as stop bars, taxi holding position lights)
- Determination of takeoff alternate airports, as applicable.



Follow procedure for Standard Instrument Takeoff as depicted above with the following addition:

• The crewmember will perform the takeoff while wearing a view limiting device adjusted to allow viewing only the runway immediately in front of the aircraft.

• The instructor will monitor the takeoff and take control, if necessary, by calling 'My Aircraft'. The crewmember will respond by saying 'Your Aircraft' and relinquish control to the instructor.

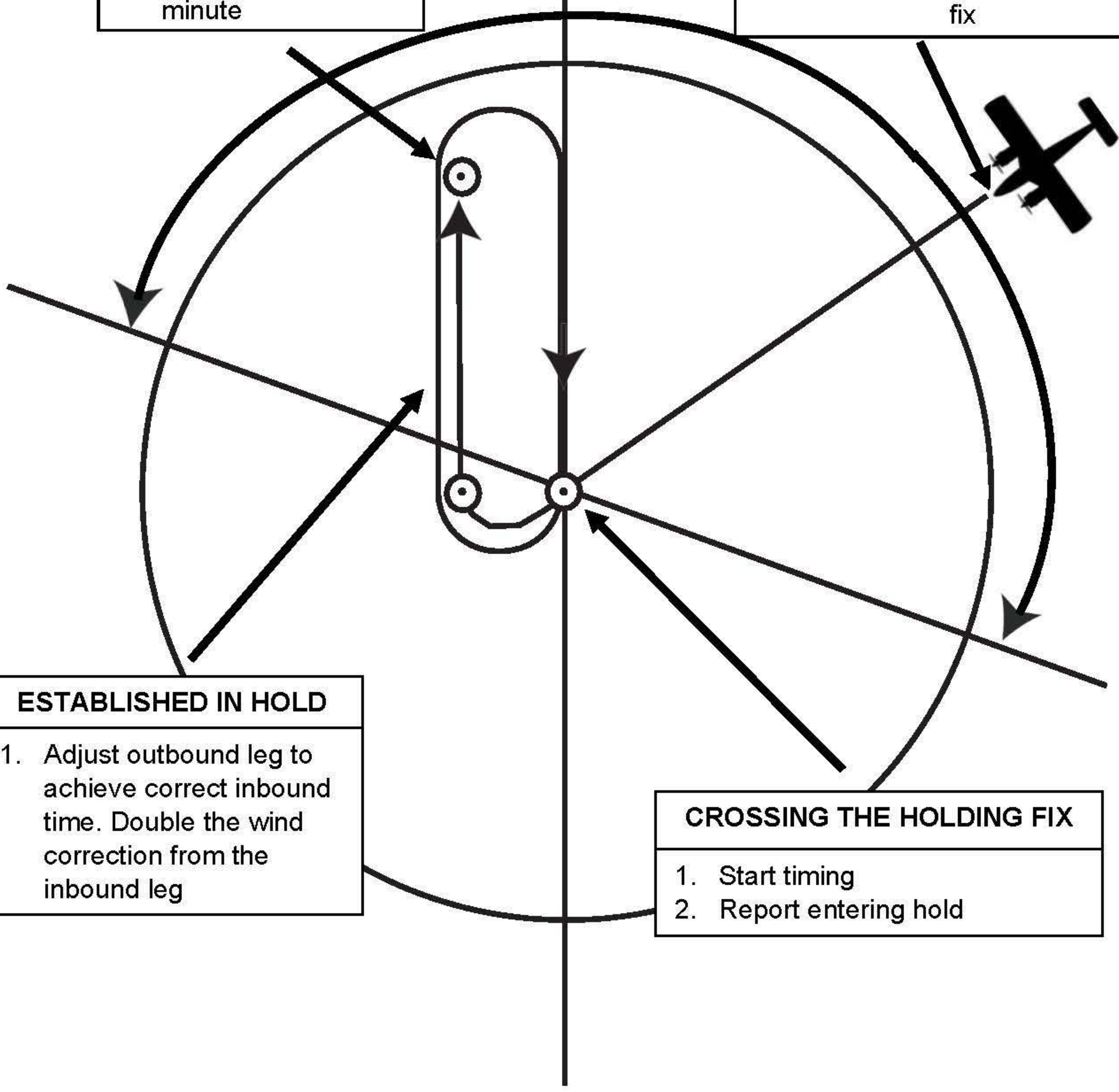
HOLDING PATTERNS – DIRECT ENTRY

TURN INBOUND

1. Adjust inbound leg length to provide 1 minute

INITIAL

Slow to the holding airspeed of 140 KIAS within 3 min of holding fix



ESTABLISHED IN HOLD

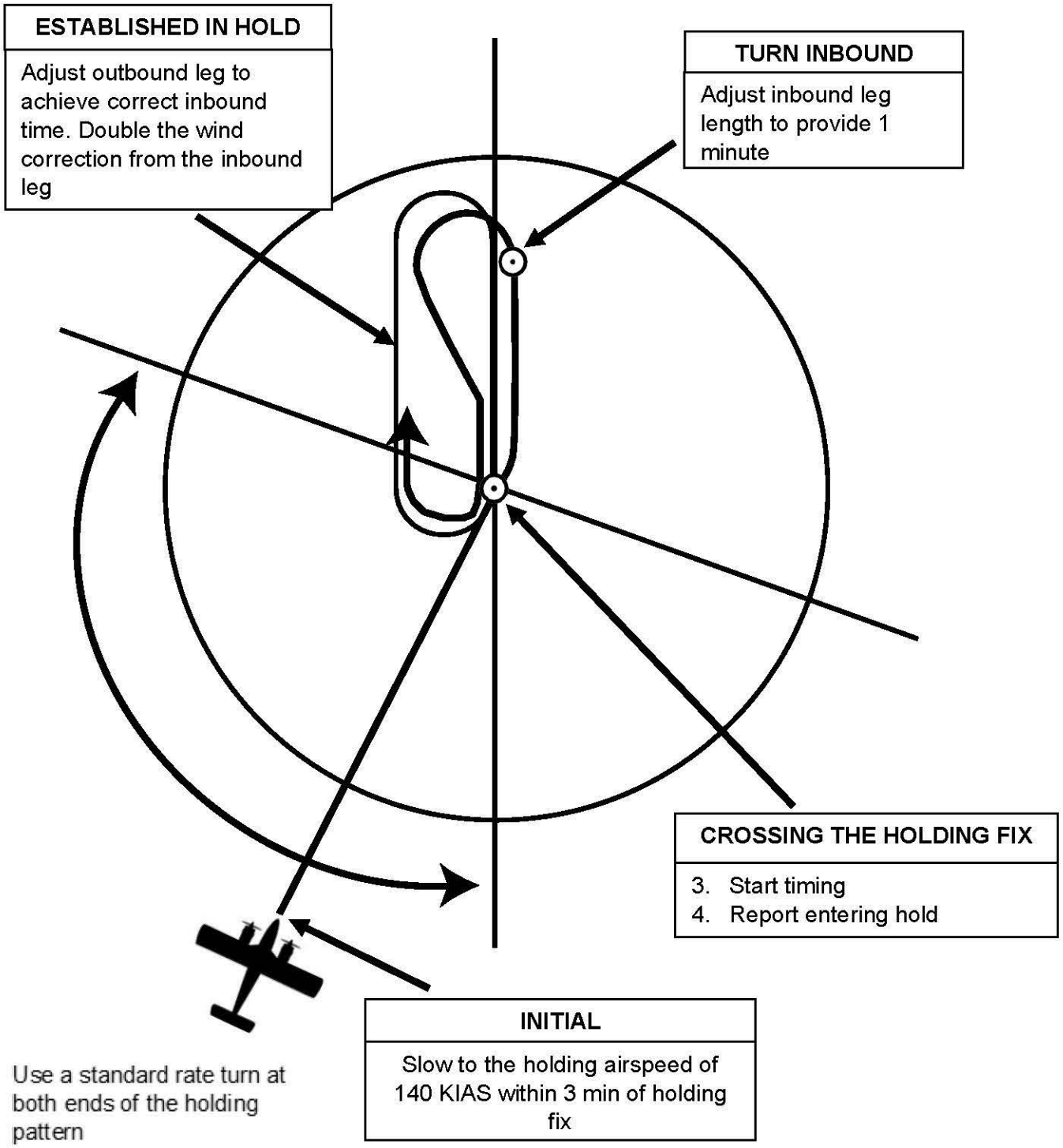
1. Adjust outbound leg to achieve correct inbound time. Double the wind correction from the inbound leg

CROSSING THE HOLDING FIX

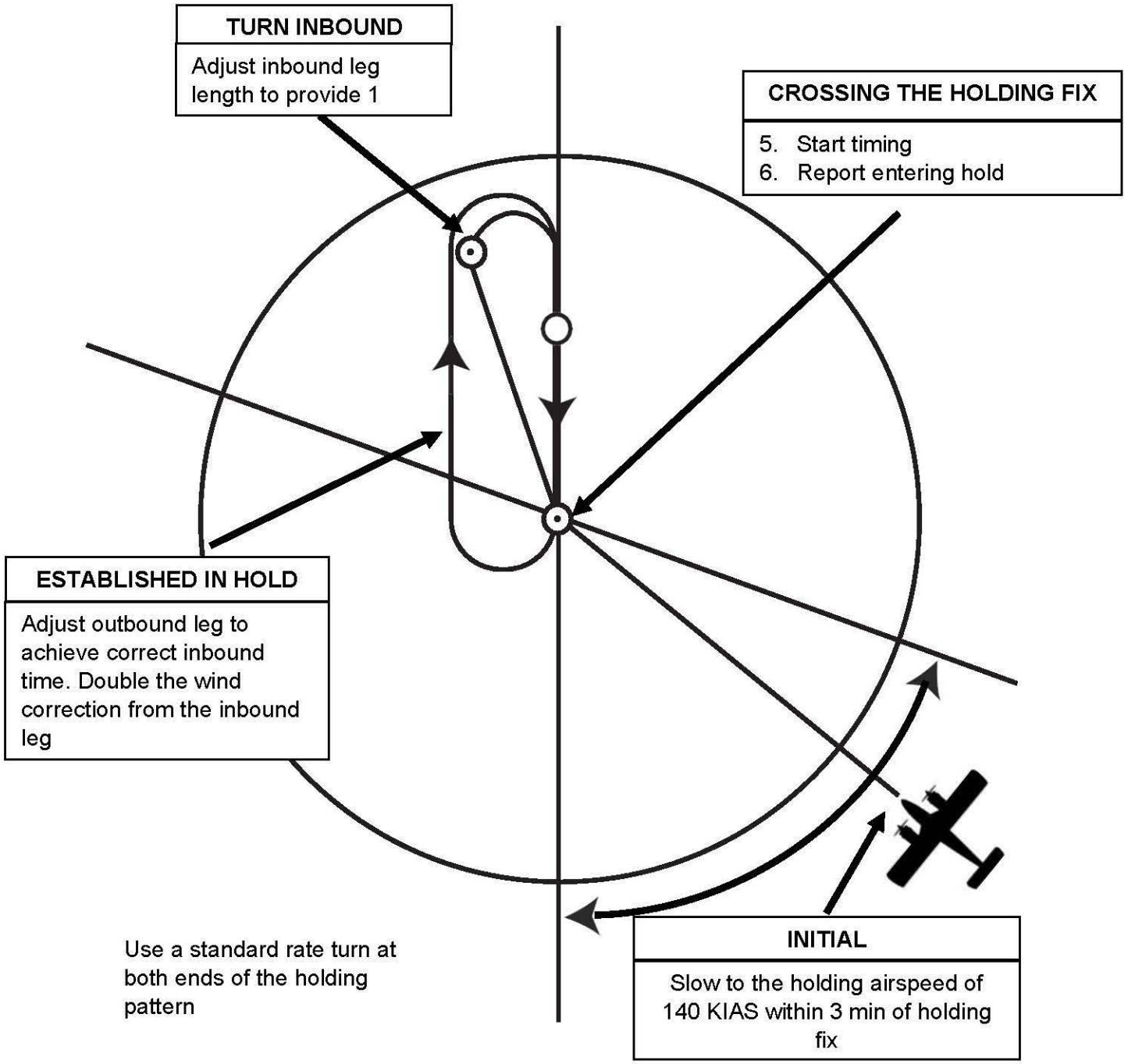
1. Start timing
2. Report entering hold

Use a standard rate turn at both ends of the holding pattern

HOLDING PATTERNS – PARALLEL ENTRY



HOLDING PATTERNS – TEARDROP ENTRY



NON-PRECISION APPROACH, LANDING & MISSED APPROACH

A – PRIOR TO INITIAL APPROACH FIX

- Obtain ATIS & set altimeter
- Review approach & missed approach
- Tuned & identify NAVAIDS
- Slow to initial approach speed (130 KIAS or as desired)

B – IAF OUTBOUND

- Start timing
- Airspeed 130 KIAS
- Remain within charted distance from FAF

C – PRIOR TO FAF

- Complete landing checklist down to landing gear
- Set Flaps 15° and slow to final approach speed 120 KIAS (typical)

D – AT THE FAF

- Gear DOWN & locked
- Start time & report FAF inbound (if not in radar contact)
- Reduce power as necessary to descend 800 to 1000 fpm
- Airspeed 120 KIAS
- Complete landing checklist

E – AT MDA

- Power as necessary to maintain 120 KIAS

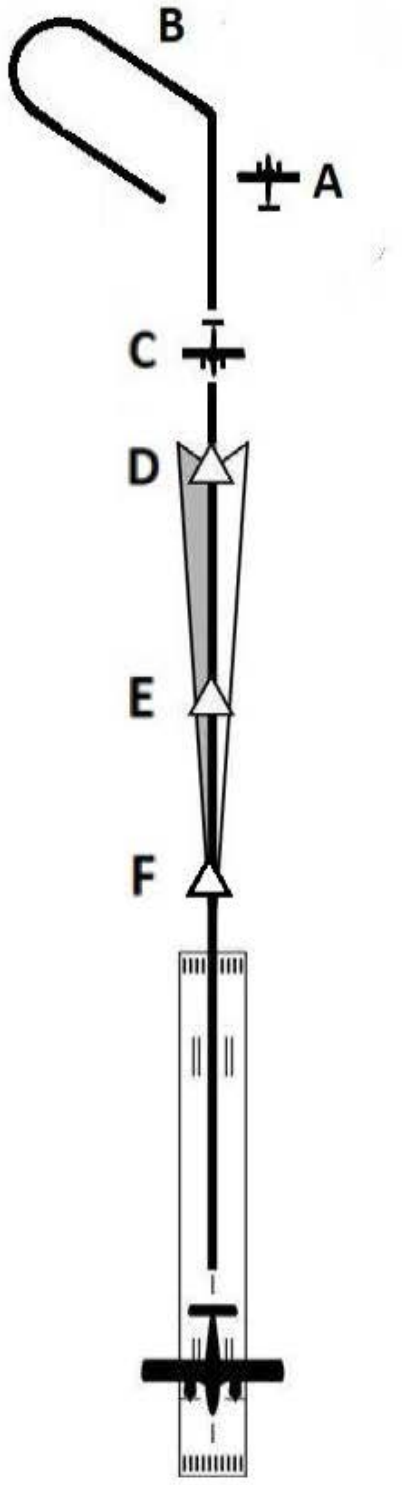
F – MISSED APPROACH POINT & RUNWAY IN SIGHT

- Flaps Landing - 25° or 40°
- Prop controls to 2400 RPM
- Airspeed 90 KIAS + 10 knots for gusty conditions
- Execute normal landing followed by after landing procedures

OR

F – MISSED APPROACH POINT & RUNWAY NOT IN SIGHT

- Set maximum power - 43" MP/2575 RPM
- Pitch to 8° to 10° nose up
- After positive rate of climb Gear UP
- Above 95 KIAS Flaps UP
- Climb at 101 KIAS - Vy
- Above 500' AGL set climb power 38" MP & 2400 RPM
- Complete Climb checklist
- Cruise climb, 120 - 130 KIAS
- Fly published missed approach procedure & advise ATC



ILS APPROACH, LANDING & MISSED APPROACH

A – PRIOR TO IAF or BEING VECTORED

- Obtain ATIS & set altimeter
- Review approach & missed approach
- Tuned & identify NAVAIDS
- Slow to initial approach speed (130 KIAS or as desired)

B – IAF OUTBOUND/VECTORS

- Start timing – if applicable
- Airspeed 130 KIAS
- Remain within charted distance

C – PRIOR TO GLIDE SLOPE INTERCEPT

- Complete landing checklist down to landing gear
- Set Flaps 15°
- Slow to final approach speed – 120 KIAS (typical)

D – 1 DOT BELOW GLIDE SLOPE INTERCEPT

- Gear DOWN & locked
- Start time & report FAF inbound (if not in radar contact)
- Reduce power as necessary to maintain 120 KIAS
- Report OM inbound (if not in radar contact)
- Complete landing checklist

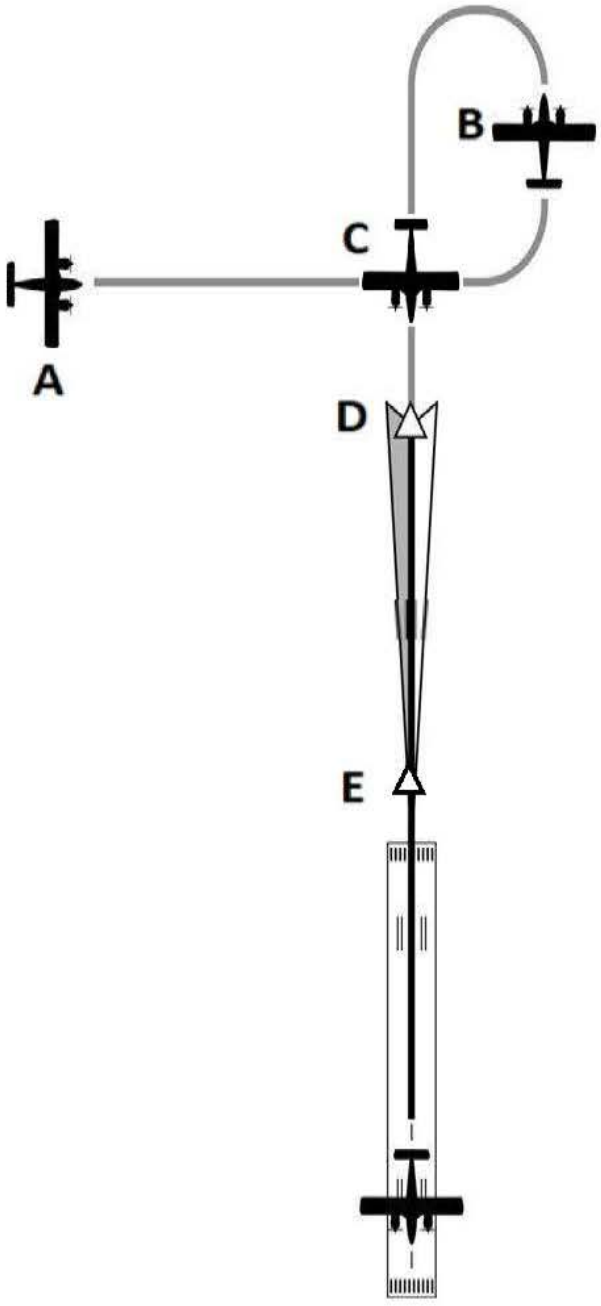
E – DH & RUNWAY IN SIGHT

- Flaps Landing - 25° or 40° confirm landing checklist complete
- Prop controls to 2400 RPM
- Airspeed 90 KIAS + 10 knots for gusty conditions
- Execute normal landing followed by after landing procedures

OR

E – DH & RUNWAY NOT IN SIGHT

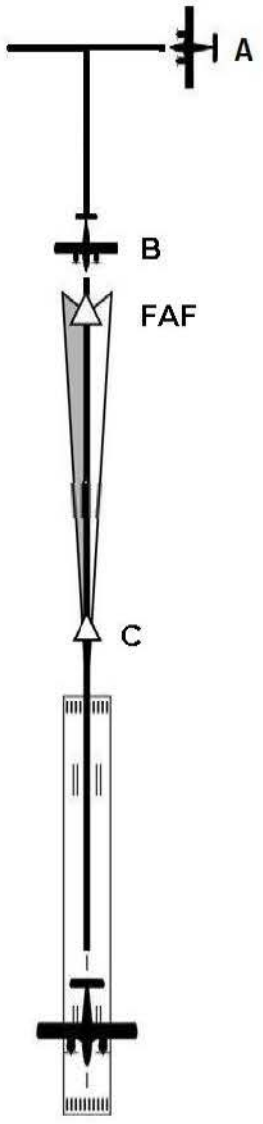
- Set maximum power - 43" MP/2575 RPM
- Pitch to 8° to 10° nose up
- After positive rate of climb Gear UP
- Above 95 KIAS Flaps UP
- Climb at 101 KIAS - Vy
- Above 500' AGL set climb power 38" MP & 2400 RPM
- Complete Climb checklist
- Cruise climb, 120 -130 KIAS
- Fly published missed approach procedure & advise ATC



GPS APPROACH, LANDING & MISSED APPROACH

General precautions when executing a GPS approach include: Be thoroughly familiar with the GPS unit being used. Be certain of the waypoint you are navigating to; some GPS approach waypoints are Initial Approach Fixes and the same waypoint may also be a Missed Approach Waypoint. Be familiar with the required GPS activation procedure for a missed approach when passing the Missed Approach Waypoint (MAWP). Fly the full approach from the Initial Approach Fix (IAF) unless specifically cleared and terrain clearance is assured. Joining an approach at an intermediate fix does not assure terrain clearance or proper GPS waypoint sequencing. Back up the GPS approach with alternative navigation equipment during the approach. Plan power settings and descent rates to arrive over Final Approach Waypoint (FAWP) at 120 KIAS. Use same procedure as non-precision or precision approach with the following differences:

A – OUTSIDE INITIAL APPROACH FIX
- Select and load GPS Approach
- Verify GPS waypoints on flight plan page match the approach plate waypoints
- Within 30 NM of airport or transitioning to first waypoint of arrival procedure ensure GPS has switched to 'Terminal' mode.
- Ensure CDI is in GPS mode
- Tune and Identify NAVAIDS as backup



B – PRIOR TO FINAL APPROACH FIX
- Within 2 **NM** of FAF verify GPS has switched to approach mode (LPV, L/NAV, LNAV+V, or LNAV)

C – MISSED APPROACH WAYPOINT & RUNWAY IN SIGHT
- Flaps 25° or 40° - Confirm Landing checklist complete
- Prop controls to 2400 RPM
- Airspeed 90 KIAS + 10 knots for gusty conditions
- Execute normal landing followed by after landing procedures

OR

C – MISSED APPROACH WAYPOINT & RUNWAY NOT IN SIGHT
- Deselect "Suspend" mode to enable missed approach waypoint sequencing
- Ensure CDI is in GPS mode
- Follow same missed approach procedure as Precision or Non-Precision Approach

CIRCLING APPOACH, LANDING & MISSED APPROACH

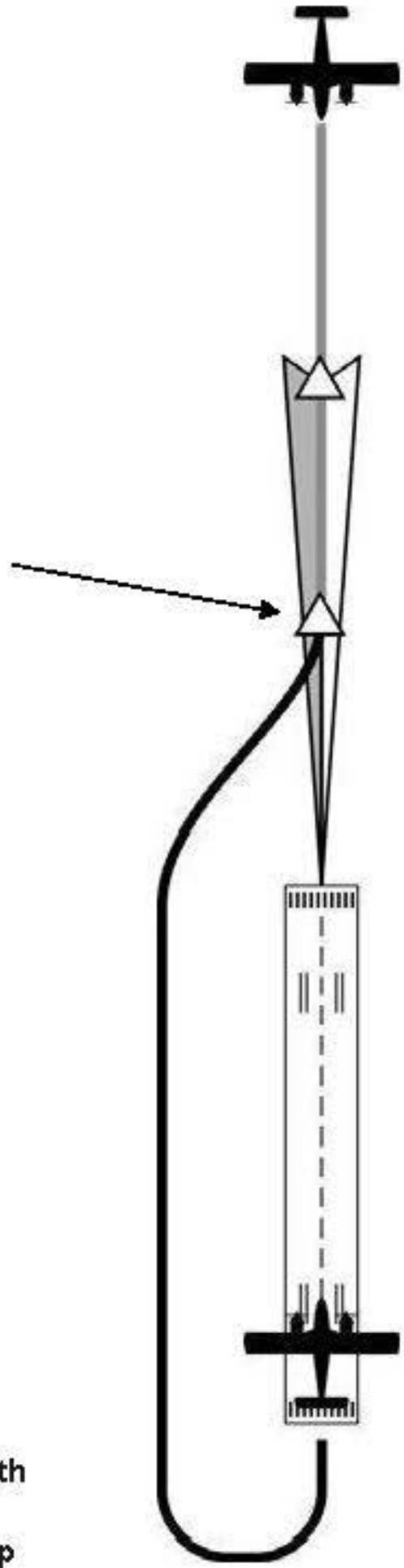
Use same procedures as non-precision or precision approach with the following exceptions:

AT MINIMUM DESCENT ALTITUDE

- Airspeed 120 KIAS (maximum for Category B minimums)
- Maneuver within Category B criteria area
- Maneuver the shortest path to the downwind or base leg considering weather conditions. There is no restriction from passing over the airport or other runways
- Maintain visual contact with runway environment
- Do not exceed 30° bank while maneuvering
- Maintain MDA until in position to make a normal landing
- Remain vigilant of VFR aircraft operating in the airport traffic area and follow airport traffic patterns whenever possible

CIRCLING MISSED APPROACH

- Initiate missed approach whenever visual contact with the runway environment is lost.
- Make initial climbing tum toward landing runway to join the published missed approach course and notify ATC



Note: If single-engine circling is required leave gear and flaps up until landing assured. Minimum flap necessary to achieve a safe landing with the landing space available is recommended. A single engine go-around should be avoided if at all possible. A go-around from a full flap position is not possible unless sufficient altitude is available to raise flaps in a decent.