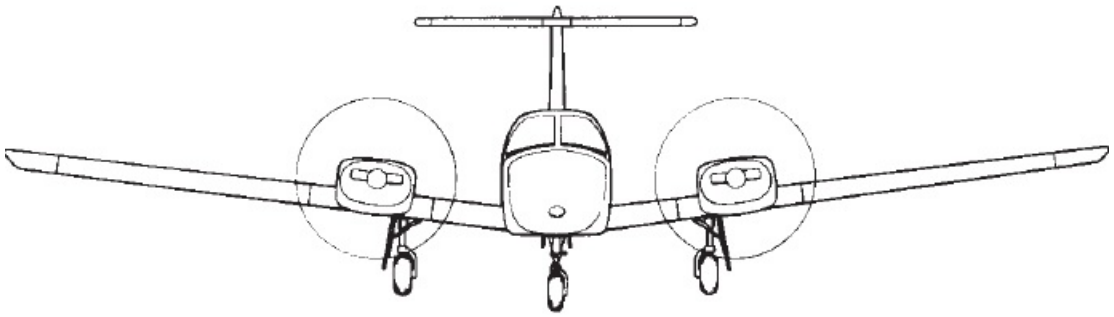
PA-44-180 SEMINOLE

COMMERCIAL COURSE

Standard Operating Procedures



University *of* Dubuque

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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, GEAR UP** (Ensure KIAS is less than 109)
1,000 Feet From Assigned Altitude	**1,000 FEET**
200 Feet From Assigned Altitude	**200 FEET**
Any Flap Change	**BELOW 111, FLAPS (##^{O}), TARGET (## knots)**
Landing Gear Retraction	**BELOW 109, GEAR UP** (Not required in conjunction with the "Pos Rate" call after TO)
Landing Gear Extension	**BELOW 140, GEAR DOWN**
Three Green Gear Indicator Lights	**THREE GREEN, NO RED, ONE IN THE MIRROR**
Turning Final	**FINAL CLEAR**

GUMPPS CHECKLIST

G—Gas..... Fuel selectors set to ON

U—Undercarriage.....Landing gear is down with 3 green lights visible

M—Mixtures.....Full rich

P—Props..... Full forward

P—Pumps .....Electric fuel pumps on

S—Switches .....Lights and electrical switches are on and set

V-SPEEDS PA44-180

References:

POH PA44-180

Speeds:

Rotation (Normal) ..... 75 KIAS
Rotation (Short Field MTOW) ..... 70 KIAS

V_{XSE} Best Angle of Climb (Single-engine) ..... 82 KIAS
V_X Best Angle of Climb ..... 82 KIAS
V_{YSE} Best Rate of Climb (Single-engine) ..... 88 KIAS
V_Y Best Rate of Climb ..... 88 KIAS
En-Route Climb ..... 105 KIAS

V_A Maneuvering Speed (3800) ..... 135 KIAS
V_A Maneuvering Speed (2870) ..... 115 KIAS
Practice Maneuvering Speed ..... 120 KIAS

V_{NE} Never Exceed ..... 202 KIAS
V_{NO} Maximum Structural Cruising ..... 169 KIAS
V_{LE} Maximum Landing Gear Extended ..... 140 KIAS
V_{LO} Maximum Landing Gear Operating (Down) ..... 140 KIAS
V_{LO} Maximum Landing Gear Operating (Up) ..... 109 KIAS
V_{FE} Maximum Flaps Extended ..... 111 KIAS
V_{SSE} Safe Single-Engine ..... 82 KIAS
V_{MCA} Minimum Controllable ..... 56 KIAS
Maximum Emergency Gear Extension ..... 100 KIAS

V_{S1} Stall (Clean) ..... 57 KIAS
V_{SO} Stall (Gear and Flaps Down) ..... 55 KIAS

Final Approach (Normal) ..... 85 KIAS
Final Approach (Short Field MLW) ..... 75 KIAS
Final Approach (Engine Inoperative) ..... 90 KIAS

Demonstrated Crosswind Component ..... 17 Knots

NORMAL AND CROSSWIND TAKEOFF AND CLIMB

References:

Airplane Flying Handbook, POH PA-44-180, Commercial ACS

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:

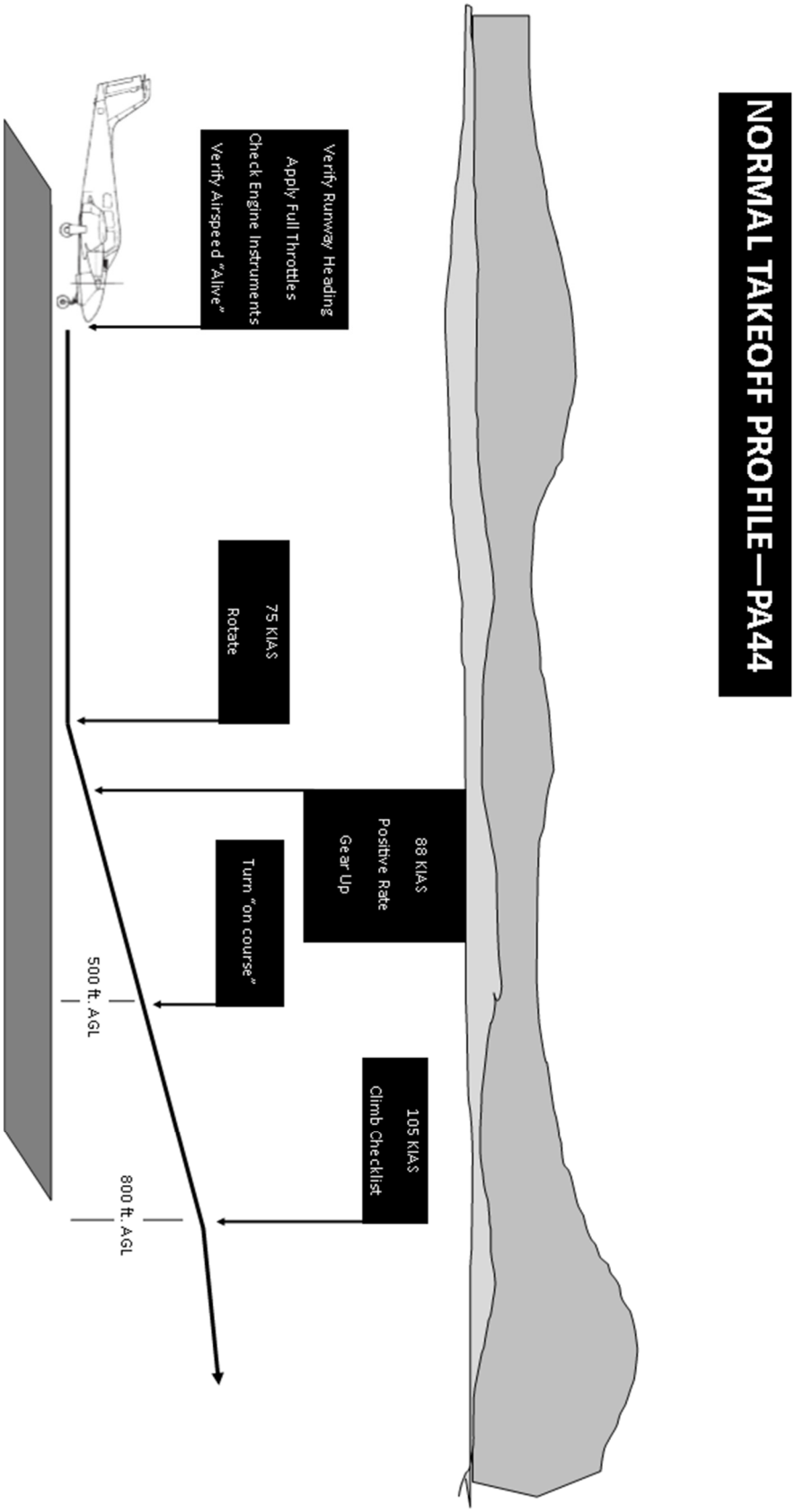
Develop the skills necessary to perform normal and crosswind takeoffs.

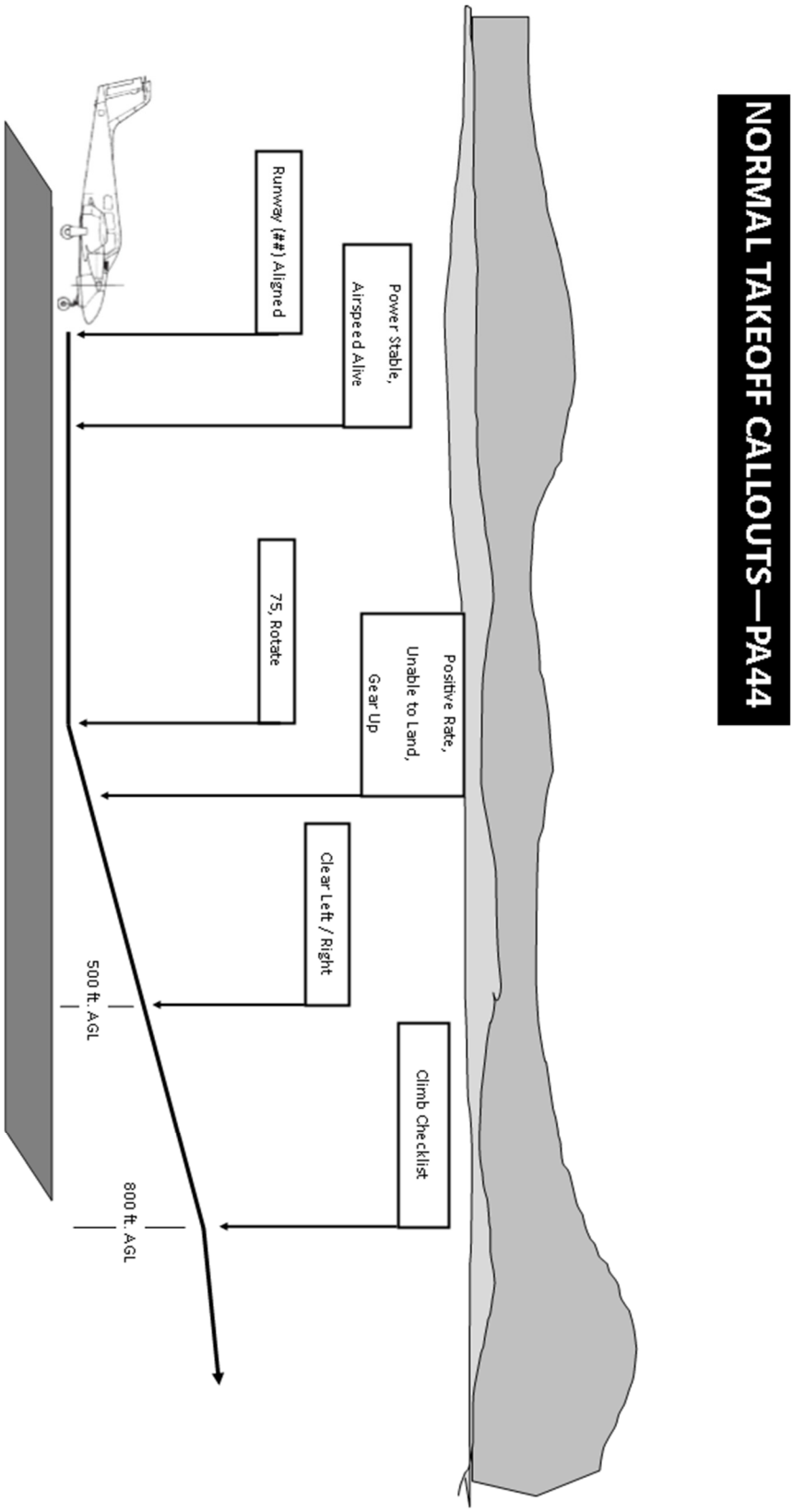
Procedure:

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 > Hold the brakes (unless executing an “immediate takeoff”)
5 > Throttles to 2000 RPM
6 > Verify that the engine instruments all indicate in the normal range
7 > Release the brakes
8 > Apply full throttles
9 > Apply appropriate control inputs to correct for crosswind
10 > Verify the airspeed is “alive”
11 > At 75 KIAS, rotate smoothly and allow the airplane to fly off the ground
12 > After liftoff, crab into the wind to maintain the runway centerline track
13 > Accelerate to V_Y (88 KIAS)
14 > After a positive rate of climb is established, tap the brakes and retract the landing gear
15 > 800 feet AGL, or higher safe altitude, transition to a cruise climb (105 KIAS at MTOW)
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.


NORMAL TAKEOFF PROFILE—PA44
Verify Runway Heading
Apply Full Throttles
Check Engine Instruments
Verify Airspeed "Alive"
75 KIAS
Rotate
88 KIAS
Positive Rate
Gear Up
Turn "on course"
500 ft. AGL
105 KIAS
Climb Checklist
800 ft. AGL


NORMAL TAKEOFF CALLOUTS—PA44
Runway (##) Aligned
Power Stable, Airspeed Alive
75, Rotate
Positive Rate, Unable to Land, Gear Up
Clear Left / Right
500 ft. AGL
Climb Checklist
800 ft. AGL

SHORT-FIELD TAKEOFF AND MAXIMUM PERFORMANCE CLIMB

References:

Airplane Flying Handbook, POH PA-44-180, Commercial ACS

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:

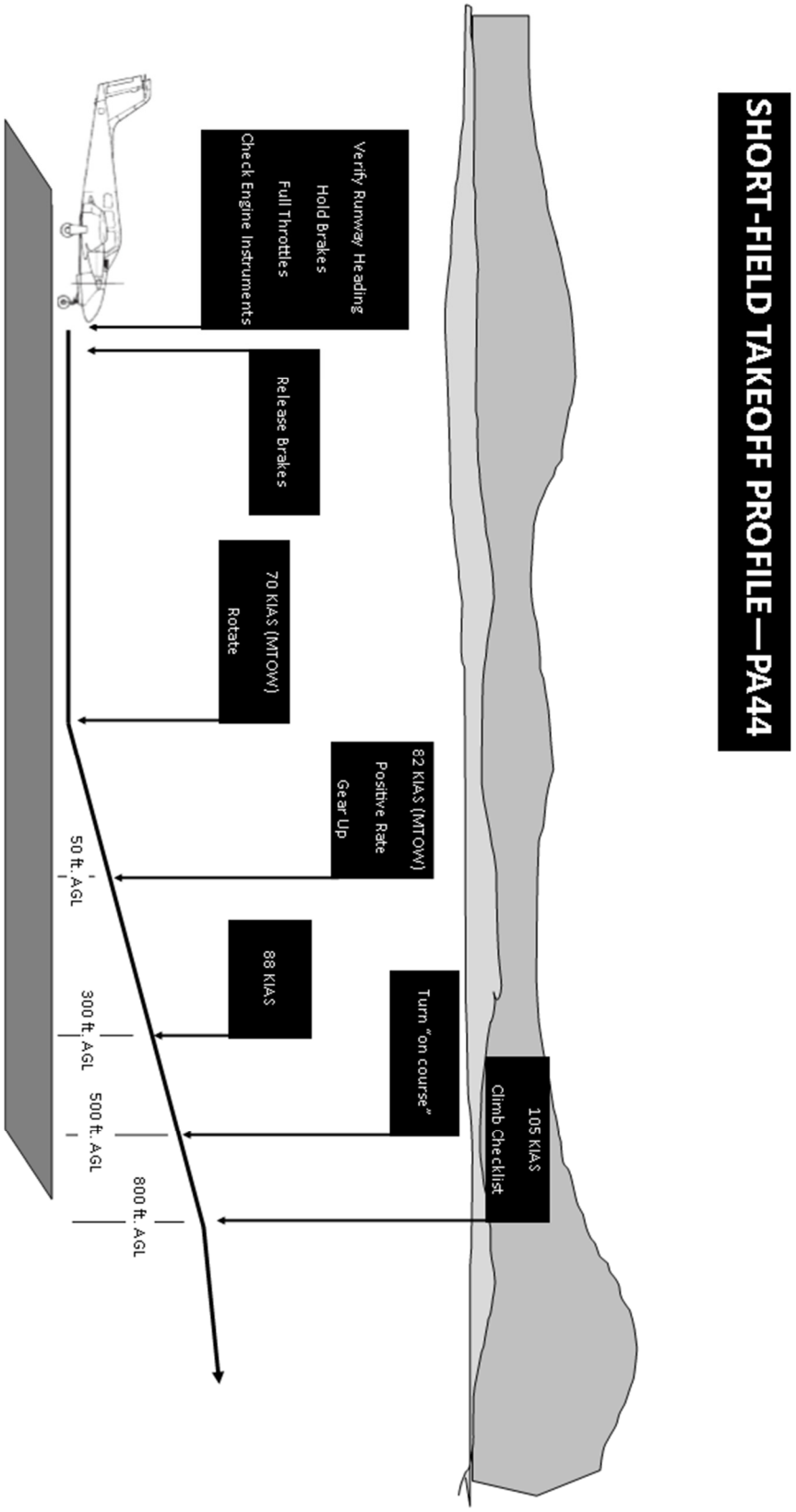
Develop the skills necessary to perform takeoffs on short runways and runways with obstacles present.

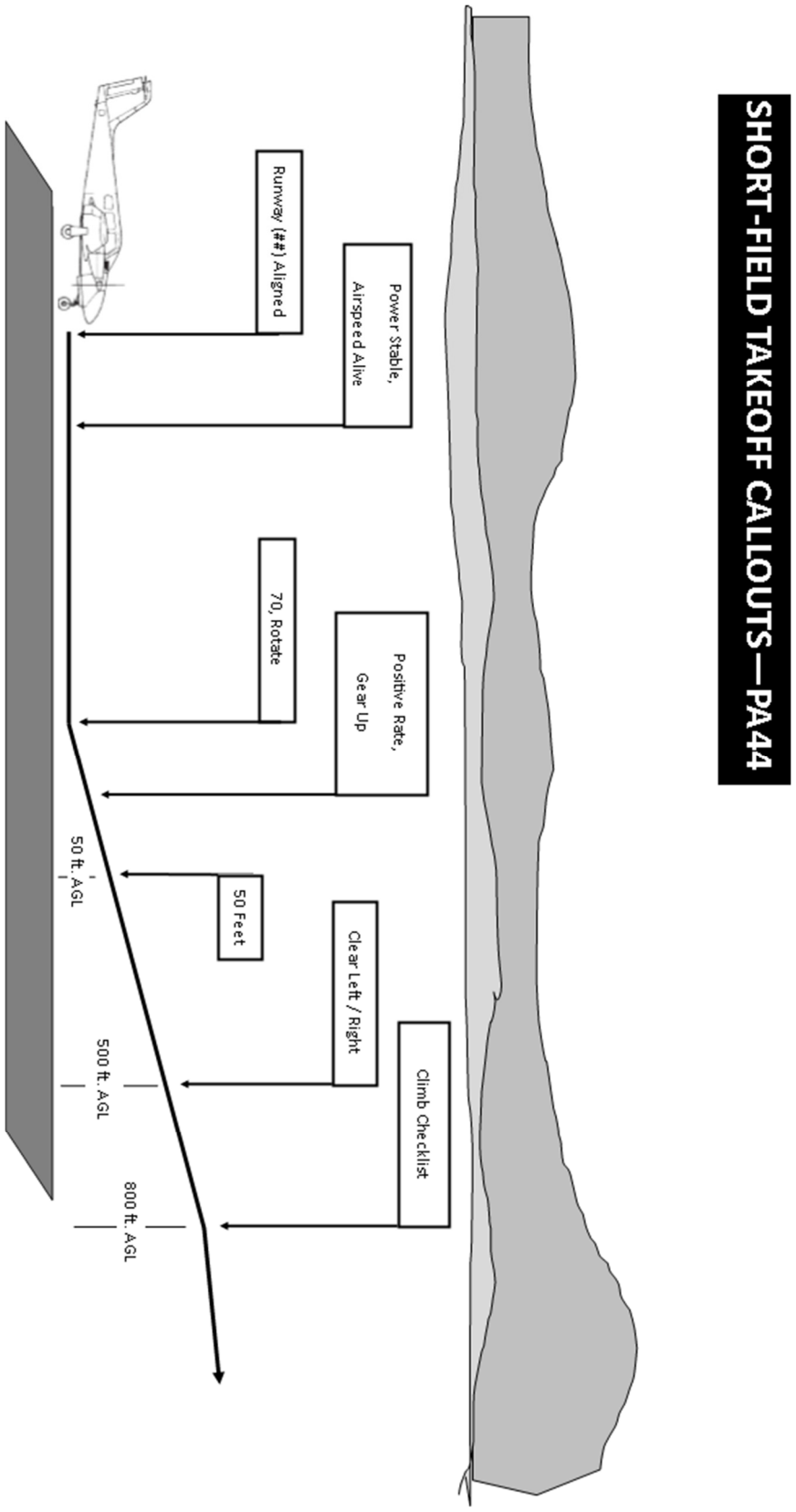
Procedure:

1 > Set the flaps to the 0^{O} 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 > Throttles to 2000 RPM
6 > Verify that the engine instruments all indicate in the normal range
7 > Apply full throttle
8 > Apply appropriate control inputs to correct for crosswind
9 > Verify the airspeed is “alive”
10 > At 70 KIAS (MTOW), apply back pressure to rotate and lift off the runway
11 > Crab into the wind to maintain the runway centerline track
12 > Accelerate to 82 KIAS (MTOW)
13 > After a positive rate of climb is established, tap the brakes and retract the landing gear
14 > 50 feet AGL and clear of the obstacle, accelerate to V_Y (88 KIAS at MTOW)
15 > 800 feet AGL, or higher safe altitude, transition to a cruise climb (105 KIAS at MTOW)
16 > Execute the climb checklist

Notes:

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

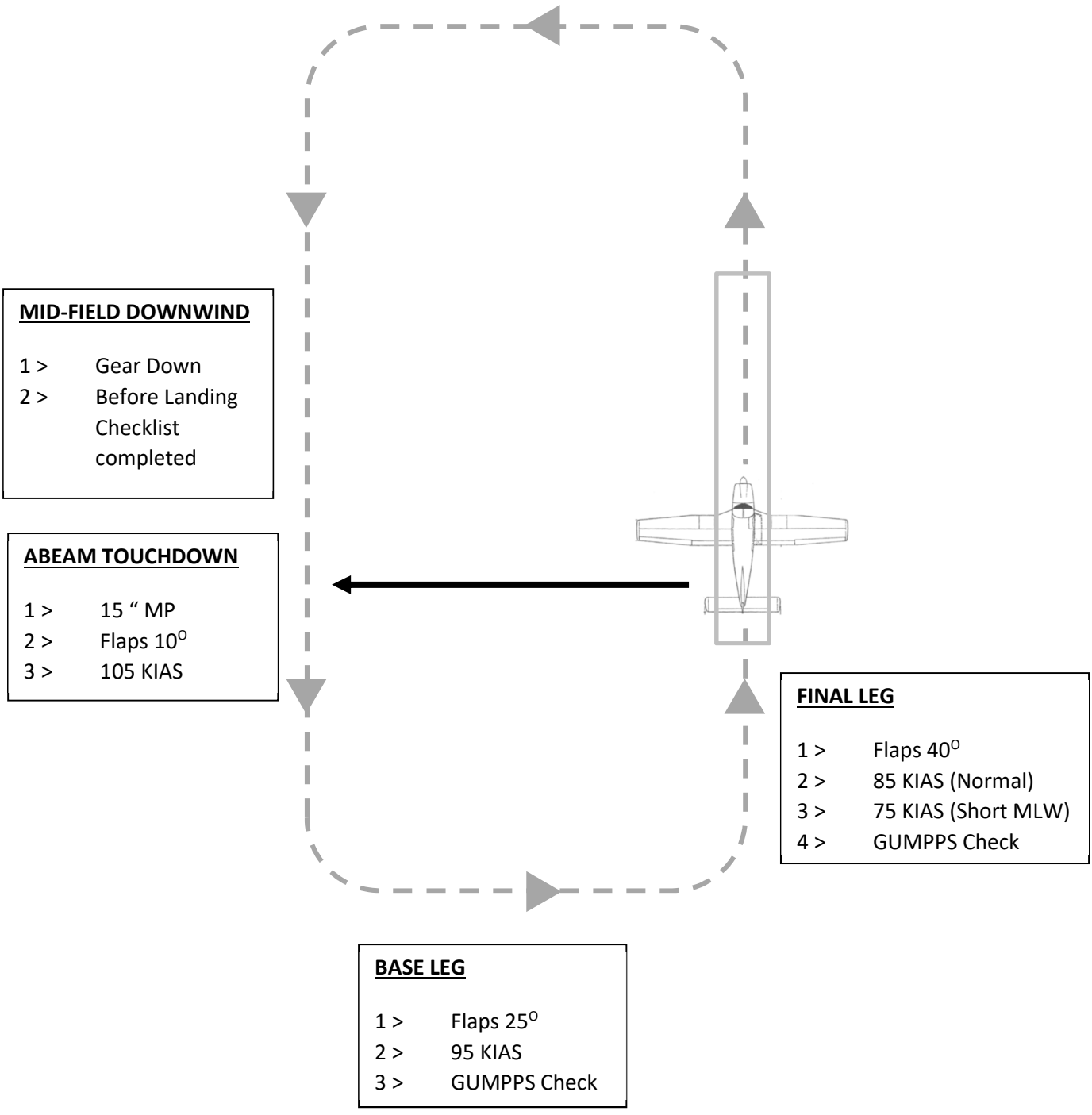

SHORT-FIELD TAKEOFF PROFILE—PA44
Verify Runway Heading
Hold Brakes
Full Throttles
Check Engine Instruments
Release Brakes
70 KIAS (MTOW)
Rotate
82 KIAS (MTOW)
Positive Rate
Gear Up
88 KIAS
Turn "on course"
105 KIAS
Climb Checklist
50 ft. AGL
300 ft. AGL
500 ft. AGL
800 ft. AGL


SHORT-FIELD TAKEOFF CALLOUTS—PA44
Runway (##) Aligned
Power Stable, Airspeed Alive
70, Rotate
Positive Rate, Gear Up
50 Feet
Clear Left / Right
Climb Checklist
50 ft. AGL
500 ft. AGL
800 ft. AGL

TRAFFIC PATTERN

References:

POH PA44-180



NORMAL AND CROSSWIND APPROACH AND LANDING

References:

Airplane Flying Handbook, POH PA-44-180, Commercial ACS

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 > At the mid-field downwind, extend the landing gear (below 140 KIAS) and verify “3 green”
3 > Designate the point of intended touchdown
4 > Abeam the touchdown point
   a. Reduce power (approximately 15” MP)
   b. Flaps 10^{O}
   c. Airspeed 105 KIAS
5 > On the base leg
   a. Flaps 25^{O}
   b. Airspeed 95 KIAS
   c. GUMPPS Check
6 > On final
   a. Flaps 40^{O}
   b. Airspeed 85 KIAS
   c. GUMPPS Check
7 > If crosswind conditions are encountered, use a side slip to maintain the correct ground track and runway alignment
8 > Reduce the throttles and increase the pitch attitude in order to smoothly touchdown at the intended landing point as the throttle reaches idle
9 > After touchdown, apply the brakes as required and increase crosswind control input as necessary

SHORT-FIELD APPROACH AND LANDING

References:

Airplane Flying Handbook, POH PA-44-180, Commercial ACS

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 > At the mid-field downwind, extend the landing gear (below 140 KIAS) and verify "3 green"
3 > Designate the point of intended touchdown
4 > Abeam the touchdown point
   a. Reduce power (approximately 15" MP)
   b. Flaps 10^{O}
   c. Airspeed 95 KIAS
5 > On the base leg
   a. Flaps 25^{O}
   b. Airspeed 85 KIAS
   c. GUMPPS Check
6 > On final
   a. Flaps 40^{O}
   b. Airspeed 75 KIAS (at MLW)
   c. GUMPPS Check
7 > If crosswind conditions are encountered, use a side slip to maintain the correct ground track and runway alignment
8 > Reduce the throttles and increase the pitch attitude in order to smoothly touchdown at the intended landing point as the throttle reaches idle
9 > Touch down at a full stall with the main gear first
10 > After touchdown, retract flaps as required for maximum braking
11 > 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.

APPROACH AND LANDING WITH AN INOPERATIVE ENGINE (SIMULATED)

References:

Airplane Flying Handbook, POH PA-44-180, Commercial ACS

Description:

The landing technique when the one engine is inoperative.

Objective:

Develop the skills associated with an approach and landing with an engine inoperative, including engine failure on final approach.

Procedure:

1 > Complete the before landing checklist prior to the mid-field downwind
2 > At the mid-field downwind, extend the landing gear (below 140 KIAS) and verify "3 green"
3 > Designate the point of intended touchdown
4 > Abeam the touchdown point
   a. Reduce power (approximately 15" MP)
   b. Airspeed 105 KIAS
5 > On the base leg
   a. Flaps 10^{O}
   b. Airspeed 95 KIAS
   c. GUMPPS Check
6 > On final
   a. Flaps 25^{O}
   b. Airspeed 90 KIAS
   c. GUMPPS Check
7 > If crosswind conditions are encountered, use a side slip to maintain the correct ground track and runway alignment
8 > Reduce the throttle on inoperative engine and increase the pitch attitude in order to smoothly touchdown at the intended landing point as the throttle reaches idle
9 > After touchdown, apply the brakes as required and increase crosswind control input as necessary while reducing the simulated inoperative engines throttle to idle

Notes:

Maximum flap deflection of 25 degrees should be used for engine inoperative approach and landing

Do not use speeds below V_{YSE} (88 KIAS) during engine inoperative pattern operations

If circumstances permit, avoid making unnecessary turns into the inoperative engine during traffic pattern operations

GO-AROUND / REJECTED LANDING

References:

Airplane Flying Handbook, POH PA-44-180, Commercial ACS

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:

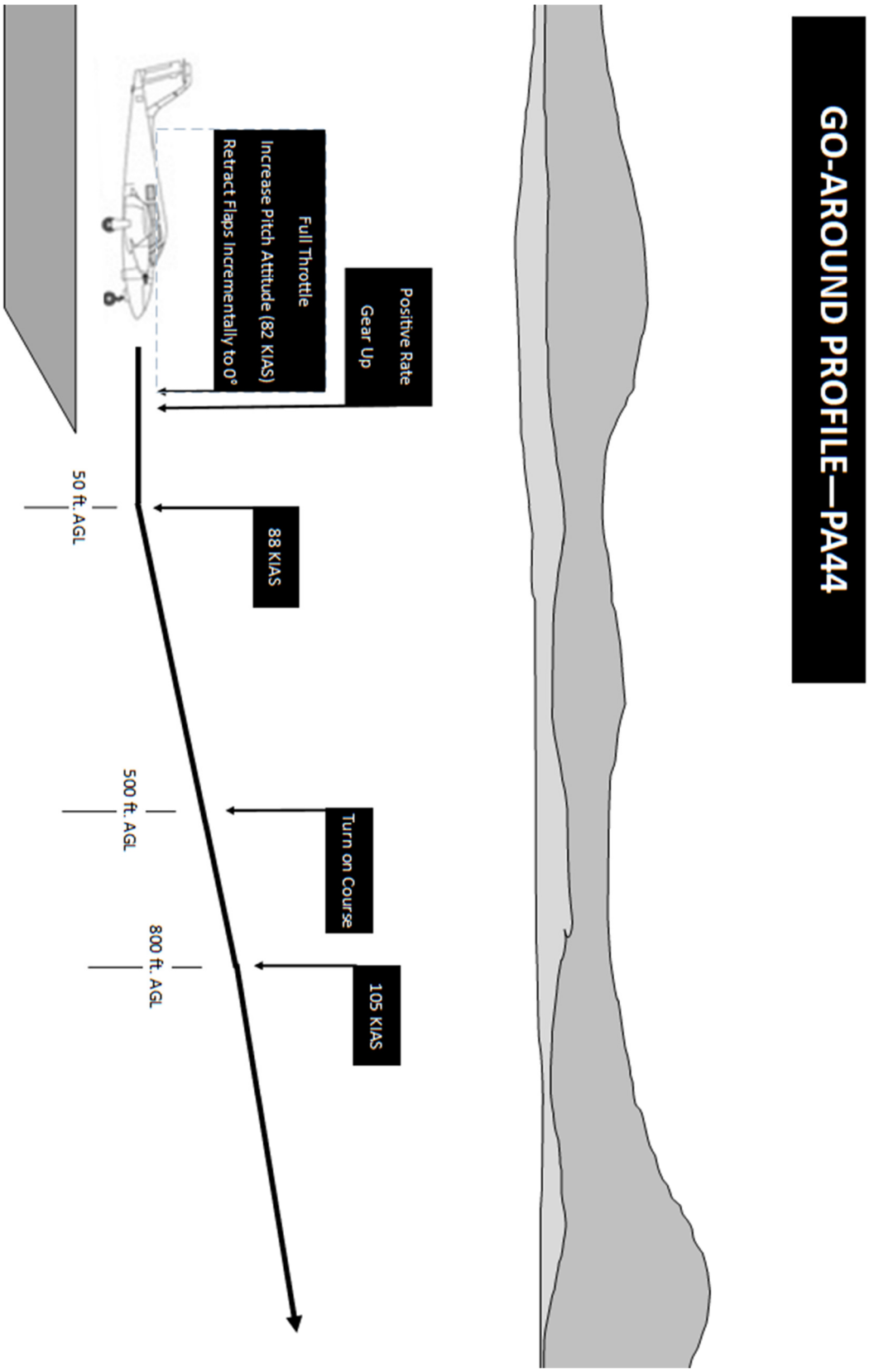
Develop the skills necessary to safely reject a landing by applying the proper procedures.

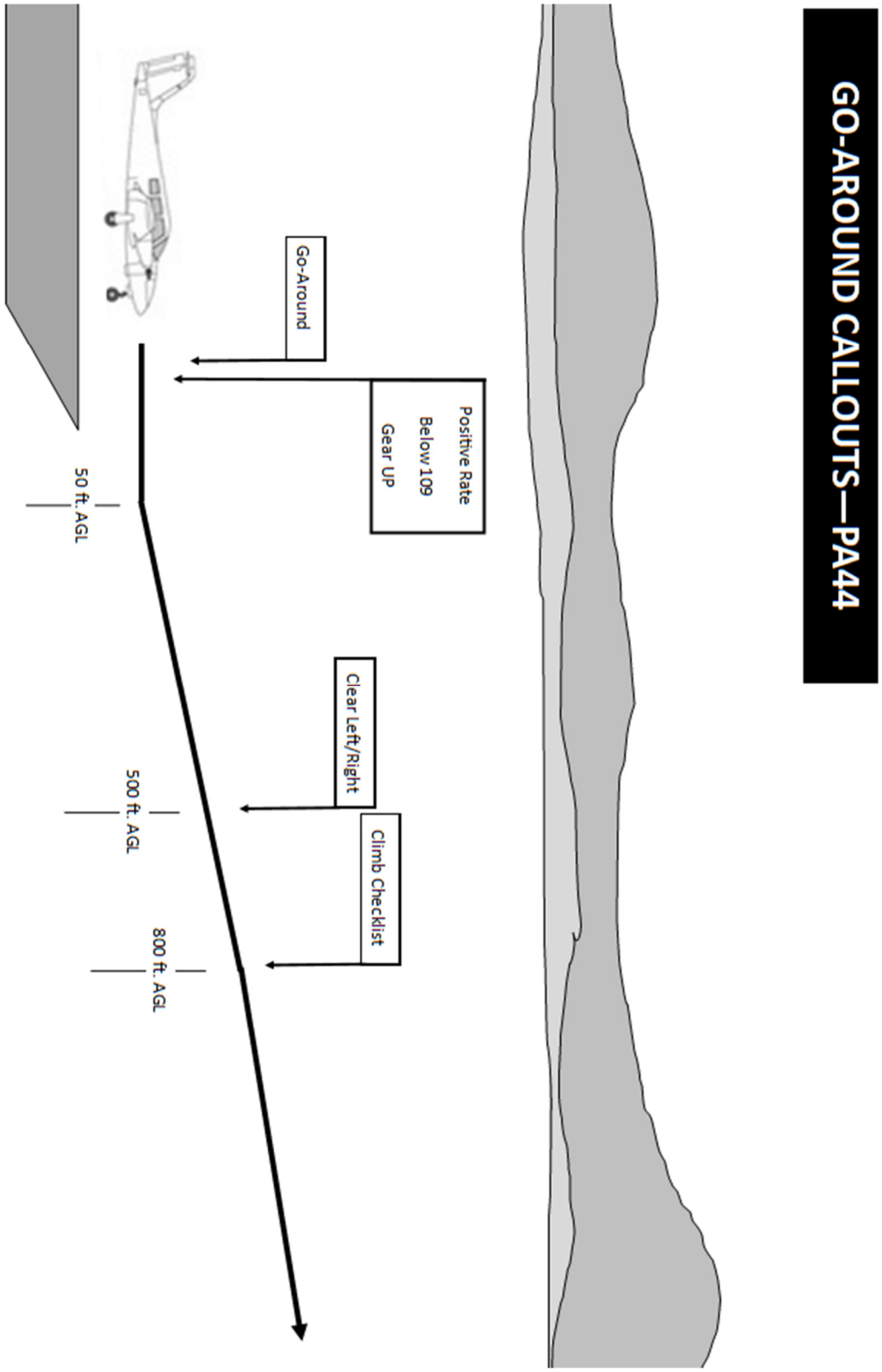
Procedure:

1 > *POWER UP*: Ensure the propeller levers are full forward and apply full throttles
2 > *PITCH UP*: Increase pitch attitude to initiate a climb at V_X
1 > *CLEAN UP*: Retract flaps incrementally to 0^O
Retract the gear (below 109 KIAS)
3 > Maintain V_X (82 KIAS gear up at MTOW) until clear of any obstacle
4 > 50 feet AGL and clear of the obstacle, accelerate to V_Y (88 KIAS, gear down at MTOW)
5 > *SPEAK UP*: Announce to tower (or CTAF) that you are "going around"
6 > 800 feet AGL, or higher safe altitude, transition to a cruise climb (105 KIAS at MTOW)
7 > Execute the climb checklist

Notes:

The pilot must retract the flaps carefully to avoid a negative vertical speed.


GO-AROUND PROFILE—PA44
Full Throttle
Increase Pitch Attitude (82 KIAS)
Retract Flaps Incrementally to 0°
Positive Rate
Gear Up
50 ft. AGL
88 KIAS
500 ft. AGL
Turn on Course
800 ft. AGL
105 KIAS


GO-AROUND CALLOUTS—PA44
Go-Around
Positive Rate
Below 109
Gear UP
50 ft. AGL
Clear Left/Right
500 ft. AGL
Climb Checklist
800 ft. AGL

GO-AROUND / REJECTED LANDING WITH AN INOPERATIVE ENGINE

References:

Airplane Flying Handbook, POH PA-44-180, Commercial ACS

Description:

The maneuver that is used when a landing is rejected with an inoperative engine. 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 with an inoperative engine by applying the proper procedures.

Procedure:

2 > *POWER UP*: Ensure the propeller lever is full forward and apply full throttle on the operative engine

3 > *PITCH UP*: Increase pitch attitude to initiate a climb at V_X

4 > *CLEAN UP*: Retract flaps incrementally to 0^O
Retract the gear (below 109 KIAS)

5 > Maintain V_X (82 KIAS gear up at MTOW) until clear of any obstacle

6 > 50 feet AGL and clear of the obstacle, accelerate to V_Y (88 KIAS)

7 > *SPEAK UP*: Announce to tower (or CTAF) that you are "going around"

8 > 300 feet AGL, maintain 88 KIAS with a zero side-slip and adjust cowl flaps, as required

9 > 800 feet AGL, execute the climb checklist

Notes:

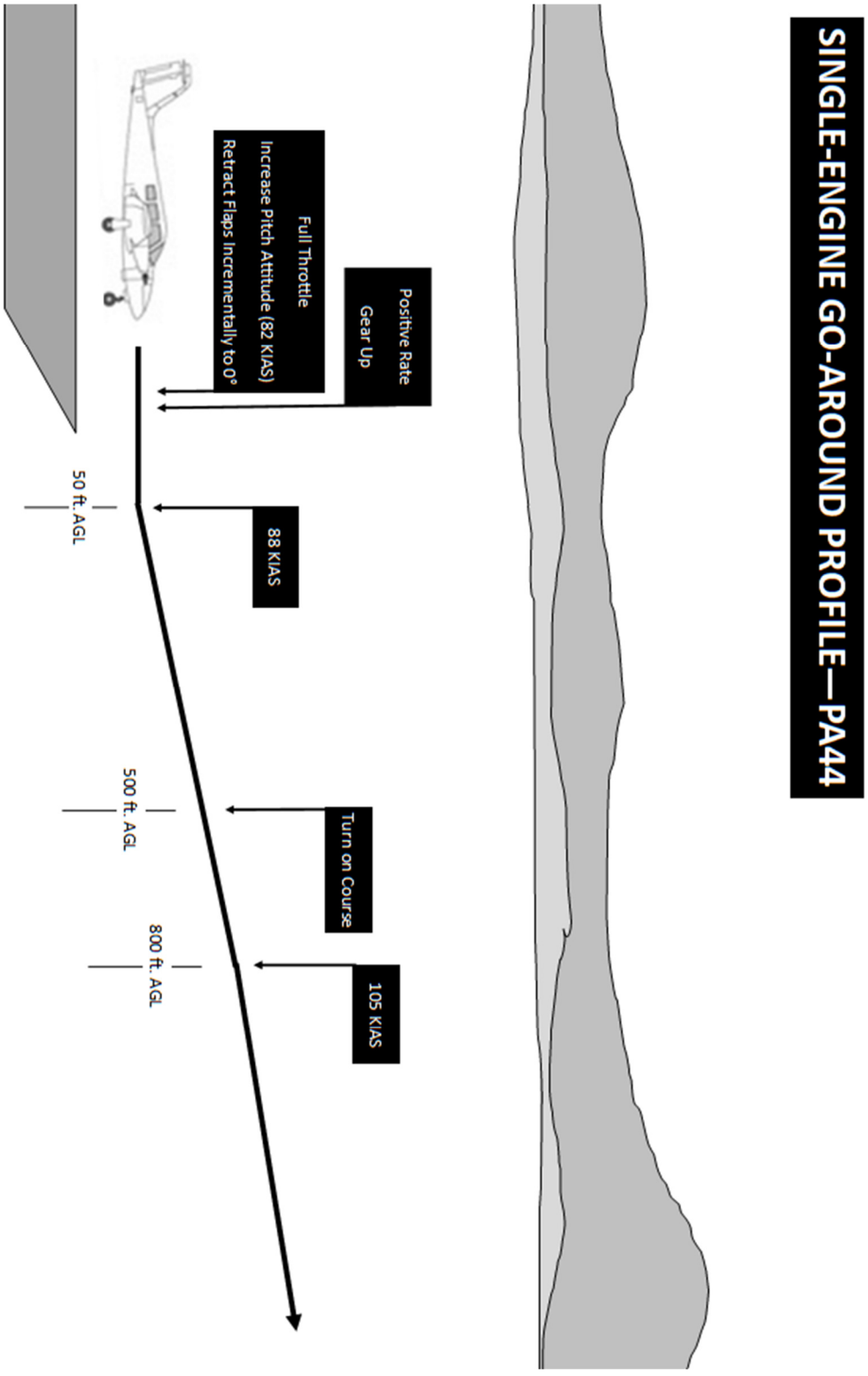
Under some conditions of loading and density altitude, aircraft single engine climb performance and obstacle clearance may make a one engine inoperative go-around impossible. Sudden application of power during one engine inoperative operation can make control of the airplane more difficult.

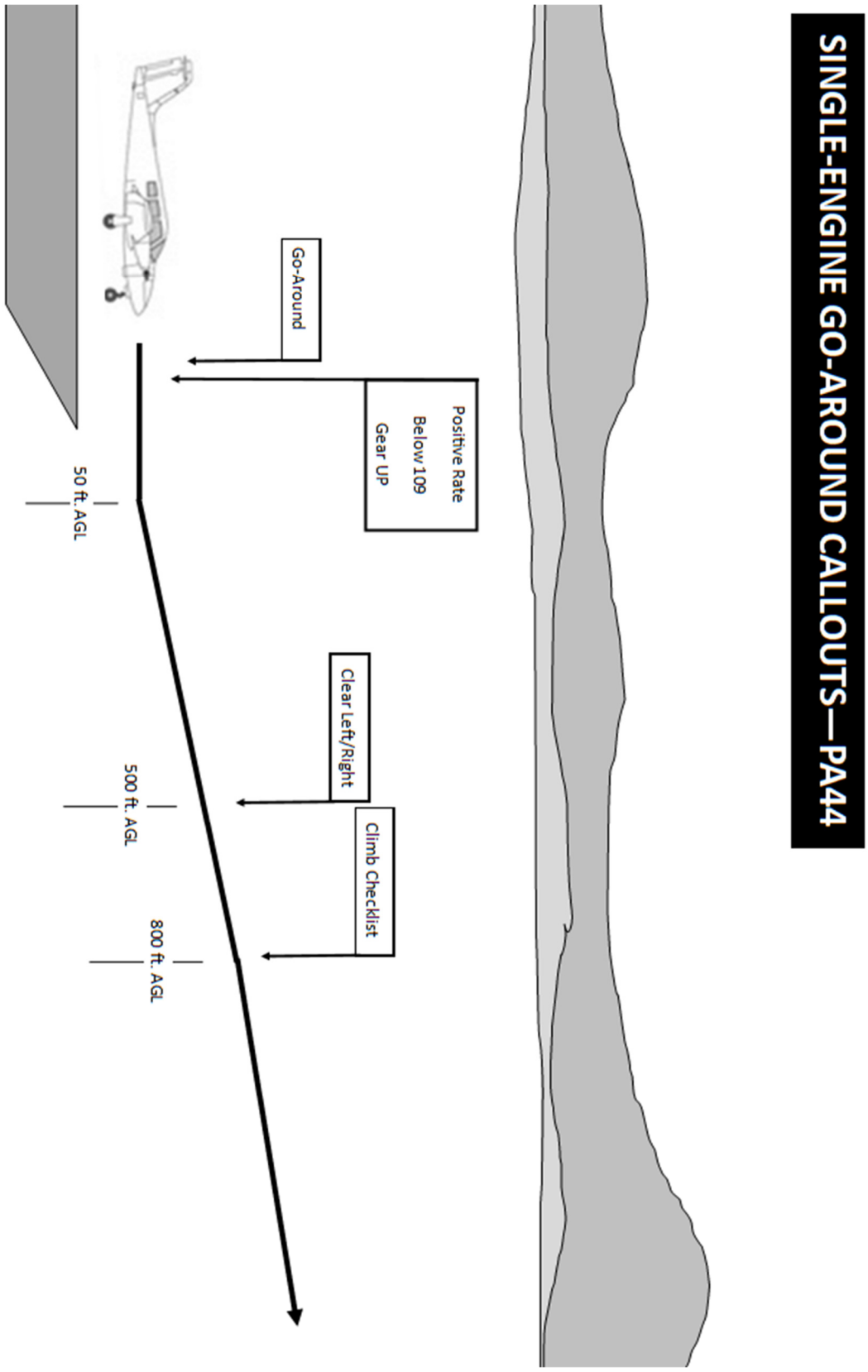
The propeller on the inoperative engine must be feathered, the landing gear retracted, and the wing flaps retracted for continued flight.

A one engine inoperative go-around should be avoided if at all possible.

For training purposes, a single engine go-around must not be initiated below 400 feet AGL or below $V_{SSE}/V_X/V_Y$.

The pilot must retract the flaps carefully to avoid a negative vertical speed.


SINGLE-ENGINE GO-AROUND PROFILE—PA44
Full Throttle
Increase Pitch Attitude (82 KIAS)
Retract Flaps Incrementally to 0°
Positive Rate
Gear Up
50 ft. AGL
88 KIAS
500 ft. AGL
Turn on Course
800 ft. AGL
105 KIAS


SINGLE-ENGINE GO-AROUND CALLOUTS—PA44
Go-Around
Positive Rate
Below 109
Gear UP
50 ft. AGL
Clear Left/Right
500 ft. AGL
Climb Checklist
800 ft. AGL

STEEP TURNS

References:

Airplane Flying Handbook, POH PA-44-180, Commercial ACS

Description:

This maneuver consists of two 360^{O} turns in opposite directions, while maintaining the airplane in level flight with a 50^{O} 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 3000 feet AGL
4 > Select a ground reference point and note the corresponding heading for entry and exit
5 > Establish an airspeed of 120 KIAS (or V_A if V_A is less than 120 KIAS based on actual weight)
6 > Roll into a coordinated left or right 50^{O} bank turn
7 > Adjust pitch to maintain altitude
8 > Adjust power to maintain airspeed (add approximately 10% of entry MP setting)
9 > Begin the rollout approximately 25^{O} 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

V_{MC} DEMONSTRATION

References:

Airplane Flying Handbook, POH PA-44-180, Commercial ACS

Description:

This maneuver is meant to simulate the recovery procedures for an engine failure below V_{MC}. Under no circumstance should an attempt be made to fly at a speed below V_{MC} with only one engine operating.

Objective:

Develop the pilot's skills associated with loss of control below V_{MC}.

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 4,000 feet AGL
4 > Establish an airspeed of 88 KIAS
5 > Configure the aircraft in a V_{MC} configuration:
   a. Cowl flaps: OPEN
   b. Gear: UP
   c. Flaps: UP
   d. Propellers: FULL FORWARD
6 > Reduce the throttle to idle on the simulated engine
7 > Increase throttle on the simulated operative engine to full
8 > Increase pitch as to decrease airspeed by approximately 1 knot per second
9 > Maintain directional control by applying the necessary amounts of rudder and aileron (no more than 5^{O} of bank)
10 > Initiate recovery at the first indication of loss of control (e.g. stall warning, buffet, "red line," or loss of directional control)
11 > Recover by simultaneously reducing power on the operative engine to idle and reducing angle of attack to increase airspeed to V_{SSE} or V_{YSE}, as appropriate
12 > Maintain heading (+/- 20^{O}) by reducing rudder and aileron inputs as the power on the operative engine is reduced
13 > Smoothly apply full throttle on the operative engine to aid with acceleration to a safe climb speed while maintaining heading with rudder and aileron inputs
14 > Resume straight and level flight on the assigned heading and altitude

DRAG DEMONSTRATION

References:

Airplane Flying Handbook, POH PA-44-180, Commercial ACS

Description:

This maneuver is meant to simulate the effects of various airspeeds and configurations during engine inoperative performance.

Objective:

Develop the pilot's skills associated with single engine operations in different airspeeds and configurations.

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 > Establish an airspeed of 88 KIAS
5 > Configure the aircraft:
    a. Cowl flaps: OPEN
    b. Gear: UP
    c. Propellers: FULL FORWARD
6 > Reduce the throttle to idle on the simulated engine to zero thrust (2180 RPM at 88 KIAS)
7 > Increase throttle on the simulated operative engine to full
8 > Maintain heading through aileron and rudder inputs (no more than 5^{O} of bank towards the operative engine)
9 > Demonstrate the effect of sideslip condition by not banking toward the operating engine
10 > Reduce airspeed 10 knots below V_{YSE} – Note the change in descent rate
11 > Increase airspeed 10 knots above V_{YSE} – Note the change in descent rate
12 > Return to V_{YSE}
13 > Extend landing gear – Note the change in descent rate
14 > Extend flaps – Note the change in descent rate
15 > Reduce throttle to idle on the inoperative engine – Note the change in descent rate
16 > Recover: apply full throttles, flaps to 25^{O}, gear up (below 109 KIAS), flaps 10^{O}, flaps 0^{O}
17 > Resume straight and level flight on the assigned heading and altitude

MANEUVERING DURING SLOW FLIGHT

References:

Airplane Flying Handbook, POH PA-44-180, Commercial ACS

Description:

The airplane will not be flown at an airspeed below V_{MC} (Minimum controllable airspeed). The desired speed is such that any increase in load factor, increase in angle of attack, or decrease in power will result in a stall warning. Turns, descents, and climbs can be accomplished while maintaining that airspeed. The aircraft is flown in several 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.

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 > Select a ground reference point and note the corresponding heading
5 > Reduce the throttles to 15" MP
6 > Apply back pressure to maintain altitude as the airplane slows down
7 > Below V_{LO} (140 KIAS), extend the gear and verify "3 green"
8 > Slow the airplane to induce a stall warning. Then, note the speed and select a target speed above this that will eliminate the stall warning, and maintain this speed within ACS standards. If V_{MC} is reached prior to a stall warning, maintain V_{MC} within ACS standards.
9 > Below 100 KIAS, propeller controls full forward
10 > Perform a turn while maintaining airspeed and altitude
11 > Below V_{FE} (111), set flaps 10^{O}
12 > Repeat step 8 to find new target speed
13 > Perform a turn while maintaining airspeed and altitude
14 > Below V_{FE} (111), set flaps 25^{O}
15 > Repeat step 8 to find new target speed
16 > Perform a turn and a climb (can be accomplished separately or together as desired)
17 > Below V_{FE} (111), set flaps 40^{O}
18 > Repeat step 8 to find new target speed
19 > Perform a turn and a descent (can be accomplished separately or together as desired)
20 > Recover: apply full throttles, retract flaps incrementally to 0^{O}, gear up (below 109 KIAS)
21 > Resume straight and level flight

POWER-OFF STALLS

References:

Airplane Flying Handbook, POH PA-44-180, Commercial ACS

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 3000 feet AGL
4 > Select a ground reference to simulate a runway
5 > Reduce the throttle to 15" MP
6 > Apply back pressure to maintain altitude as the airplane slows to approach speed
7 > Below V_{LO} (140 KIAS), extend the gear and verify "3 green"
8 > Below V_{FE} (111 KIAS), incrementally extend the flaps to 40^{O}
9 > Below 100 KIAS, propeller controls full forward
10 > Establish a descent at approach speed (85 KIAS)
11 > Reduce throttle to idle
12 > Increase pitch attitude to induce a stall
13 > Announce the indications of the stall (aural alert, buffet, loss of control effectiveness etc.)
14 > Recover: apply full throttles, reduce the angle of attack, retract flaps incrementally to 0^{O}
15 > Establish a climb at V_X (82 KIAS)
16 > After a positive rate of climb is established, gear up (below 109 KIAS)
17 > Establish a climb at V_Y (88 KIAS)
18 > Climb to a specified altitude
19 > Resume straight and level flight

Notes:

This maneuver should also be practice while in turns using up to a 20^{O} angle of bank

POWER-ON STALLS

References:

Airplane Flying Handbook, POH PA-44-180, Commercial ACS

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 3000 feet AGL
4 > Reduce the throttle to 15" MP
5 > Apply back pressure to maintain altitude as the airplane slows to rotation speed
6 > Below V_{LO} (140 KIAS), extend the gear and verify "3 green"
7 > Below 100 KIAS, propeller control full forward
8 > At rotation speed (normal 75 KIAS), increase throttle (not less than 65% BHP)
9 > Increase pitch attitude to induce a stall
10 > Announce the indications of the stall (aural alert, buffet, loss of control effectiveness etc.)
11 > Recover: apply full throttles and reduce the angle of attack
12 > Establish a climb at V_X (82 KIAS)
13 > After a positive rate of climb is established, gear up (below 109 KIAS)
14 > Establish a climb at V_Y (88 KIAS)
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^O 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 PA-44-180, Commercial ACS

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 throttles to 15" MP
5 > Apply back pressure to maintain altitude as the airplane slows down
6 > Below 100 KIAS, propeller controls full forward
7 > At 77 KIAS (V_{S1} + 20 kts) roll into a coordinated 45^{O} angle of bank turn
8 > Reduce throttles to idle
9 > Apply back pressure firmly to induce a stall
10 > Announce the indications of the stall (aural alert, buffet, loss of control effectiveness etc.)
11 > Recover: apply full throttles and reduce the angle of bank and back pressure
12 > Resume straight and level cruise

EMERGENCY DESCENTS

References:

Airplane Flying Handbook, POH PA-44-180, Commercial ACS

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 throttles to idle
4 > Below V_{LO} (140 KIAS), extend the gear and verify "3 green"
5 > Bank the airplane up to 45^{O} to begin the descent and maintain a 1 "G" load factor
6 > Adjust pitch to maintain 135 KIAS (+0/-10 knots) during the descent
7 > Propeller control (slowly and smoothly) full forward
8 > Lead the level off by 10% of the descent rate
9 > Level the airplane at the desired altitude and increase the throttle to a cruise MP setting
10 > Clean up (if not continuing to a landing): gear up (below 109)
11 > 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)

For training purposes, 135 knots is used to provide a safety buffer off of the 140 knot V_{LE} limitation.

ENGINE FAILURE DURING TAKEOFF BEFORE V_{MC}

References:

Airplane Flying Handbook, POH PA-44-180, Commercial ACS

Description:

This maneuver simulates an engine failure during the takeoff roll prior to reaching V_{MC}.

Objective:

Develop the pilot's skills associated with an engine failure during takeoff before V_{MC}.

Procedure:

1 > The Instructor / Examiner simulates an engine failure (e.g. mixture reduction, throttle reduction, verbal command)
2 > Close the throttles smoothly and promptly when the simulated engine failure occurs
3 > Maintain directional control through rudder inputs
4 > Apply brakes to stop the aircraft
5 > Secure engine

Notes:

The simulated engine failure must be initiated prior to reaching 50% of V_{MC}

ENGINE FAILURE AFTER TAKEOFF (SIMULATED)

References:
Airplane Flying Handbook, POH PA-44-180, Commercial ACS

Description:
This maneuver simulates an engine failure after liftoff.

Objective:
Develop the pilot's skills associated with an engine failure after liftoff.

Procedure:
1 > The Instructor / Examiner simulates an engine failure by bringing one throttle to idle
2 > Recognize a simulated engine failure and maintain control
3 > Maintain V_{YSE} (or V_{XSE} if obstacles are present)
4 > POWER UP: Mixtures, propellers and throttles full forward
5 > CLEAN UP: Retract flaps (if necessary)
6 > IDENTIFY: Identify the inoperative engine
7 > VERIFY: Bring the throttle of the inoperative engine half way back to verify and then full idle
8 > FEATHER: Simulate feathering the inoperative engine by pulling the appropriate propeller into the Instructor / Examiner's finger
9 > The Instructor / Examiner should then simulate zero-thrust on the inoperative engine
10 > Bank towards the operating engine as required for best performance
11 > Recognize the airplane's performance capabilities to determine best course of action
    a. Return for landing if performance allows
    b. Find a suitable landing area if performance does not allow
12 > Complete appropriate checklists (time and workload permitting)

Notes:
The simulated engine failure must be initiated above 400 feet AGL.

This procedure is assuming the gear is already retracted or in transit.

It is the responsibility of the Instructor / Examiner to place their hand behind the propeller levers to allow the student the opportunity to reinforce the motor skills associated with feathering an inoperative engine in this time constrained, high workload environment.

MANUEVERING WITH ONE ENGINE INOPERATIVE

References:
Airplane Flying Handbook, POH PA-44-180, Commercial ACS

Description:
This maneuver simulates an engine failure during cruise flight.

Objective:
Develop the pilot's skills associated with one engine inoperative.

Procedure:
1 > The Instructor / Examiner simulates an engine failure (e.g. shutting off fuel, closing a mixture, closing a throttle)
2 > Recognize a simulated engine failure and maintain control
3 > Perform initial memory items:
    a. *POWER UP:* Mixtures, propellers and throttles full forward
    b. *CLEAN UP:* Retract gear and flaps
    c. *IDENTIFY:* Identify the inoperative engine
    d. *VERIFY:* Bring the throttle of the inoperative engine half way back and then full idle to verify, but bring the throttle back to half open after the inoperative engine has been verified
    e. *TROUBLESHOOT:* Perform these steps from memory
4 > Confirm all steps have been completed accurately by confirming with the checklist
5 > If unable to restart the engine, complete the "*ENGINE SECURING*" checklist
6 > Reduce drag by banking towards the operating engine and proper inclinometer displacement toward the operating engine as required for best performance
7 > Monitor the operating engine and make adjustments as necessary
8 > Demonstrate coordinated flight with one engine inoperative
9 > Restart the inoperative engine using the "*AIR START*" checklist
10 > Resume straight and level cruise

Notes:
If the outside air temperature is below -15^{O} C, engine shutdowns are not permitted

If unable to maintain altitude during this maneuver, maintain minimum sink rate.

ENGINE FAILURE IN FLIGHT (BY REFERENCE TO INSTRUMENTS)

References:

Airplane Flying Handbook, POH PA-44-180, Commercial ACS

Description:

This maneuver simulates an engine failure during cruise flight by reference to instruments.

Objective:

Develop the pilot's skills associated with instrument flight with one engine inoperative.

Procedure:

1 > The Instructor / Examiner simulates an engine failure (e.g. shutting off fuel, closing a mixture, closing a throttle)

2 > Recognize a simulated engine failure and maintain control by reference to instruments

3 > Perform initial memory items:

- *a. POWER UP:* Mixtures, propellers and throttles full forward
- *b. CLEAN UP:* Retract gear and flaps
- *c. IDENTIFY:* Identify the inoperative engine
- *d. VERIFY:* Bring the throttle of the inoperative engine half way back and then full idle to verify, but bring the throttle back to half open after the inoperative engine has been verified
- *e. TROUBLESHOOT:* Perform these steps from memory

4 > Confirm all steps have been completed accurately by confirming with the checklist

5 > If unable to restart the engine, complete the "*ENGINE SECURING*" checklist

6 > Simulate reporting to ATC the nature of your emergency and any assistance required

7 > Reduce drag by banking towards the operating engine and proper inclinometer displacement toward the operating engine as required for best performance

8 > Monitor the operating engine and make adjustments as necessary

9 > Demonstrate coordinated flight with one engine inoperative

Notes:

If the outside air temperature is below -15^{O} C, engine shutdowns are not permitted

If unable to maintain altitude during this maneuver, maintain minimum sink rate and simulate advising ATC

This maneuver is meant to simulate an emergency on an IFR flight plan. To make this scenario as real as possible, simulate all required ATC communications to the Instructor / Examiner (e.g. vectors, approaches, altitude restrictions). The Instructor / Examiner will play the role of ATC and provide the student / applicant with all necessary assistance.

INSTRUMENT APPROACH AND LANDING WITH AN INOPERATIVE ENGINE (SIMULATED)

References:

Airplane Flying Handbook, POH PA-44-180, Commercial ACS

Description:

This maneuver simulates an engine failure during the approach phase of flight by reference to instruments

Objective:

Develop the pilot's skills associated with executing a published instrument approach with one engine inoperative

Procedure:

1 > The Instructor / Examiner simulates an engine failure
2 > Recognize a simulated engine failure and maintain control by reference to instruments
3 > Perform initial memory items:
    a. *POWER UP:* Mixtures, propellers and throttles full forward
    b. *CLEAN UP:* Retract gear and flaps
    c. *IDENTIFY:* Identify the inoperative engine
    d. *VERIFY:* Bring the throttle of the inoperative engine half way back and then full idle to verify, but bring the throttle back to half open after the inoperative engine has been verified
    e. *FEATHER:* Simulate feathering the inoperative engine by pulling the appropriate propeller into the Instructor / Examiner's finger
4 > Confirm all steps have been completed accurately by confirming with the checklist (workload and time permitting)
5 > Secure engine (time and workload permitting)
6 > Simulate reporting to ATC the nature of your emergency and any assistance required
7 > Reduce drag by banking towards the operating engine and proper inclinometer displacement toward the operating engine as required for best performance
8 > Monitor the operating engine and make adjustments as necessary
9 > Complete SIAP

Notes:

If unable to maintain altitude during this maneuver, maintain minimum sink rate and simulate advising ATC

If the situation allows, a restart/troubleshoot may be attempted

This maneuver is meant to simulate an emergency on an IFR flight plan. To make this scenario as real as possible, simulate all required ATC communications to the Instructor / Examiner (e.g. vectors, approaches, altitude restrictions). The Instructor / Examiner will play the role of ATC and provide the student / applicant with all necessary assistance.

PRECISION APPROACH

References:

Instrument Flying Handbook, POH PA-44-180, Instrument ACS

Description:

The aircraft is maneuvered to intercept the Glide Slope/Path of an ILS/LPV approach, and then descend to the DA using the Glide Slope/Path and localizer/course

Objective:

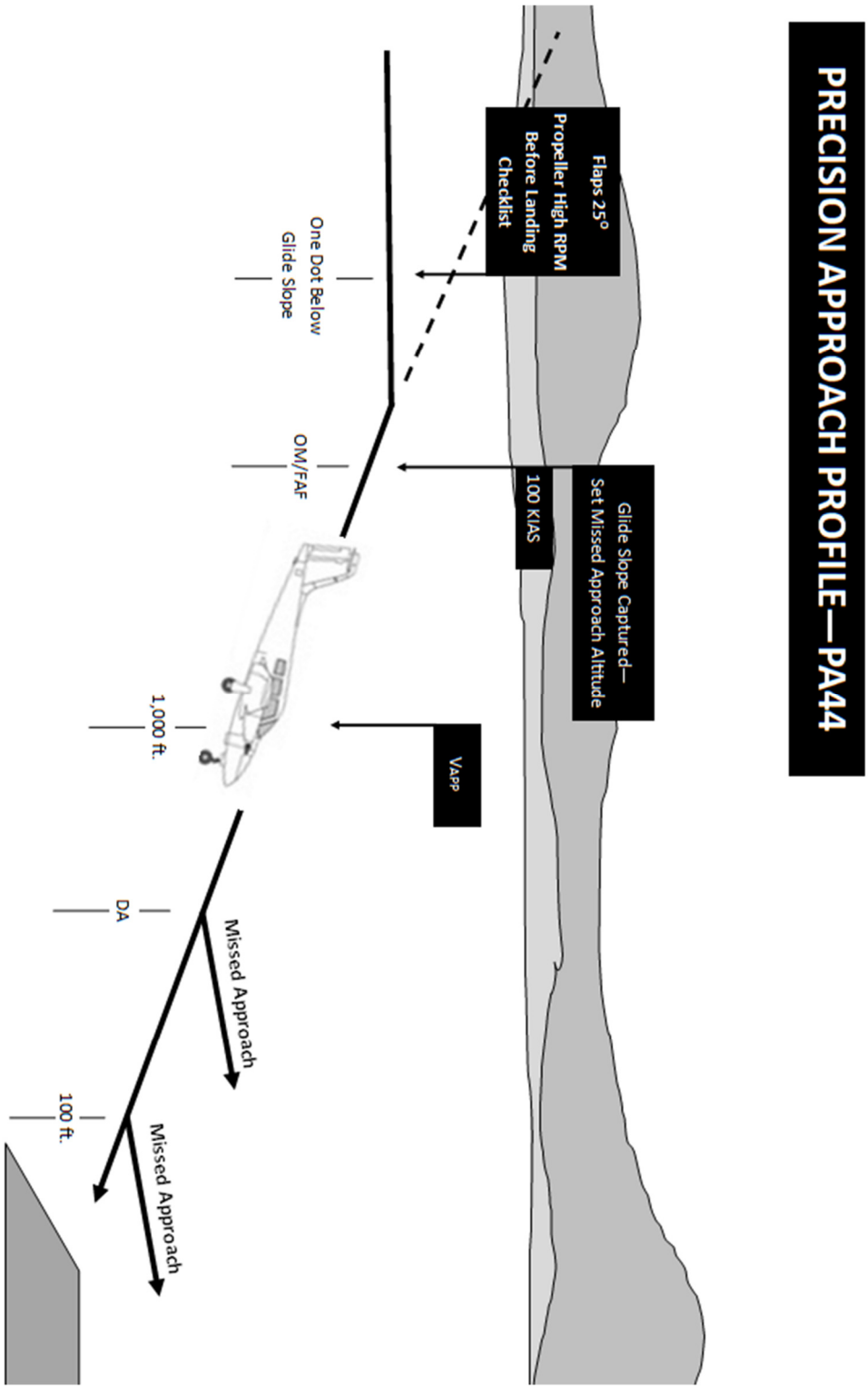
To develop the pilot's ability to safely execute ILS and LPV approaches

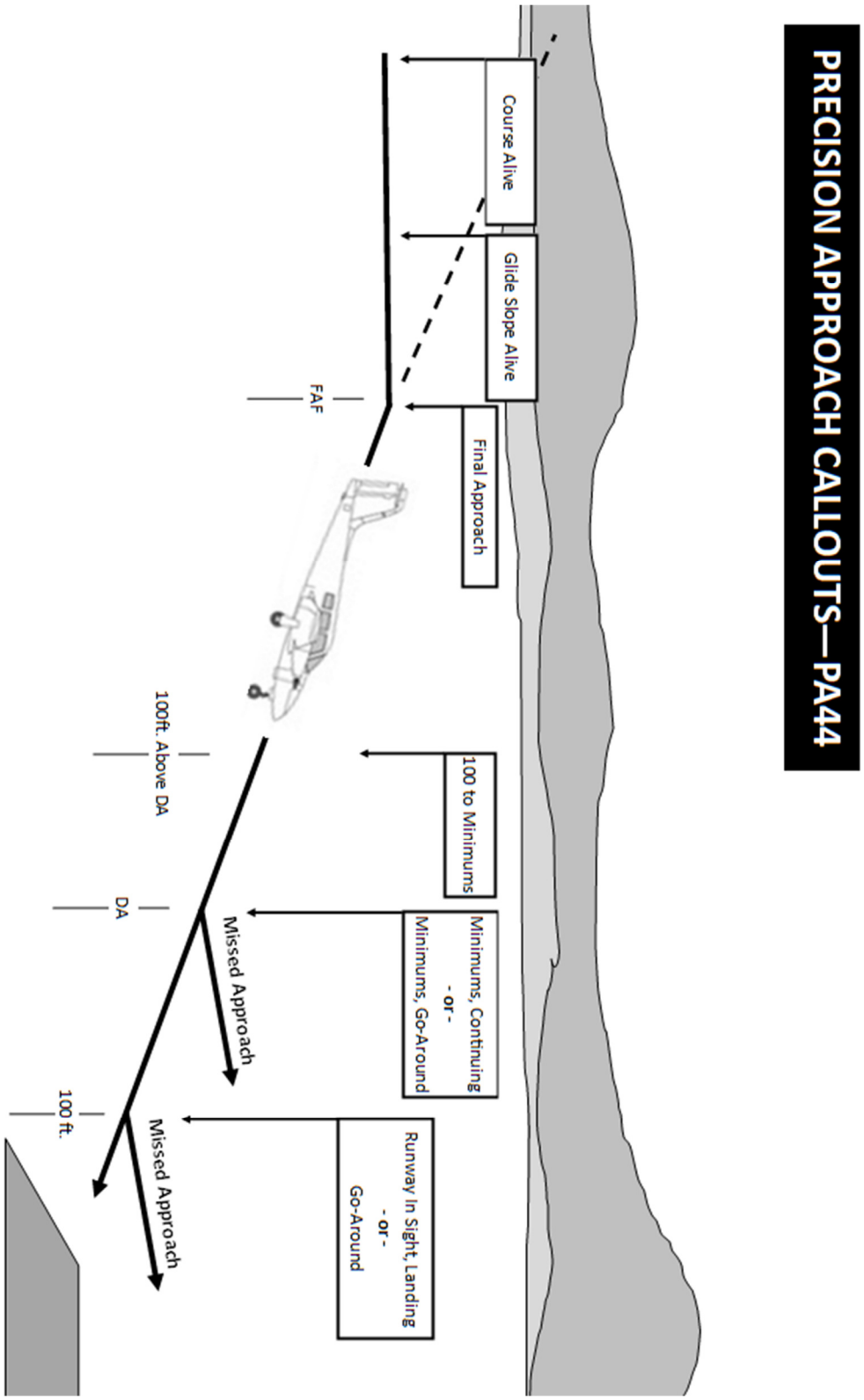
Procedure:

1 > As soon as practical, obtain the ATIS or local weather
2 > Once the appropriate approach has been determined, the pilot will setup, review, and brief the procedure
3 > When established inbound, reset the OBS to the inbound course
4 > Accomplish the before landing checklist and extend the landing gear
5 > Configure with 25 degrees flaps and propellers high RPM at 100 KIAS when one dot below the Glide Slope / Path
6 > At Glide Slope / Path intercept, begin descent while tracking the GS/GP to the decision altitude
7 > Set the altitude preselect to the MAP altitude
8 > Ensure a stabilized approach by 1000 feet above TDZE
9 > Execute a missed approach procedure whenever the runway environment is not in sight or a normal approach to landing cannot be made at the DA

Notes:

This procedure may be modified to comply with ATC requests within the aircraft and pilot's capabilities


PRECISION APPROACH PROFILE—PA44
Flaps 25°
Propeller High RPM
Before Landing
Checklist
One Dot Below
Glide Slope
OM/FAF
100 KIAS
Glide Slope Captured—
Set Missed Approach Altitude
1,000 ft.
VAPP
DA
Missed Approach
100 ft.
Missed Approach


PRECISION APPROACH CALLOUTS—PA44
Course Alive
Glide Slope Alive
Final Approach
FAF
100ft. Above DA
DA
100 ft.
100 to Minimums
Minimums, Continuing
- or -
Minimums, Go-Around
Missed Approach
Runway In Sight, Landing
- or -
Go-Around
Missed Approach

NON-PRECISION APPROACH

References:

Instrument Flying Handbook, POH PA-44-180, Instrument ACS

Description:

The aircraft is maneuvered to the final approach fix where a descent begins to the MDA. Types of non-precision approaches include: VOR, Localizer, Localizer Back Course, GPS, LDA, and SDF

Objective:

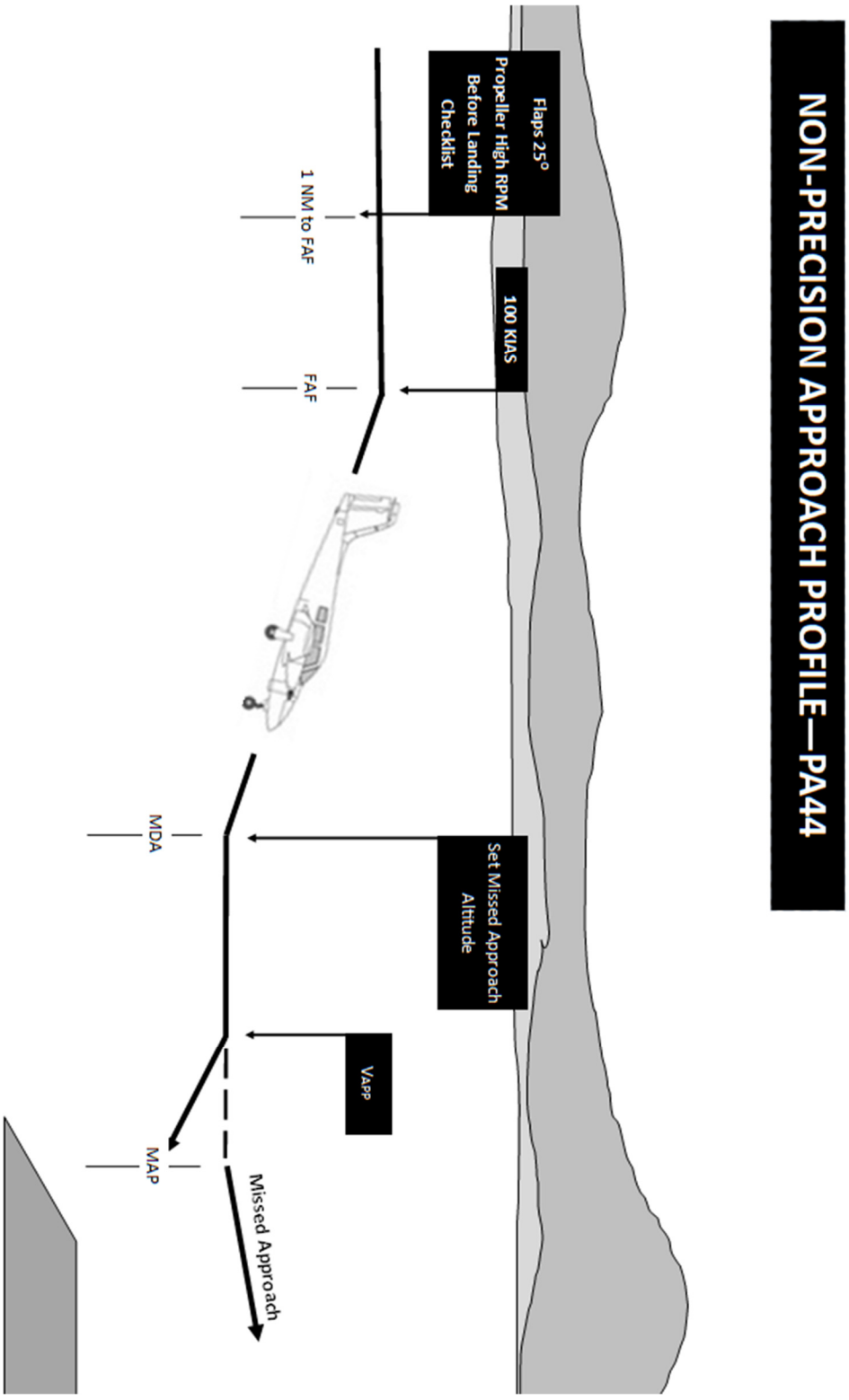
To develop the pilot's ability to safely execute non-precision approaches

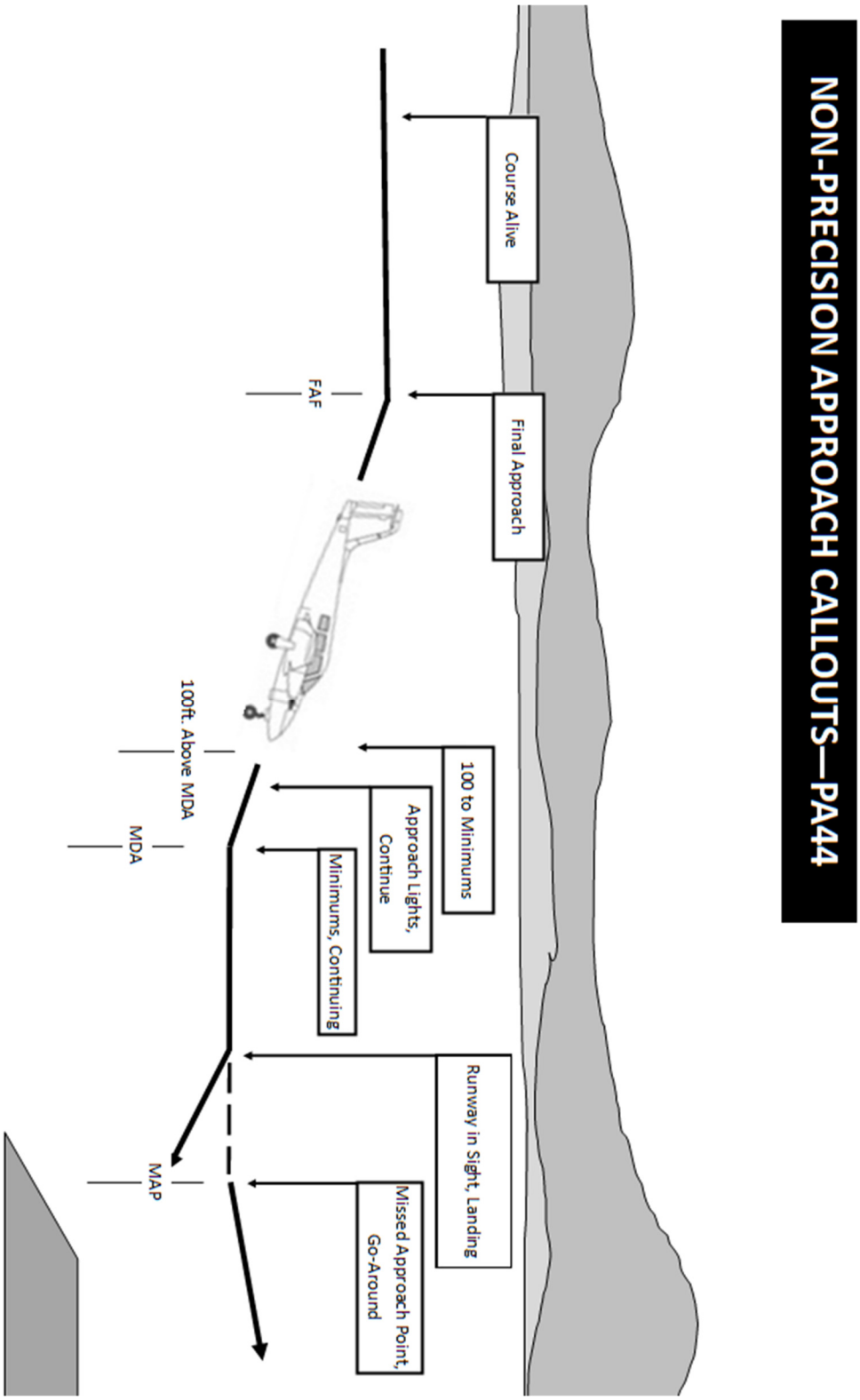
Procedure:

1 > As soon as practical, obtain the ATIS or local weather
2 > Once the appropriate approach has been determined, the pilot will setup, review, and brief the procedure
3 > When established inbound, reset the OBS to the inbound course
4 > Accomplish the before landing checklist and extend the landing gear
5 > Configure with 25 degrees flaps and propellers high RPM at 100 KIAS by 1 NM prior to the FAF
6 > At the FAF, begin time (if required to identify the MAP)
7 > After crossing the FAF, begin the descent to reach the MDA at or prior to the VDP
8 > Maintain at or above all step-down fixes and the MDA until the MAP
9 > After capturing the MDA, set the altitude preselect to the MAP altitude
10 > When the runway environment is in sight – and a normal descent to landing can be made – resume a descent for the landing runway
11 > Execute a missed approach procedure whenever below the MDA and the runway environment is not in sight, a normal approach to landing cannot be made, or at the MAP

Notes:

This procedure may be modified to comply with ATC requests within the aircraft and pilot's capabilities


NON-PRECISION APPROACH PROFILE—PA44
Flaps 25°
Propeller High RPM
Before Landing
Checklist
1 NM to FAF
100 KIAS
FAF
MDA
Set Missed Approach
Altitude
VAPP
MAP
Missed Approach


NON-PRECISION APPROACH CALLOUTS—PA44
Course Alive
Final Approach
FAF
100 to Minimums
Approach Lights, Continue
Minimums, Continuing
100ft. Above MDA
MDA
Runway in Sight, Landing
Missed Approach Point, Go-Around
MAP

SINGLE-ENGINE PRECISION APPROACH

References:
Instrument Flying Handbook, POH PA-44-180, Instrument ACS

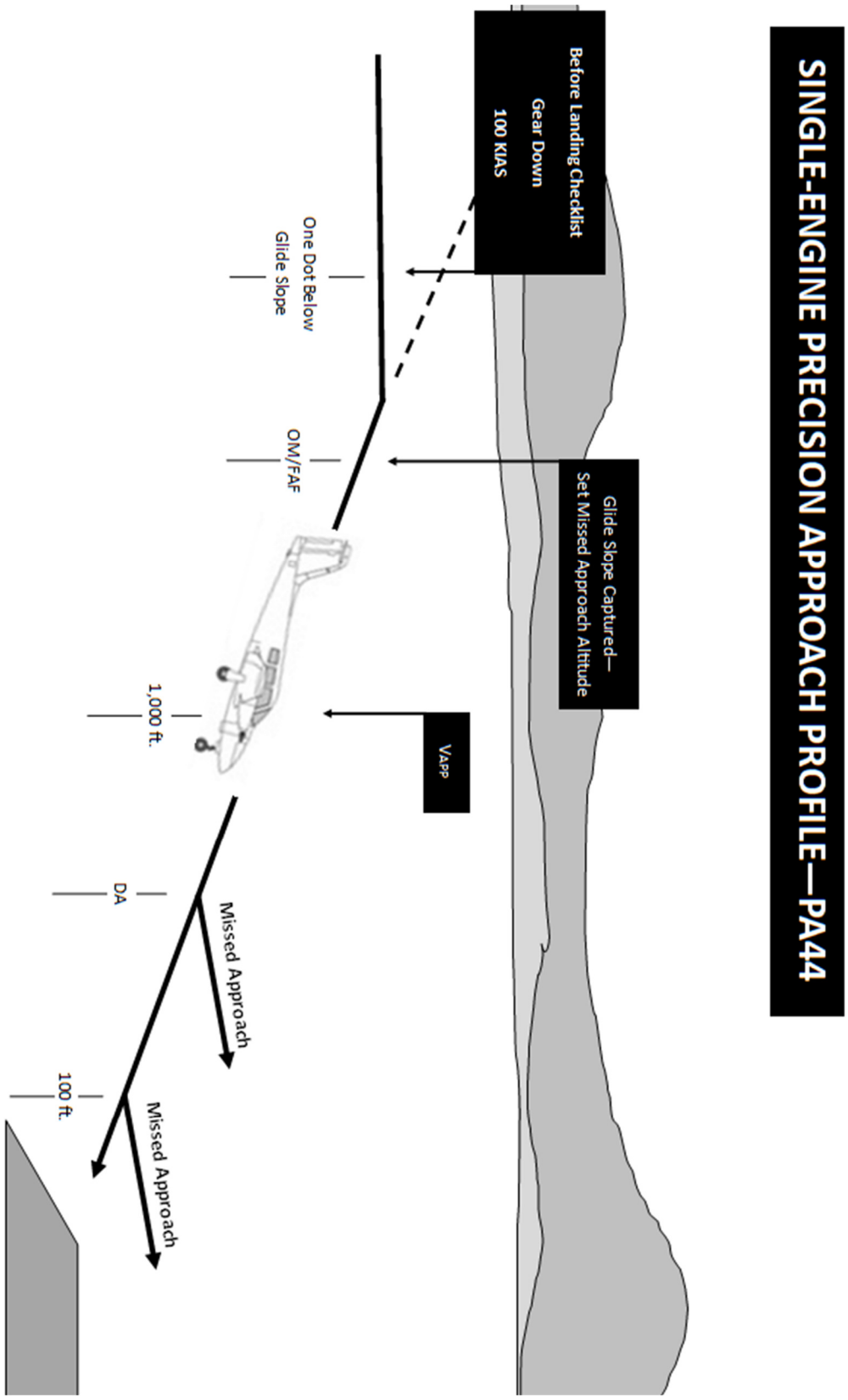
Description:
The aircraft is maneuvered to intercept the Glide Slope/Path of an ILS/LPV approach, and then descend to the DA using the Glide Slope/Path and localizer/course with one engine inoperative

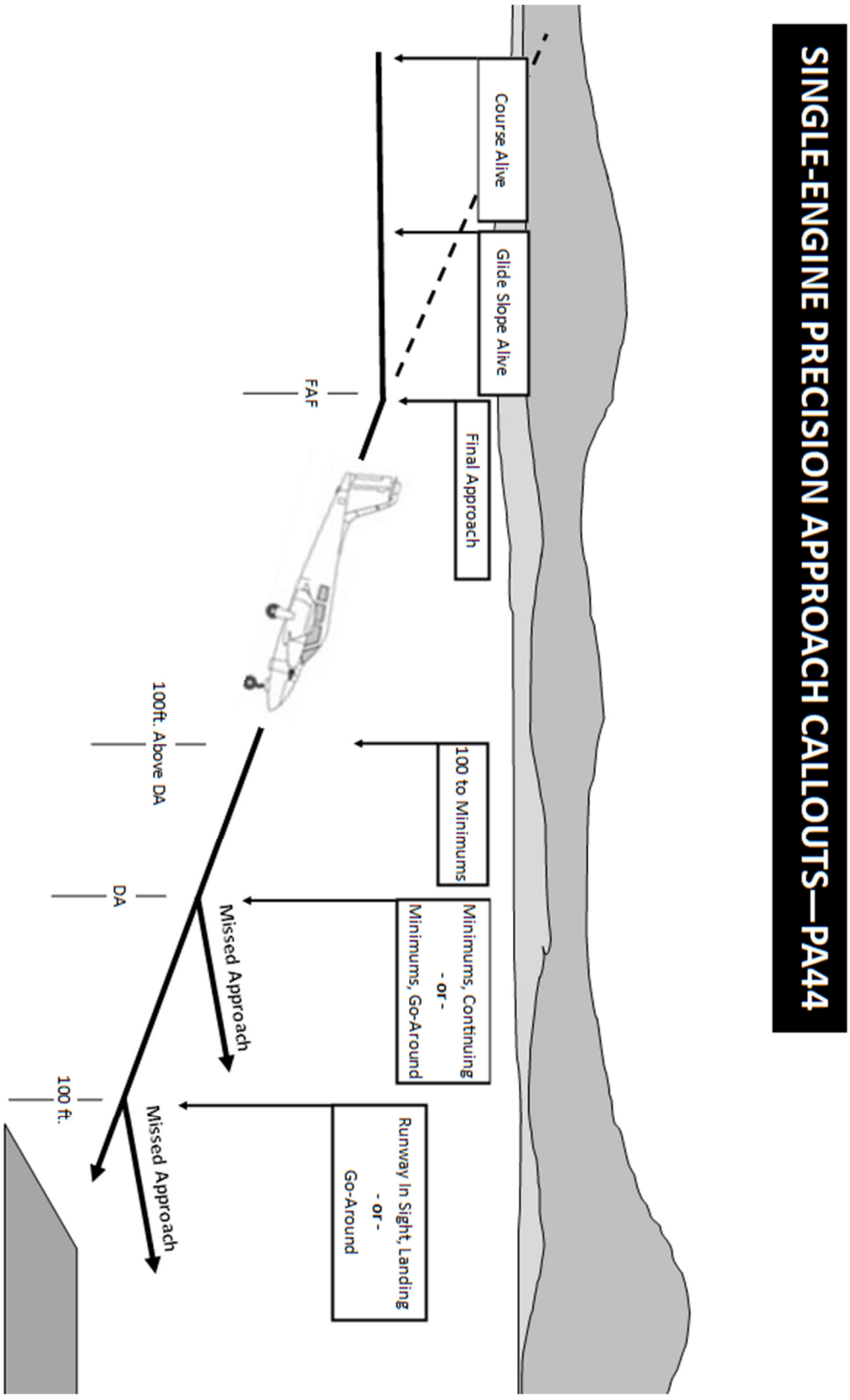
Objective:
To develop the pilot's ability to safely execute ILS and LPV approaches with one engine inoperative

Procedure:
1 > As soon as practical, obtain the ATIS or local weather
2 > Once the appropriate approach has been determined, the pilot will setup, review, and brief the procedure
3 > When established inbound, reset the OBS to the inbound course
4 > Accomplish the before landing checklist
5 > Configure with landing gear down at 100 KIAS when one dot below the Glide Slope / Path (if attainable)
6 > At Glide Slope / Path intercept, begin descent while tracking the GS/GP to the decision altitude
7 > Set the altitude preselect to the MAP altitude
8 > Ensure a stabilized approach by 1000 above TDZE
9 > Execute a missed approach procedure whenever the runway environment is not in sight or a normal approach to landing cannot be made at the DA

Notes:
This procedure may be modified to comply with ATC requests within the aircraft and pilot's capabilities

Single-engine operations do not permit flaps beyond 25 degrees. Density altitude and circling maneuvers may require modifying gear and flap schedules.


SINGLE-ENGINE PRECISION APPROACH PROFILE—PA44
Before Landing Checklist
Gear Down
100 KIAS
One Dot Below
Glide Slope
OM/FAF
Glide Slope Captured—
Set Missed Approach Altitude
1,000 ft.
VAPP
DA
Missed Approach
100 ft.
Missed Approach


SINGLE-ENGINE PRECISION APPROACH CALLOUTS—PA44
Course Alive
Glide Slope Alive
Final Approach
FAF
100 to Minimums
Minimums, Continuing
- or -
Minimums, Go-Around
Runway In Sight, Landing
- or -
Go-Around
100ft. Above DA
DA
100 ft.
Missed Approach
Missed Approach

SINGLE-ENGINE NON-PRECISION APPROACH

References:

Instrument Flying Handbook, POH PA-44-180, Instrument ACS

Description:

The aircraft is maneuvered to the final approach fix where a descent begins to the MDA with one engine inoperative. Types of non-precision approaches include: VOR, Localizer, Localizer Back Course, GPS, LDA, and SDF

Objective:

To develop the pilot's ability to safely execute non-precision approaches with one engine inoperative

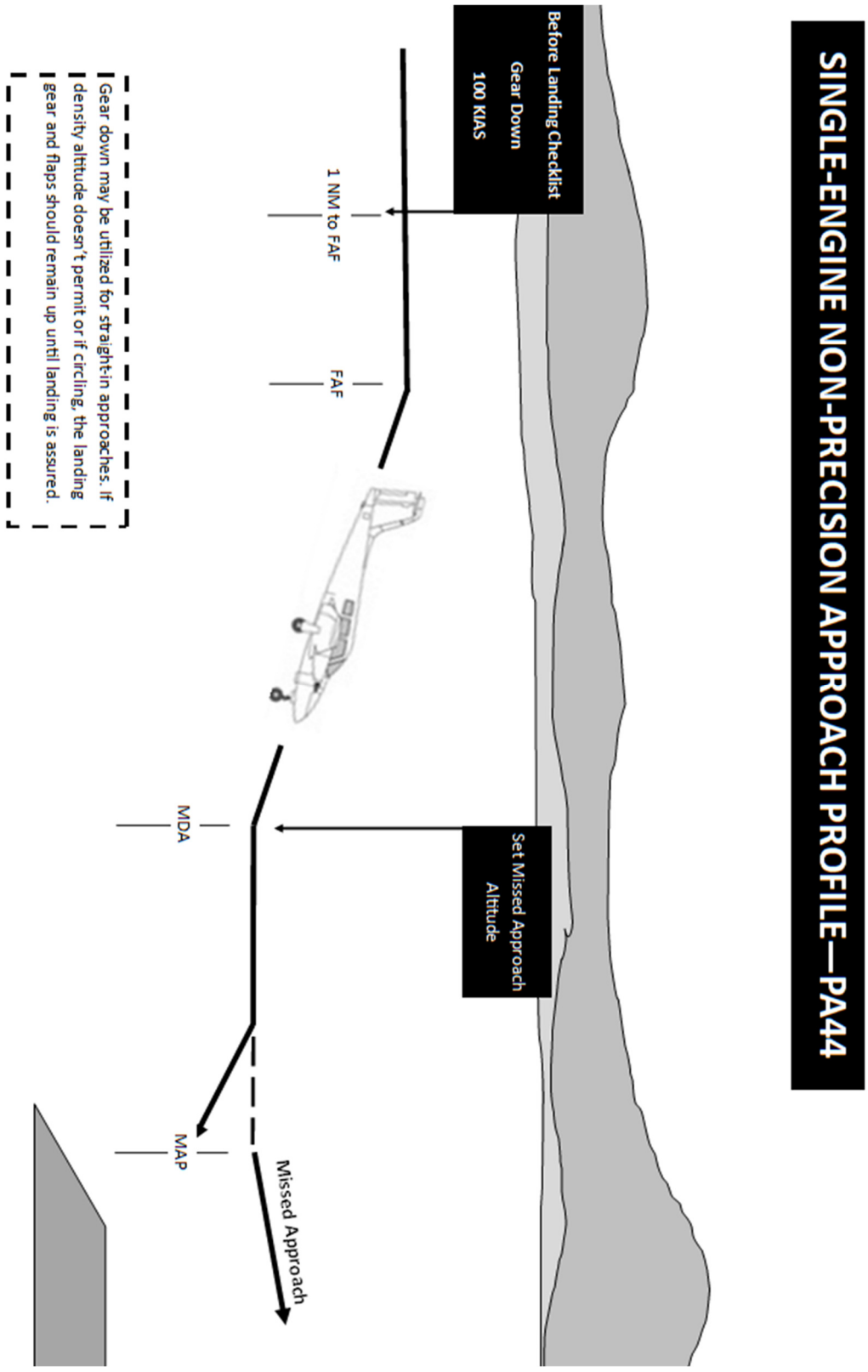
Procedure:

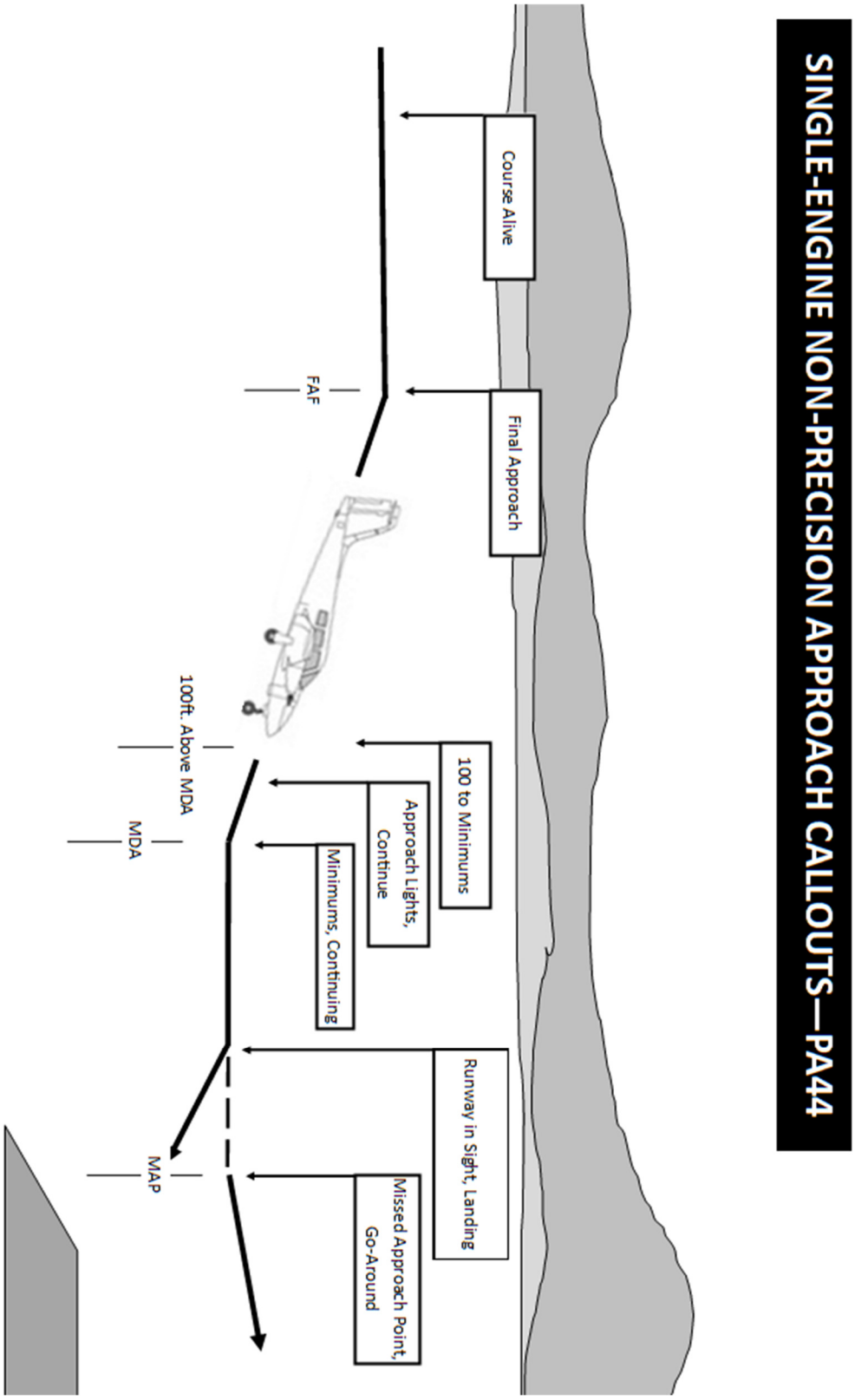
1 > As soon as practical, obtain the ATIS or local weather
2 > Once the appropriate approach has been determined, the pilot will setup, review, and brief the procedure
3 > When established inbound, reset the OBS to the inbound course
4 > Accomplish the before landing checklist
5 > Configure with landing gear down at 100 KIAS by 1 NM prior to the FAF (if attainable)
6 > At the FAF, begin time (if required to identify the MAP)
7 > After crossing the FAF, begin the descent to reach the MDA at or prior to the VDP
8 > Maintain at or above all step-down fixes and the MDA until the MAP
9 > After capturing the MDA, set the altitude preselect to the MAP altitude
10 > When the runway environment is in sight – and a normal descent to landing can be made – resume a descent for the landing runway
11 > Execute a missed approach procedure whenever below the MDA and the runway environment is not in sight, a normal approach to landing cannot be made, or at the MAP

Notes:

This procedure may be modified to comply with ATC requests within the aircraft and pilot's capabilities

Single-engine operations do not permit flaps beyond 25 degrees. Density altitude and circling maneuvers may require modifying gear and flap schedules.


SINGLE-ENGINE NON-PRECISION APPROACH PROFILE—PA44
Before Landing Checklist
Gear Down
100 KIAS
1 NM to FAF
FAF
Gear down may be utilized for straight-in approaches. If density altitude doesn't permit or if circling, the landing gear and flaps should remain up until landing is assured.
MDA
Set Missed Approach Altitude
MAP
Missed Approach


SINGLE-ENGINE NON-PRECISION APPROACH CALLOUTS—PA44
Course Alive
Final Approach
FAF
100 to Minimums
Approach Lights, Continue
Minimums, Continuing
100ft. Above MDA
MDA
Runway in Sight, Landing
Missed Approach Point, Go-Around
MAP

APPENDIX A

The evaluator/instructor must select an entry altitude that will allow the single-engine demonstration Tasks to be completed no lower than 3,000 feet AGL. If it is not possible to unfeather the propeller or restart the engine while airborne, the applicant and the evaluator/instructor should treat the situation as an emergency. At altitudes lower than 3,000 feet AGL, engine failure should be simulated by reducing throttle to idle and then establishing zero thrust. *(FAA-S-ACS-7A Commercial ACS)*

The Piper Seminole G1000 Information Manual provides the following "zero thrust" settings:

Propeller RPM for Zero Thrust

82 Vsse……1850 RPM

88 Vyse……2180 RPM

100……2510 RPM

110……2690 RPM

Engine failure (simulated) during takeoff should be accomplished prior to reaching 50 percent of the calculated VMC.