



PIPER PA-28 161/151

Standard Operating Procedures



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A-Z





DEFINITIONS

Flags: Any annunciator lights, sign of a malfunction, concern, red X's, instrument Loss of Integrity, mechanical problems etc...

Gust factor: The value in "[kt](#)" added to your approach speed in order to account for the gusts.

Profile: SOPs are also known as "profiles". Judging if you are on "profile" is judging the relative position of the airplane in relation to our SOPs.

RTB: Return To Base.

TDP: Touch Down Point.

TOD: Top Of Descent.

Vref: Reference speed chosen for the approach and landing, given current conditions.



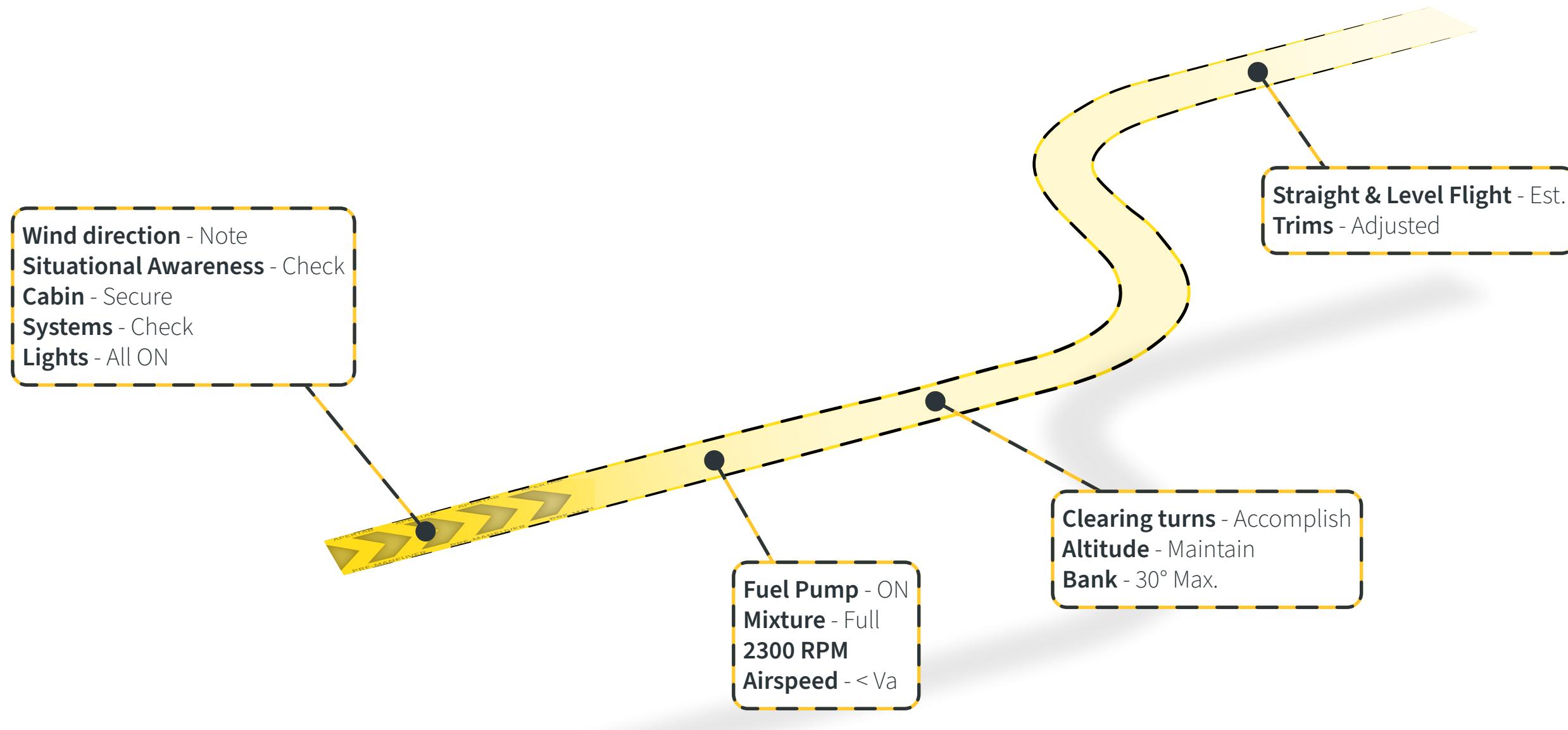


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Part I: General

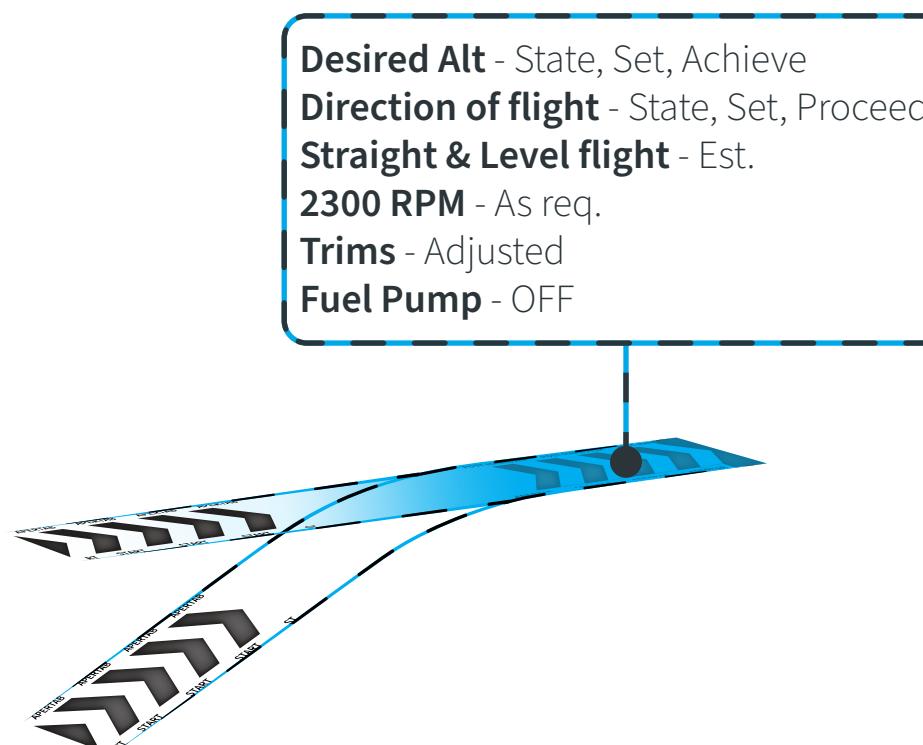


PRE MANEUVER / CLEARING TURN



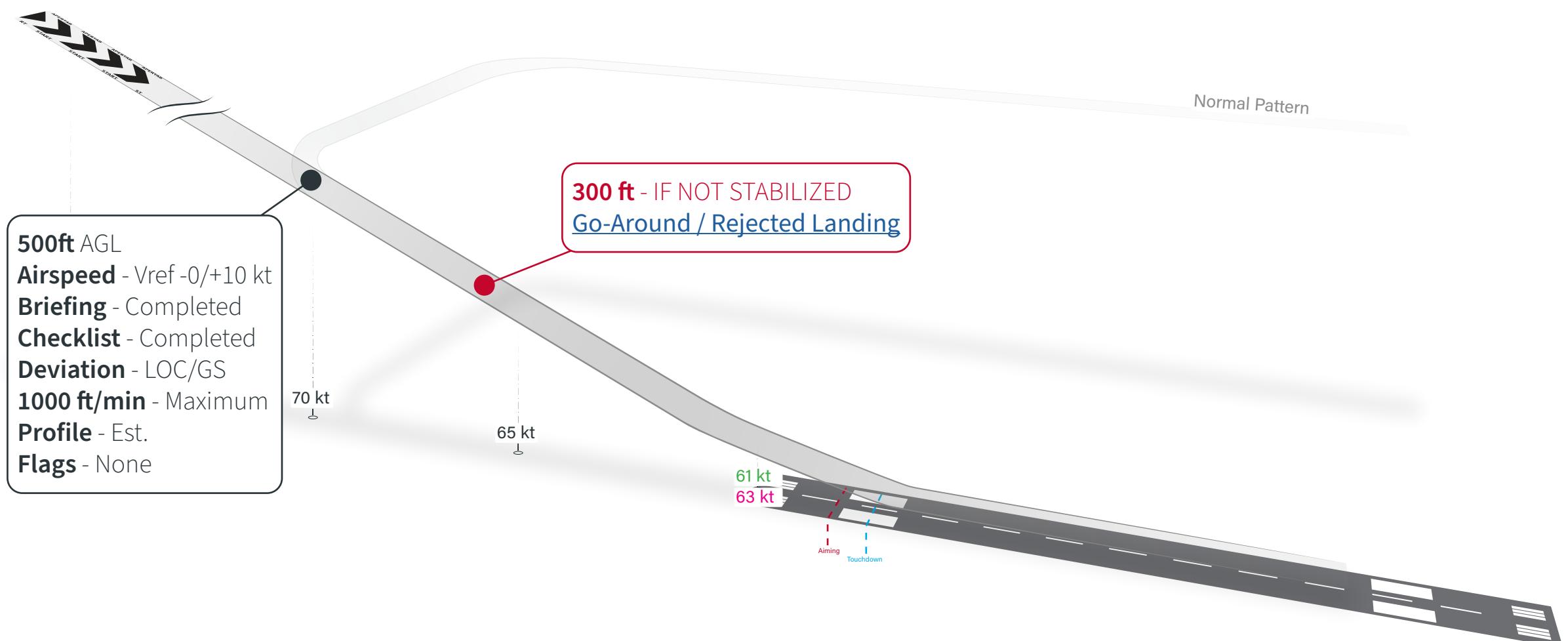


POST MANEUVER





STABILIZED APPROACH





DESCENT RULE OF THUMB

The "3 to 1" rule

Step 1: What distance from a fix do I need to start my descent?

$$\text{Dist (NM)} = (\text{Altitude to loose}) / 3$$

Scenario: You are flying a Cross Country from KSRQ to KSEF at 5,500ft. You want to overfly KSEF at 2,500ft to check for wind socks and maneuver for the correct downwind.

You have to loose 5,500ft - 2,500ft = 3,000ft

$$\text{Dist} = 3,000 / 3$$

$$\text{Dist} = 1,000 \text{ NM}$$

That is a lot of NM... remove the last two digits and see if it makes more sense?

$$\text{Dist} = 10.00 \text{ NM}$$

There you have it! You need to leave 5,500ft to 2,100ft approximately **10.00** NM away from KSEF following a **3° descent** angle.

- Proceed to Step 2 -

RPM, ft/min

Step 2: How to establish a 3° descent?

$$3^{\circ} (\text{ft/min}) = 5 \times (\text{Ground Speed})$$

Scenario: You are on a long final showing on PAPI (3°) and the GPS reads a Ground Speed of 90kt.

$$3^{\circ} (\text{ft/min}) = 5 \times 90$$

$$3^{\circ} (\text{ft/min}) = 450 \text{ ft/min}$$

To make it easy, let's round it up: **500** ft/min

There you have it! You need to maintain approximately **500** ft/min in order to keep a **3° descent** angle and therefore stay on PAPI.

- Proceed to Step 3 -

3° Descent

Step 3: How to establish a XXX ft/min descent using RPMs?

$$-X00 \text{ RPM} = -X00 \text{ ft/min}$$

Scenario: You are in downwind doing touch and goes and showing 90kt Ground Speed. Abeam touch down point you want to establish a 3° descent. You know 3° descent at 90kt is approximately 500 ft/min.

From your current 2,200 RPM you need to remove the amount of ft/min you want to loose.

$$-500 \text{ RPM} = -500 \text{ ft/min}$$

$$2,200 - 500 = 1,700 \text{ RPM}$$



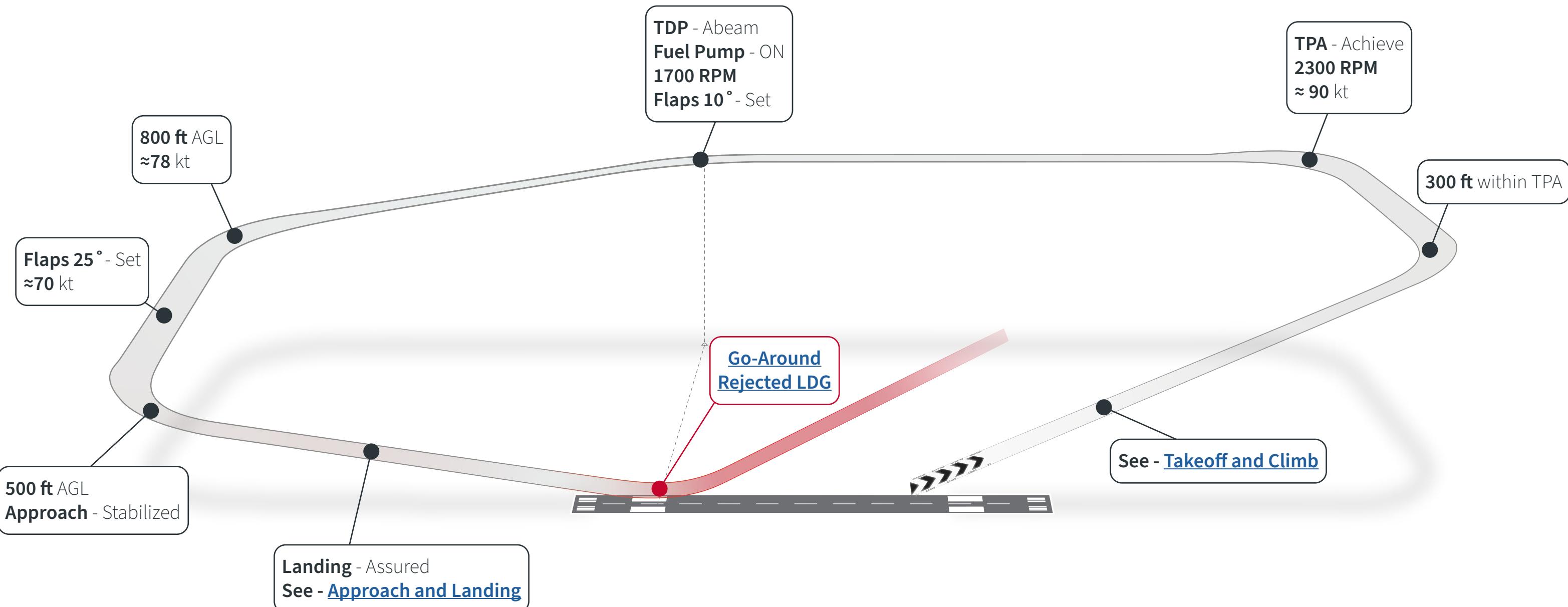


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Part II: Takeoffs & Landings



NORMAL PATTERN / GO AROUND





TAKEOFF AND CLIMB

Fuel Pump - ON
Flaps - Min req.
Throttle - Full
Engine gauges - Check
Wind direction - Note
Ailerons - Partially into wind

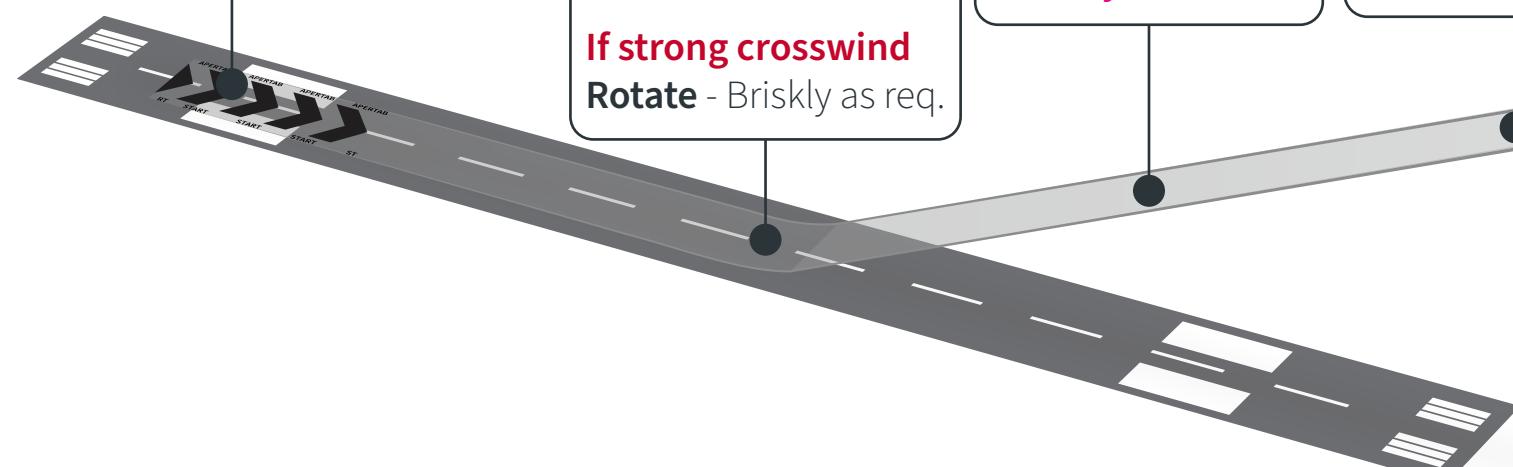
151 - $V_r > 52 \text{ kt}$
161 - $V_r > 55 \text{ kt}$
If strong crosswind
Rotate - Briskly as req.

Crab - Into wind
Pitch $7.5^\circ/10^\circ$ - Est.
151 - $V_y 76 \text{ kt}$
161 - $V_y 79 \text{ kt}$

Altitude - Per AIM
HDG turn - Execute

CRZ or TPA
Fuel Pump - OFF
87 kt

> 5,000 ft
Mixture - Lean

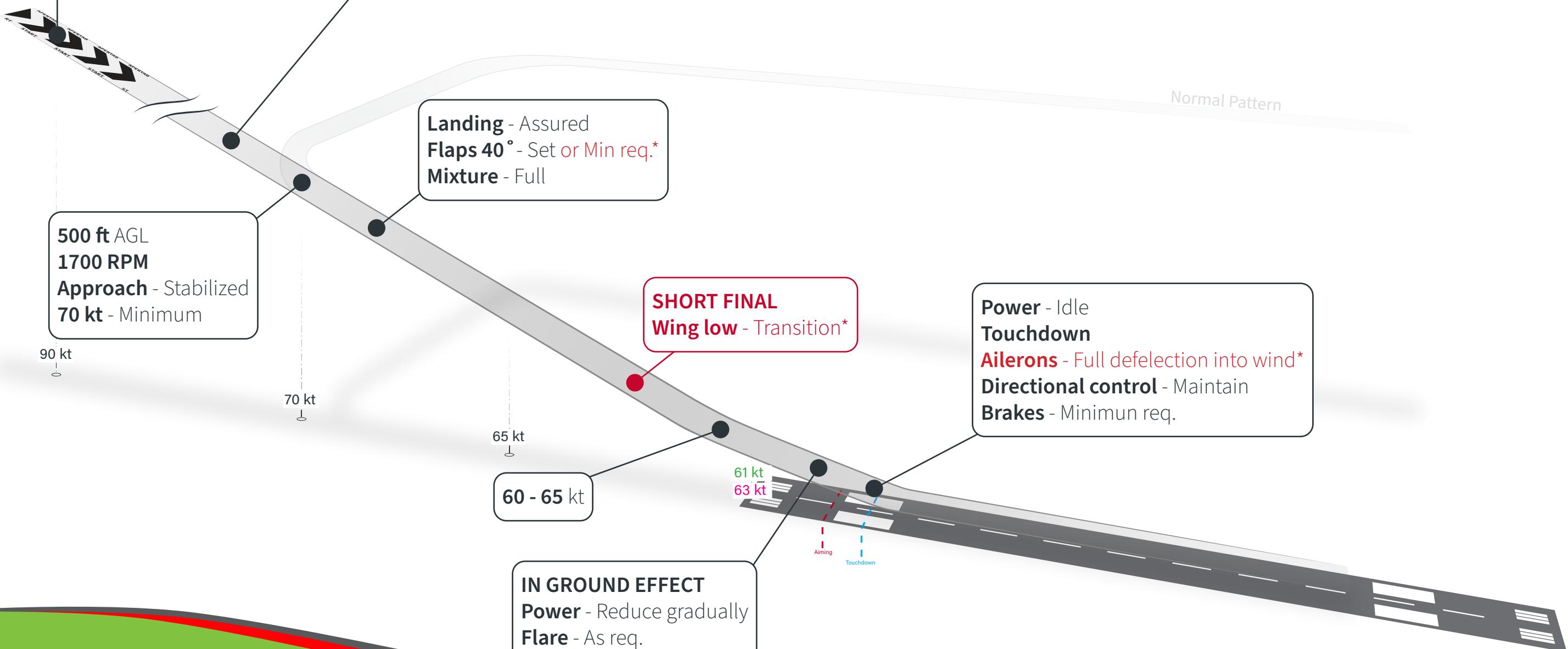




APPROACH AND LANDING

1000 ft AGL
Fuel Pump - ON
2000 RPM
Flaps 10° - Set or Min req.*
 ≈ 90 kt
Crab - Into wind*

Aiming point - Stationary
Flaps 25° - Set or Min req.*

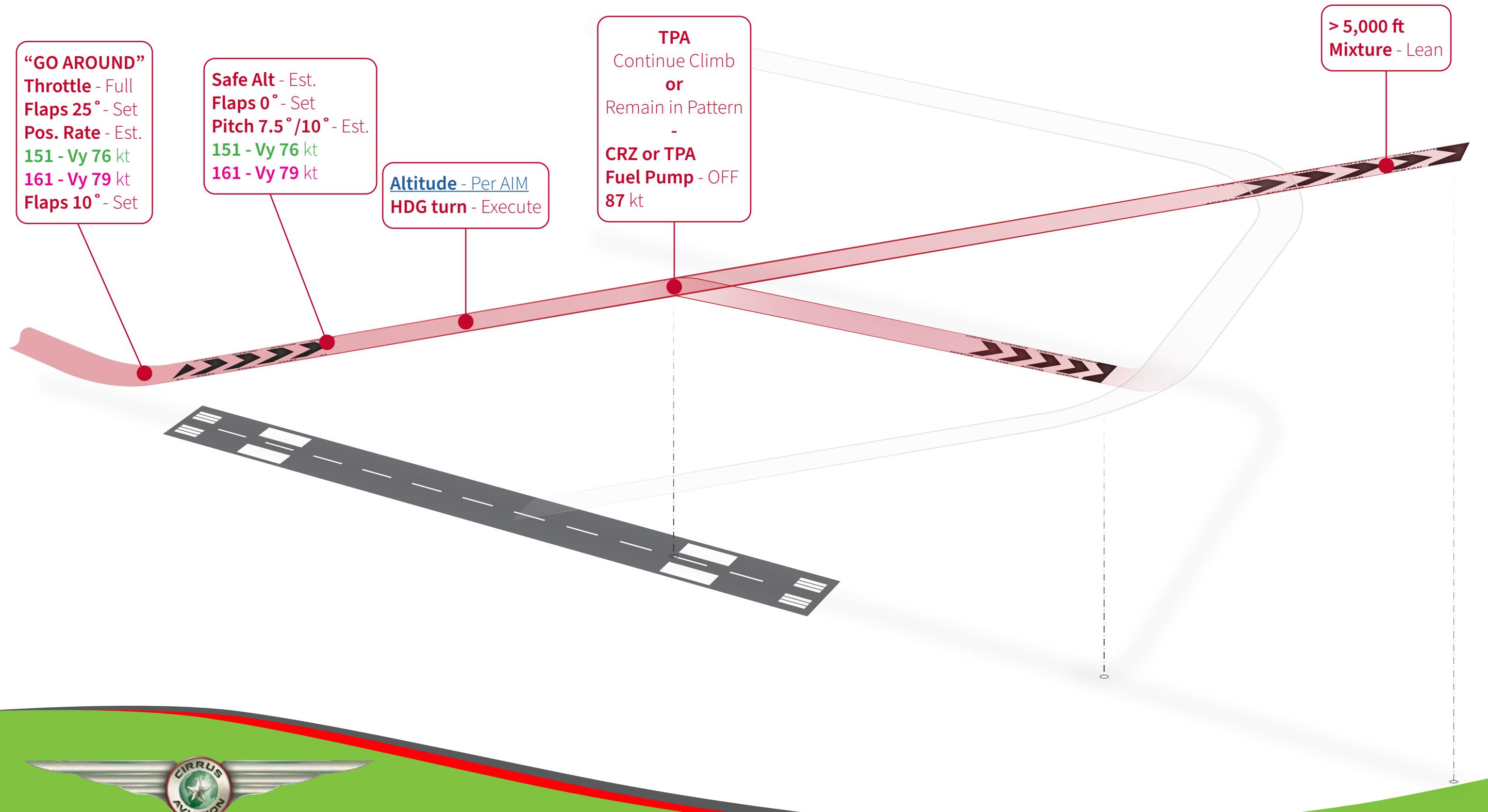


* When high cross wind or gusting conditions exist



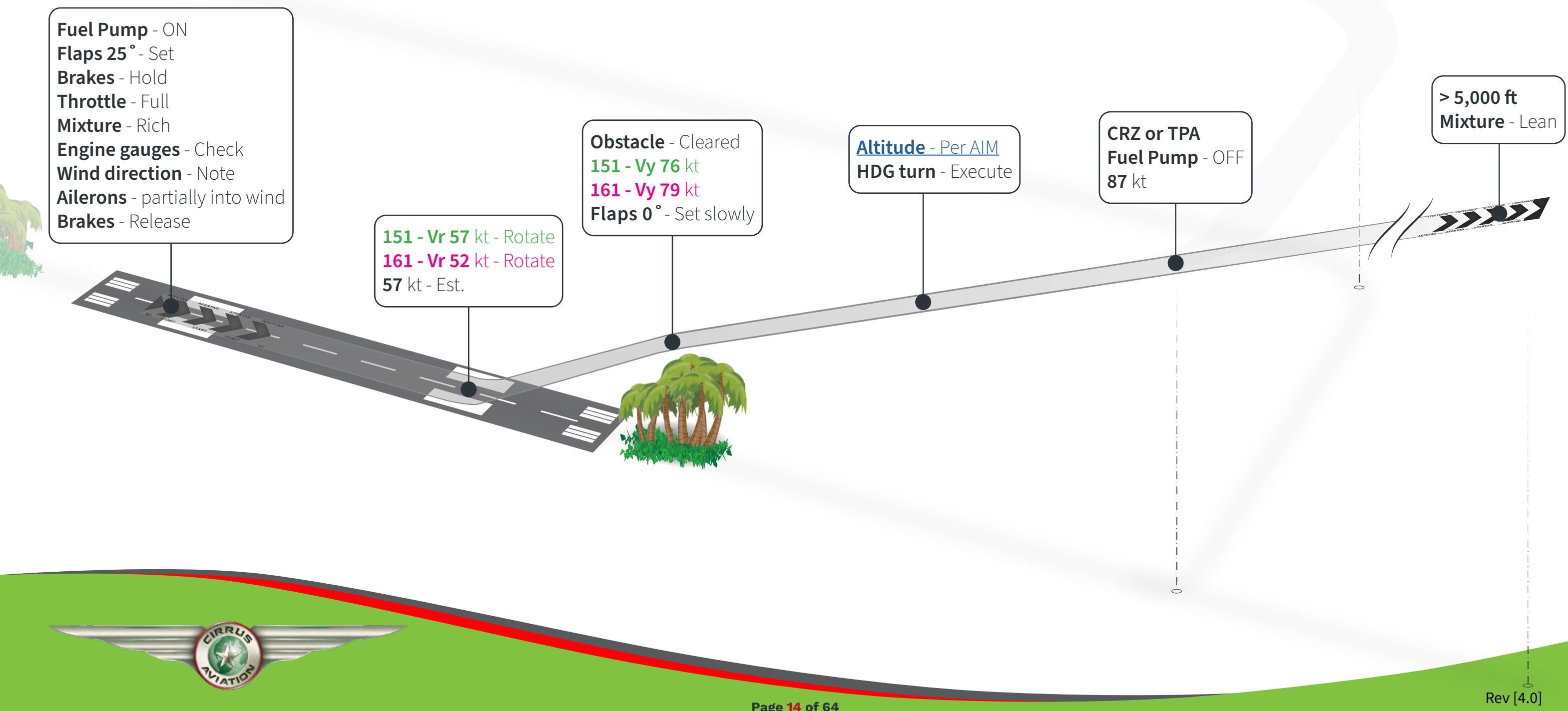


GO AROUND / REJECTED LANDING



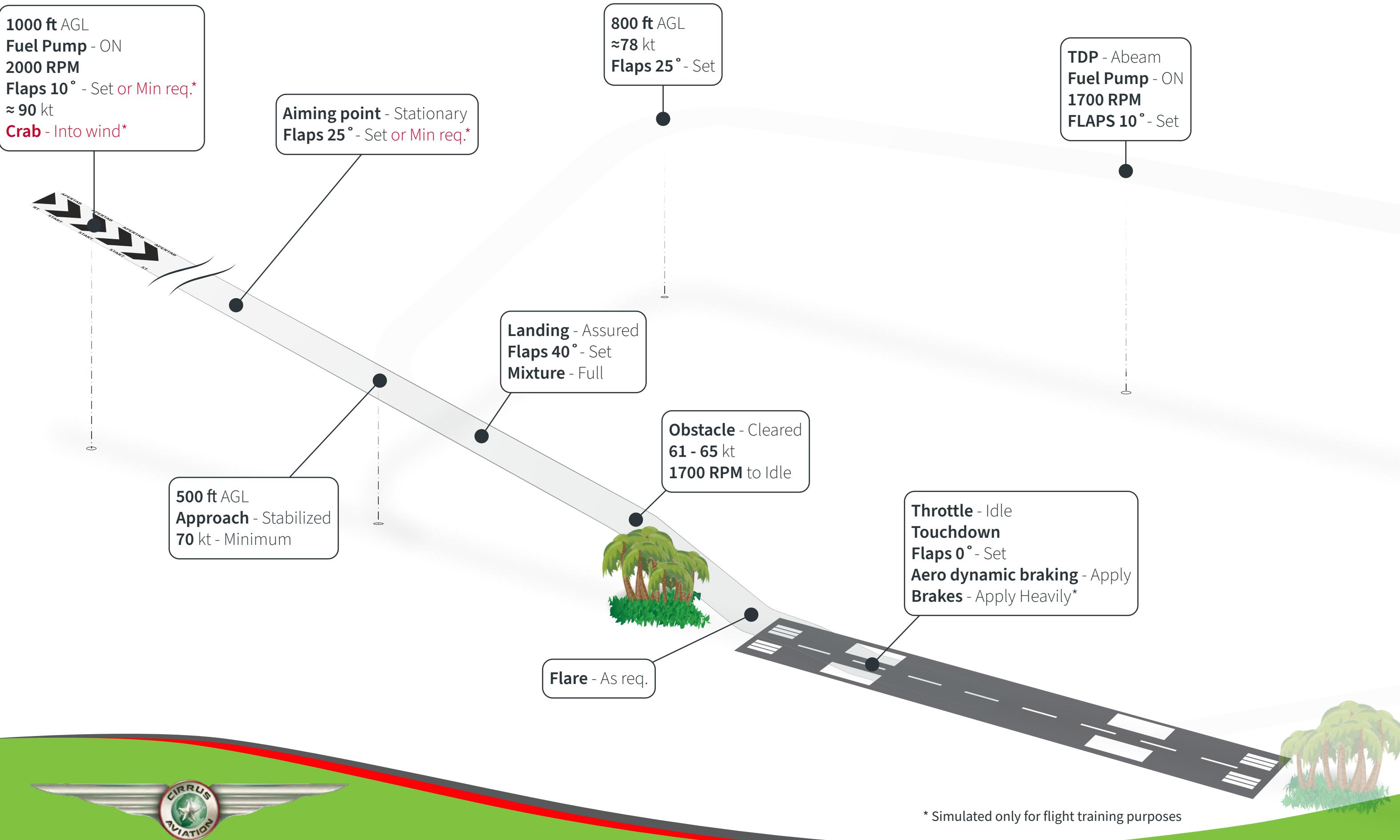


SHORT FIELD TAKEOFF AND CLIMB





SHORT FIELD APPROACH AND LANDING





SOFT FIELD TAKEOFF AND CLIMB

Fuel Pump - ON
Elevator - Full nose UP
Flaps 25° - Set
Brakes - Released
Throttle - Full smoothly
Mixture - Rich
Engine gauges - Check
Elevator - Adjust

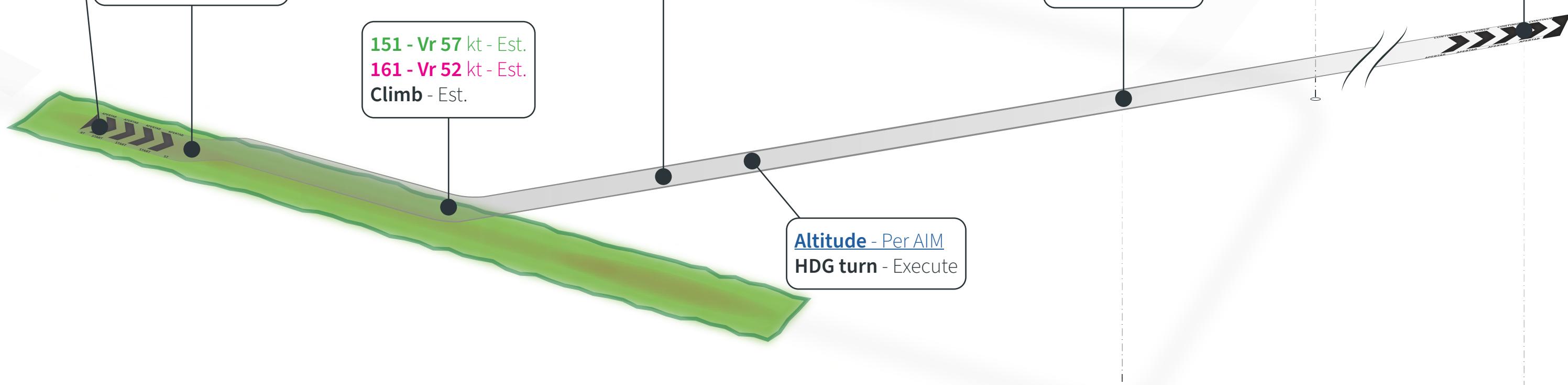
Rotate - ASAP
Gnd effect - Maintain

OUT OF GROUND EFFECT
Obstacle - Cleared (As req.)
151 - Vy 76 kt - Est.
161 - Vy 79 kt - Est.
Flaps 0° - Set slowly

151 - Vr 57 kt - Est.
161 - Vr 52 kt - Est.
Climb - Est.

CRZ or TPA
Fuel Pump - OFF
87 kt

> 5,000 ft
Mixture - Lean





SOFT FIELD APPROACH AND LANDING

1000 ft AGL

Fuel Pump - ON

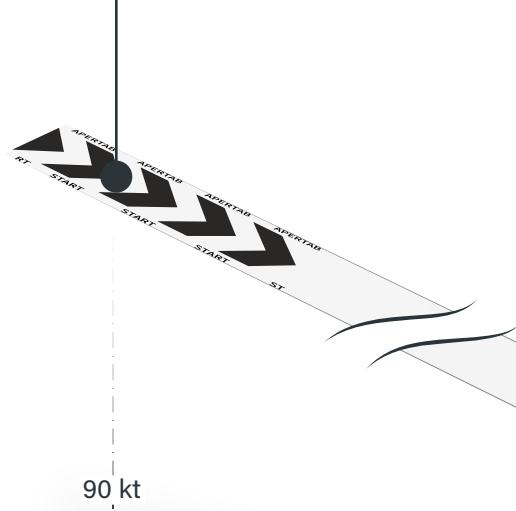
2000 RPM

Flaps 10° - Set or Min req.*

≈ 90 kt

Crab - Into wind*

Aiming point - Stationary
Flaps 25° - Set or Min req.*



500 ft AGL
1700 RPM
Approach - Stabilized
70 kt - Minimum

Landing - Assured
Flaps 40° - Set
Mixture - Full

SHORT FINAL
Wing low - Transition*

61 - 65 kt

IN GROUND EFFECT
Power - Reduce gradually
Flare - As req.

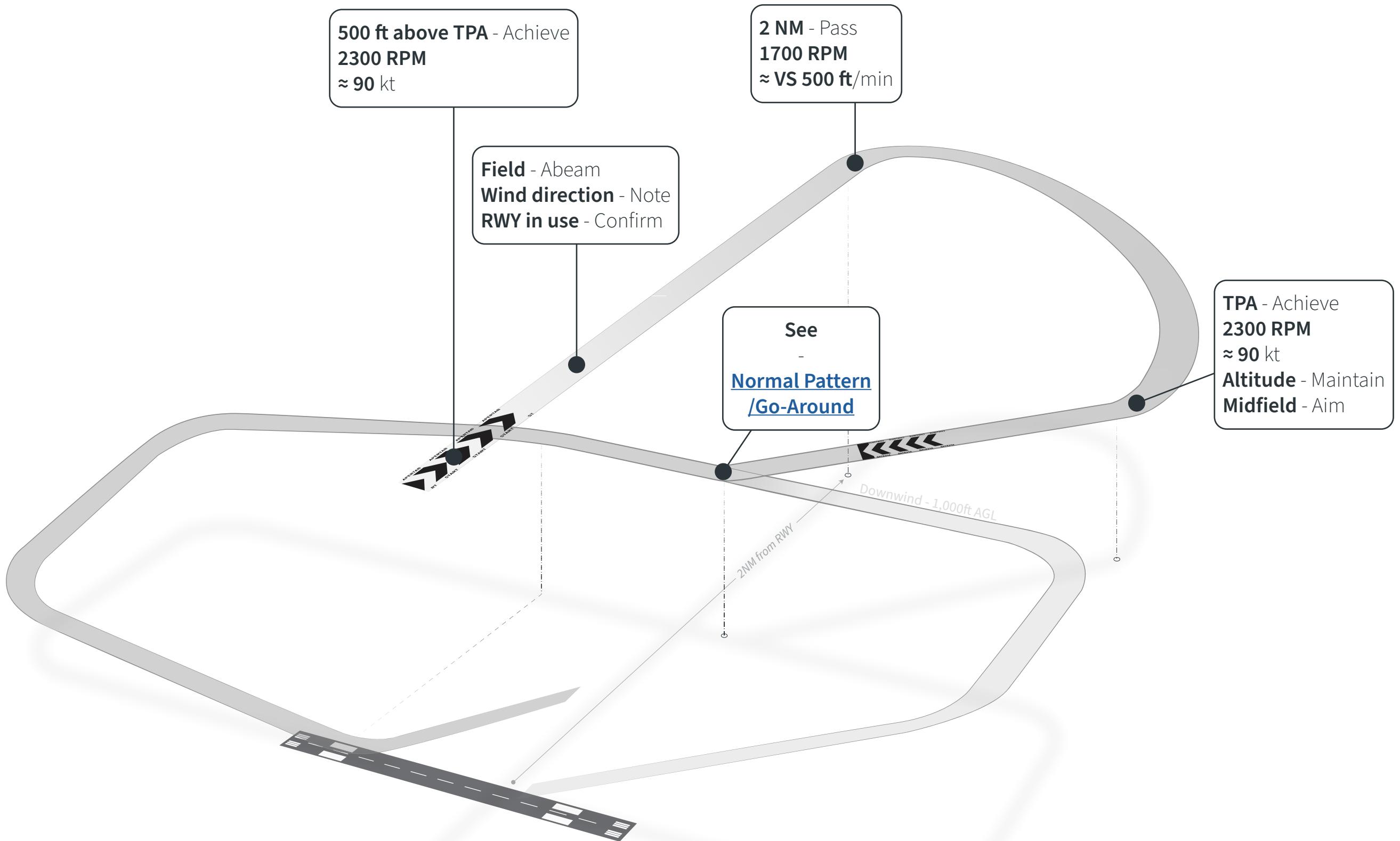
Power - Minimal
Touchdown
Ailerons - Full deflection into wind*
Directional control - Maintain
Brakes - Minimum req.
Elevator - Gradually full up



* When high cross wind or gusting conditions exist

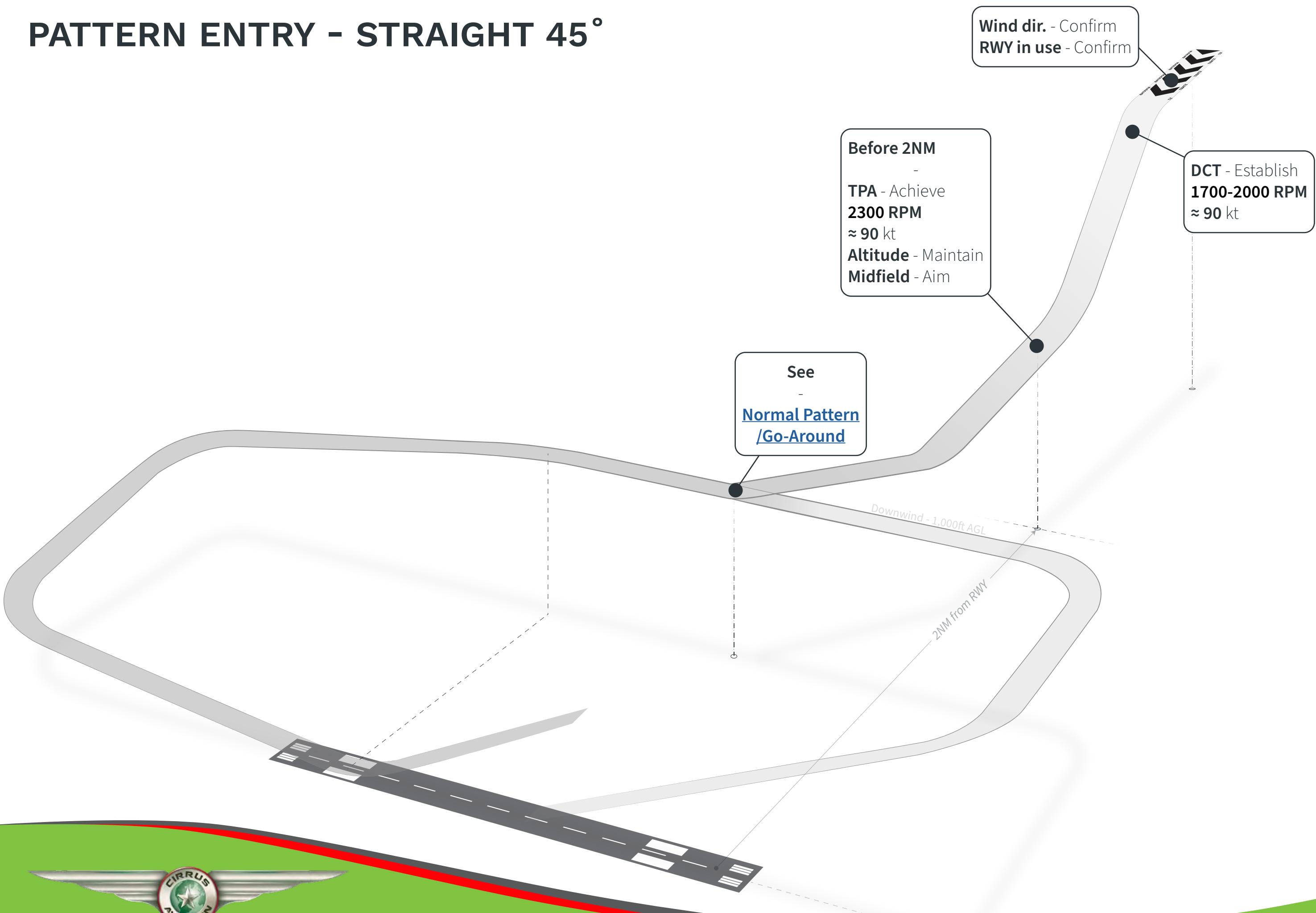


PATTERN ENTRY - TEARDROP



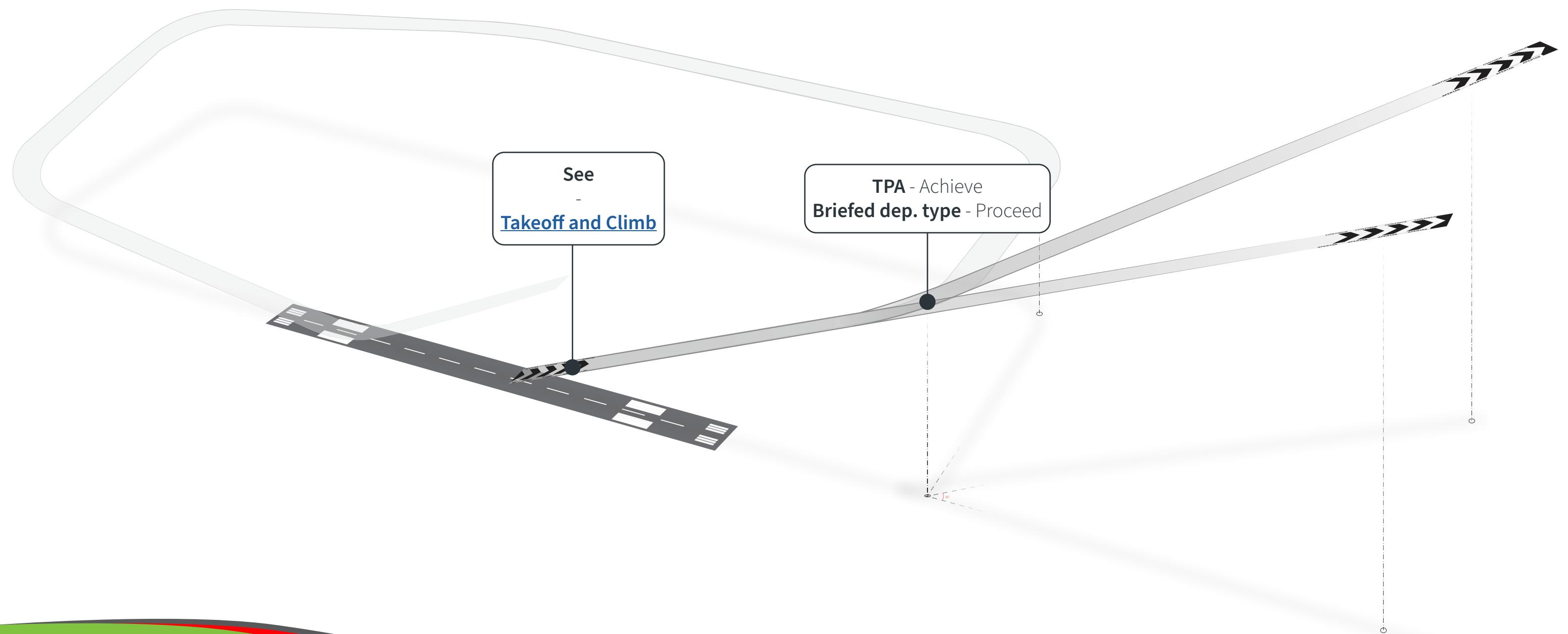


PATTERN ENTRY - STRAIGHT 45°



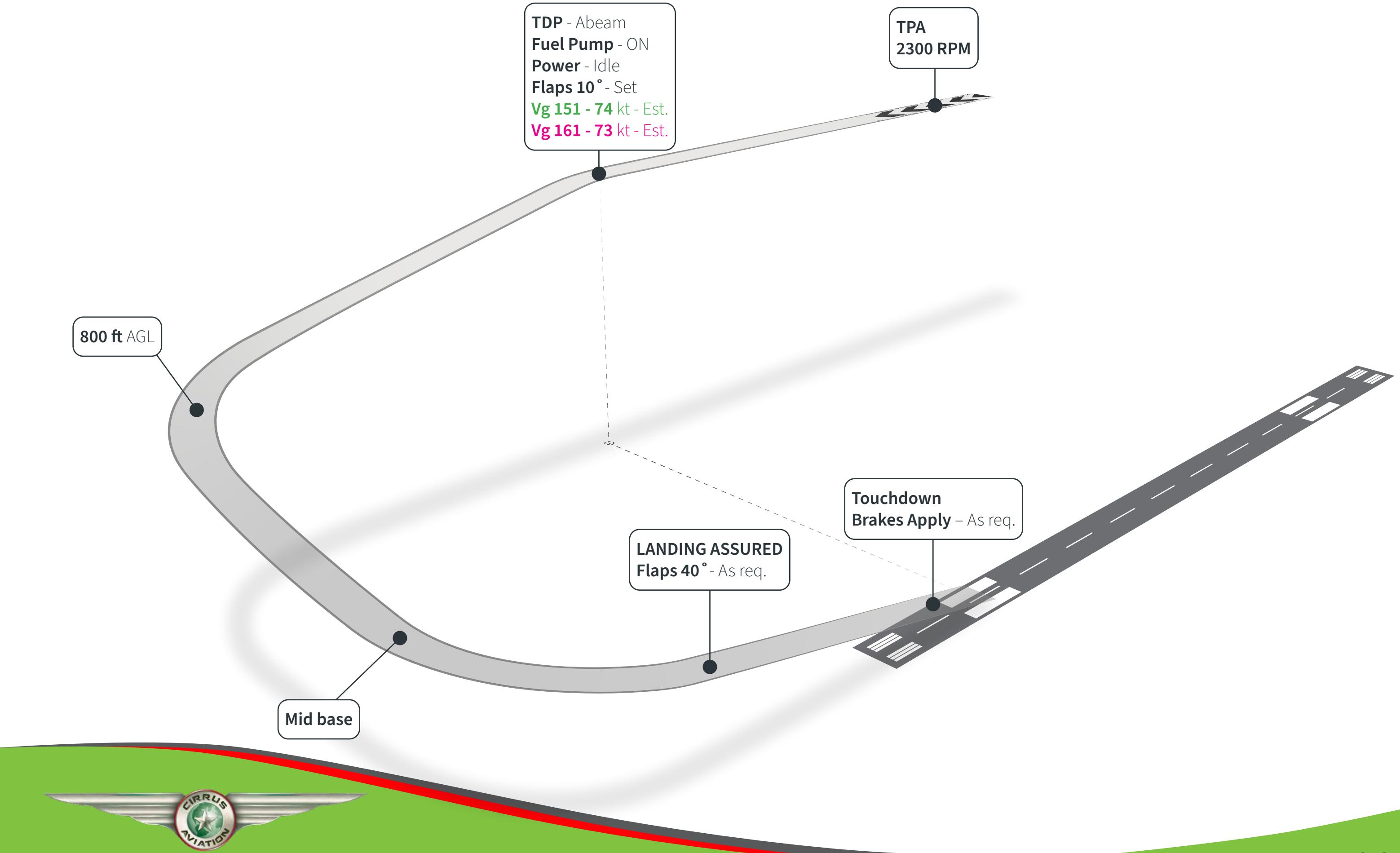


PATTERN EXIT - STRAIGHT OUT & 45°





POWER OFF 180



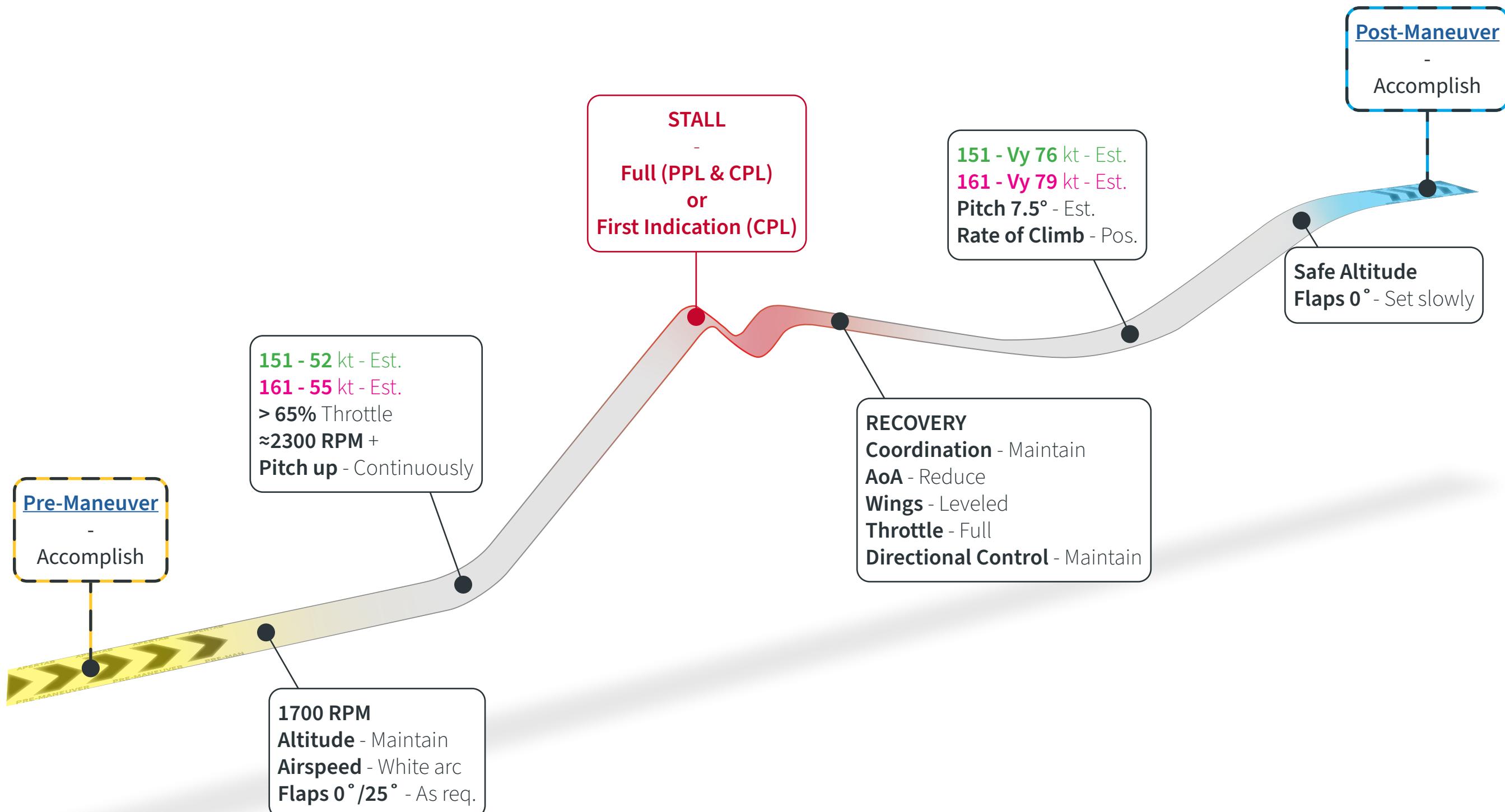


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Part III: Slow Flight and Stalls

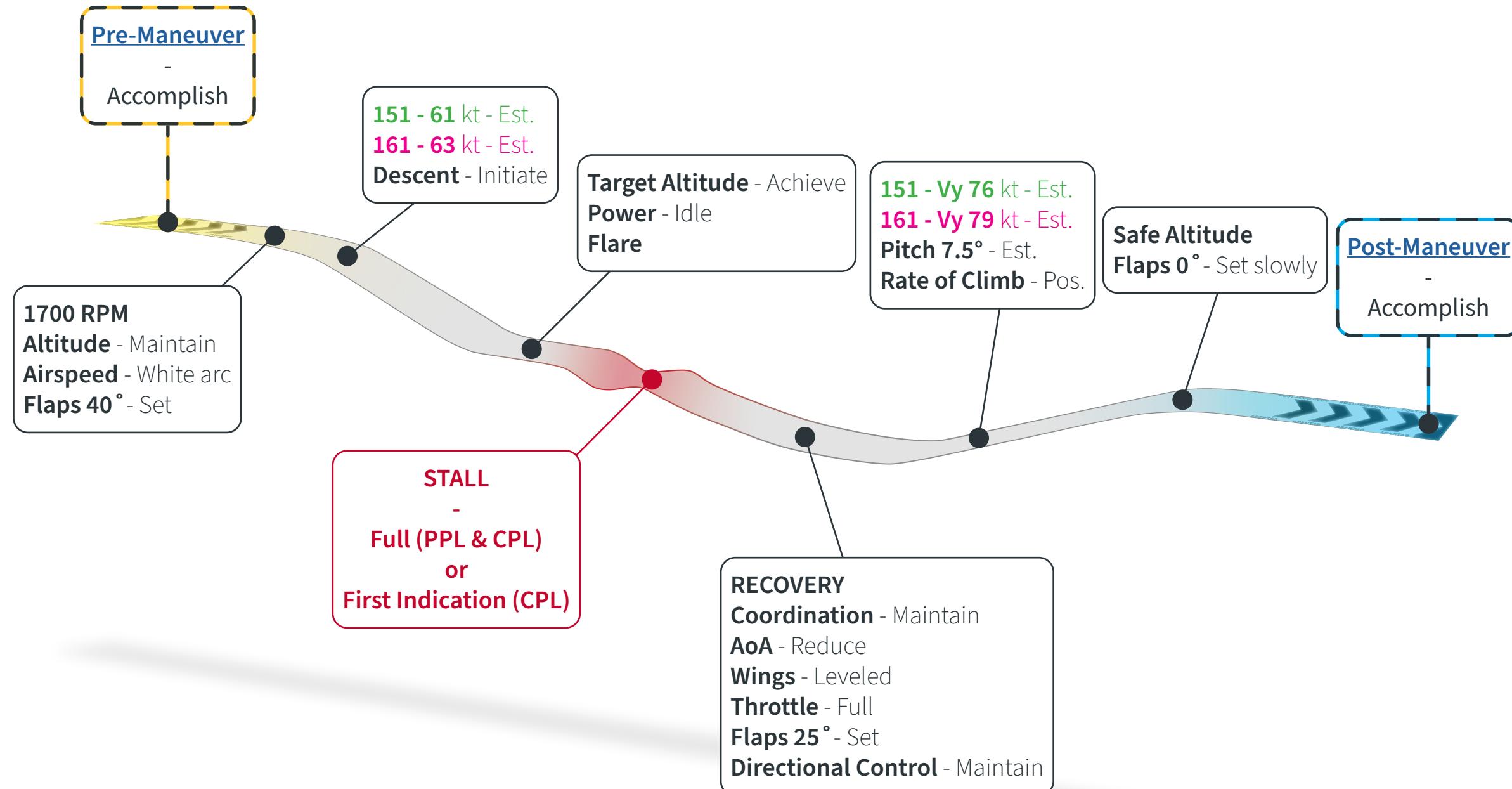


POWER ON STALL



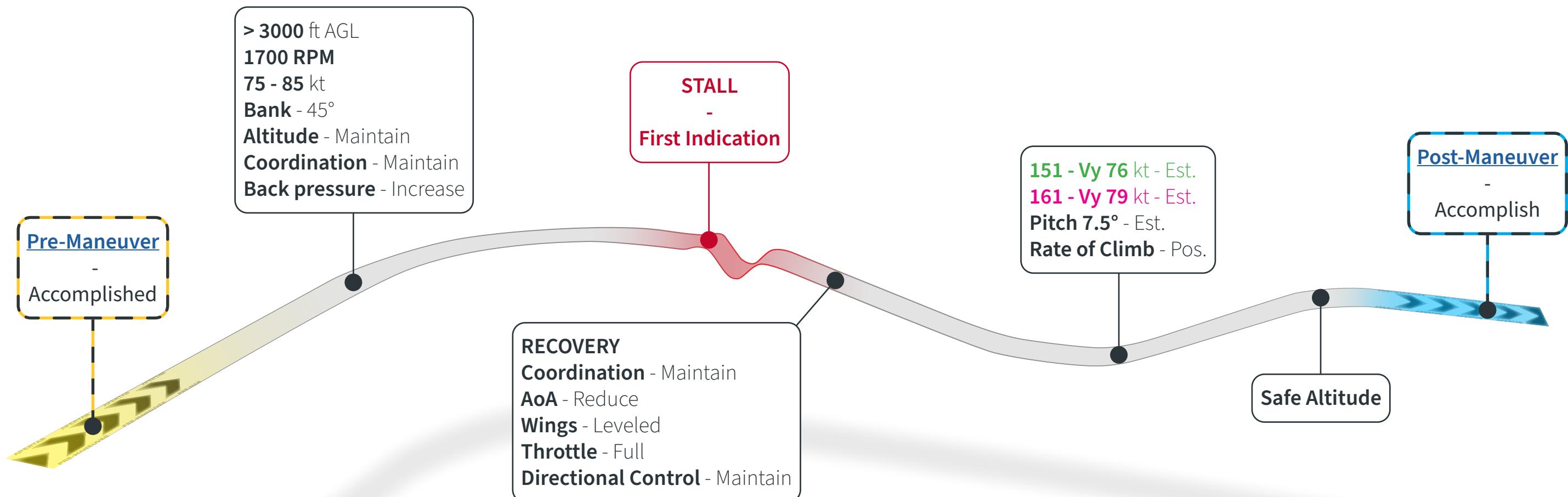


POWER OFF STALL



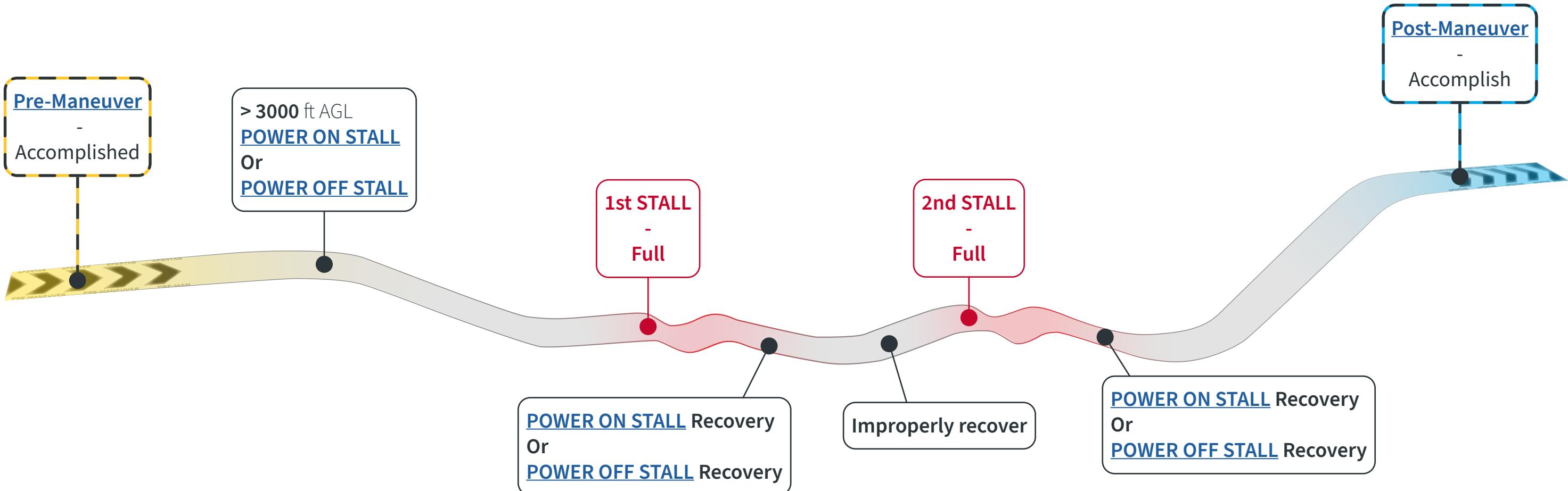


ACCELERATED STALL



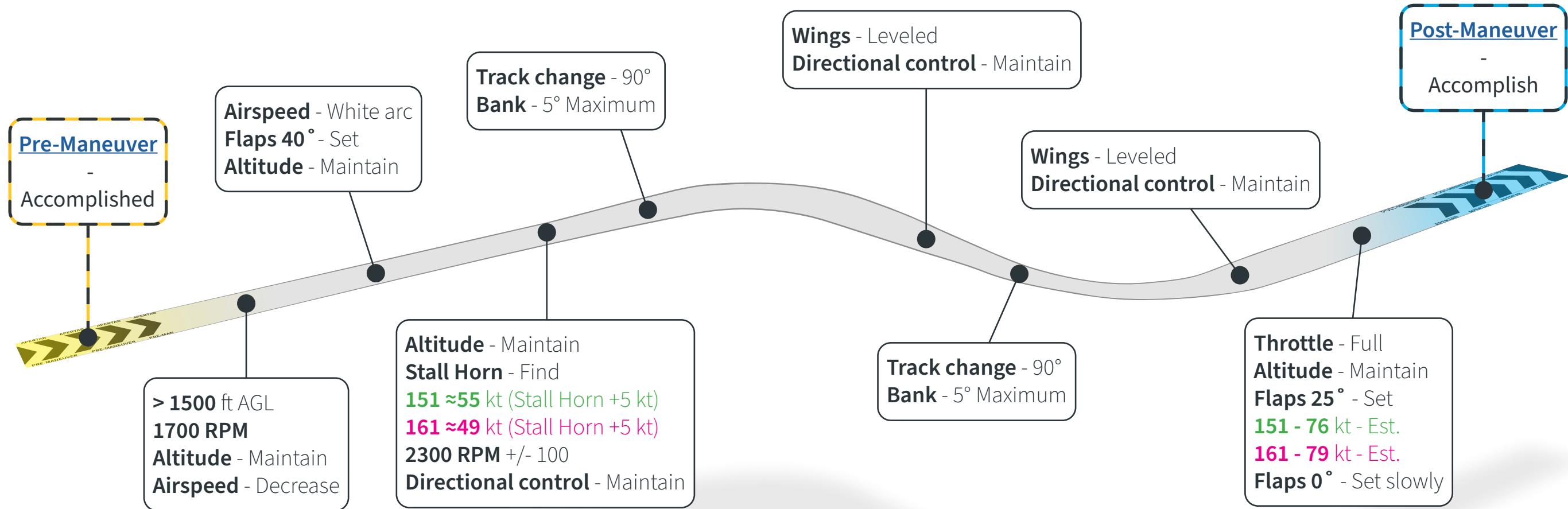


SECONDARY STALL (CFI)

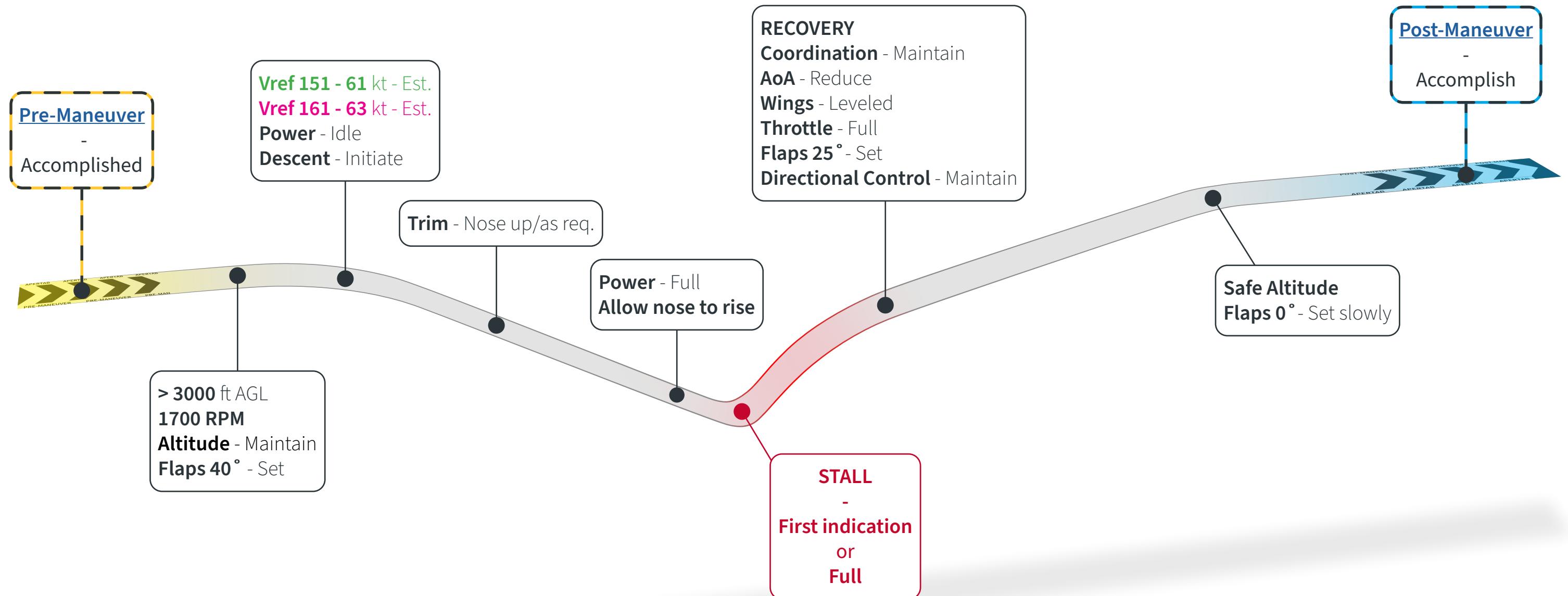




MANEUVERING DURING SLOW FLIGHT

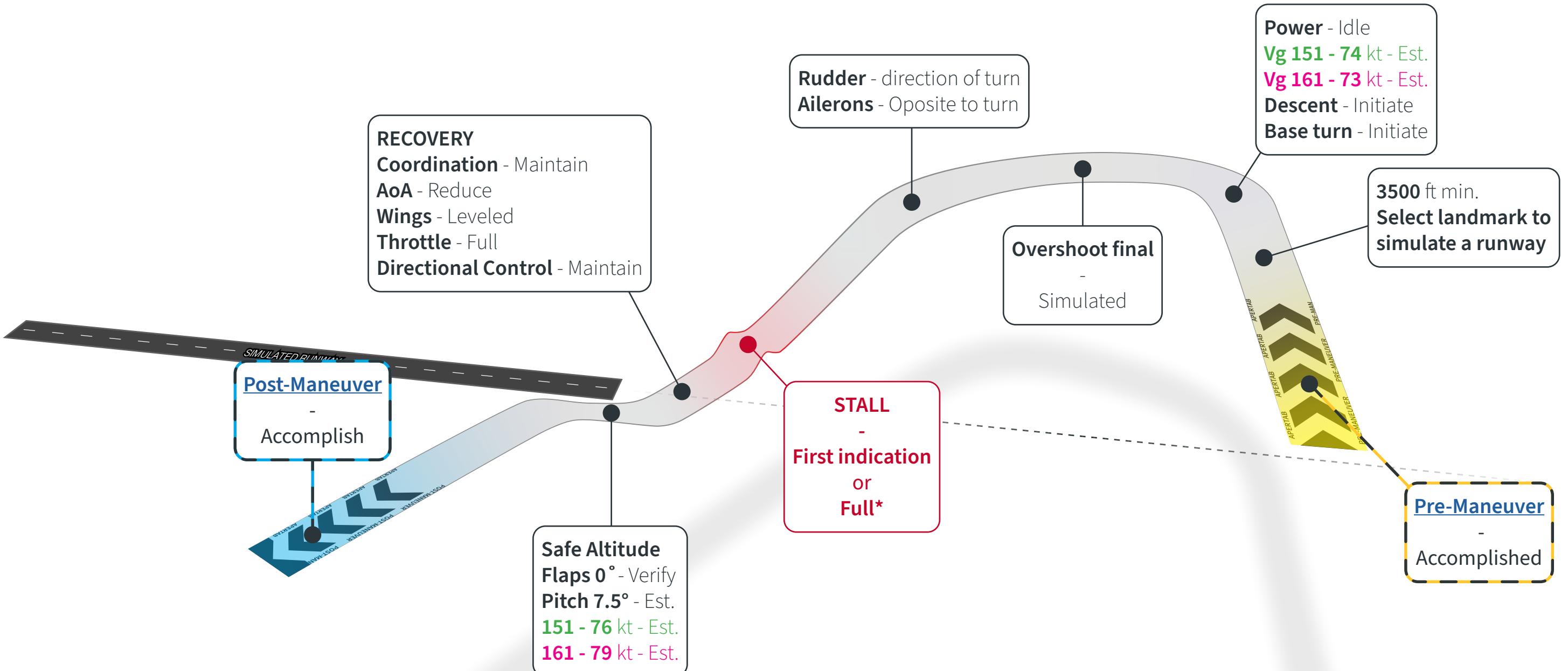


ELEVATOR TRIM STALL (CFI)





CROSS CONTROL STALL (CFI)

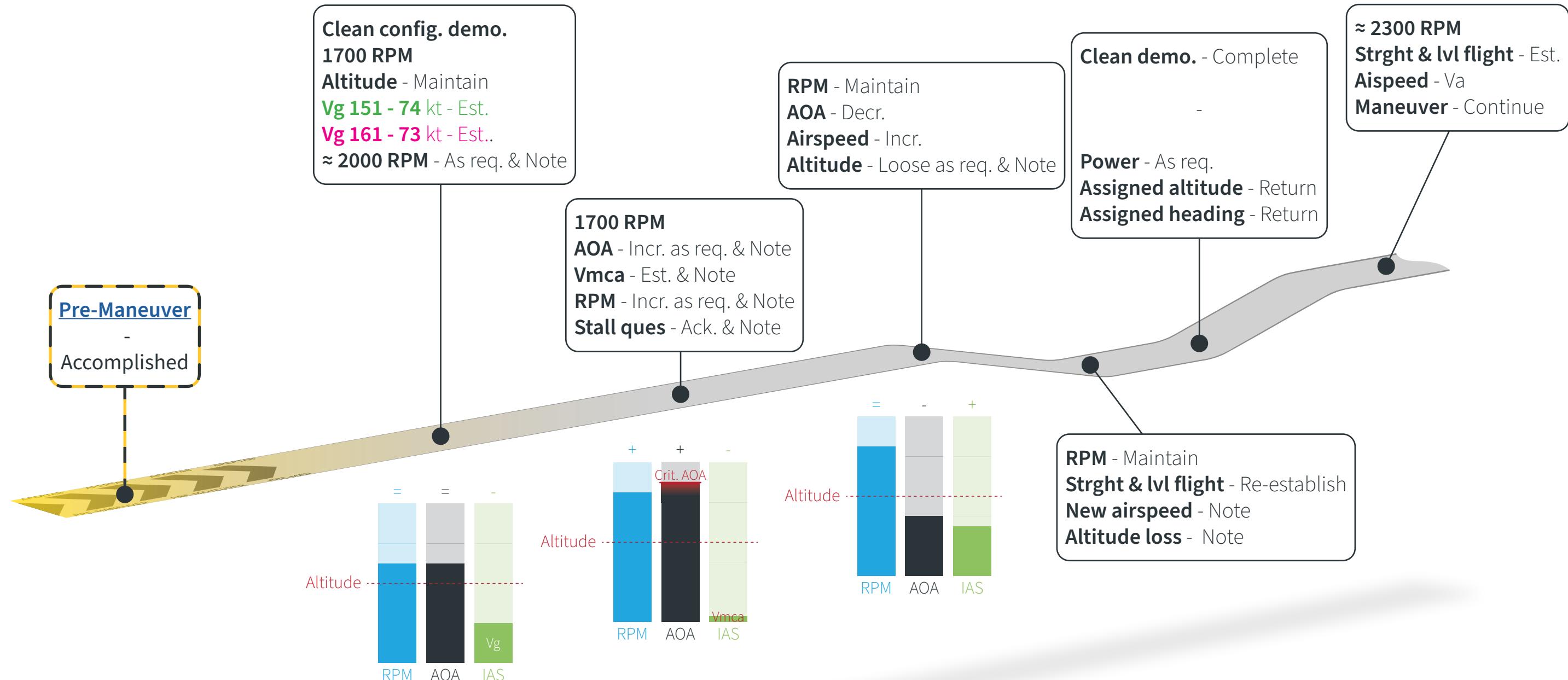


* High spin risk maneuver. Must have been briefed as part of the flight lesson on the ground. Spins are prohibited in both normal and utility categories.



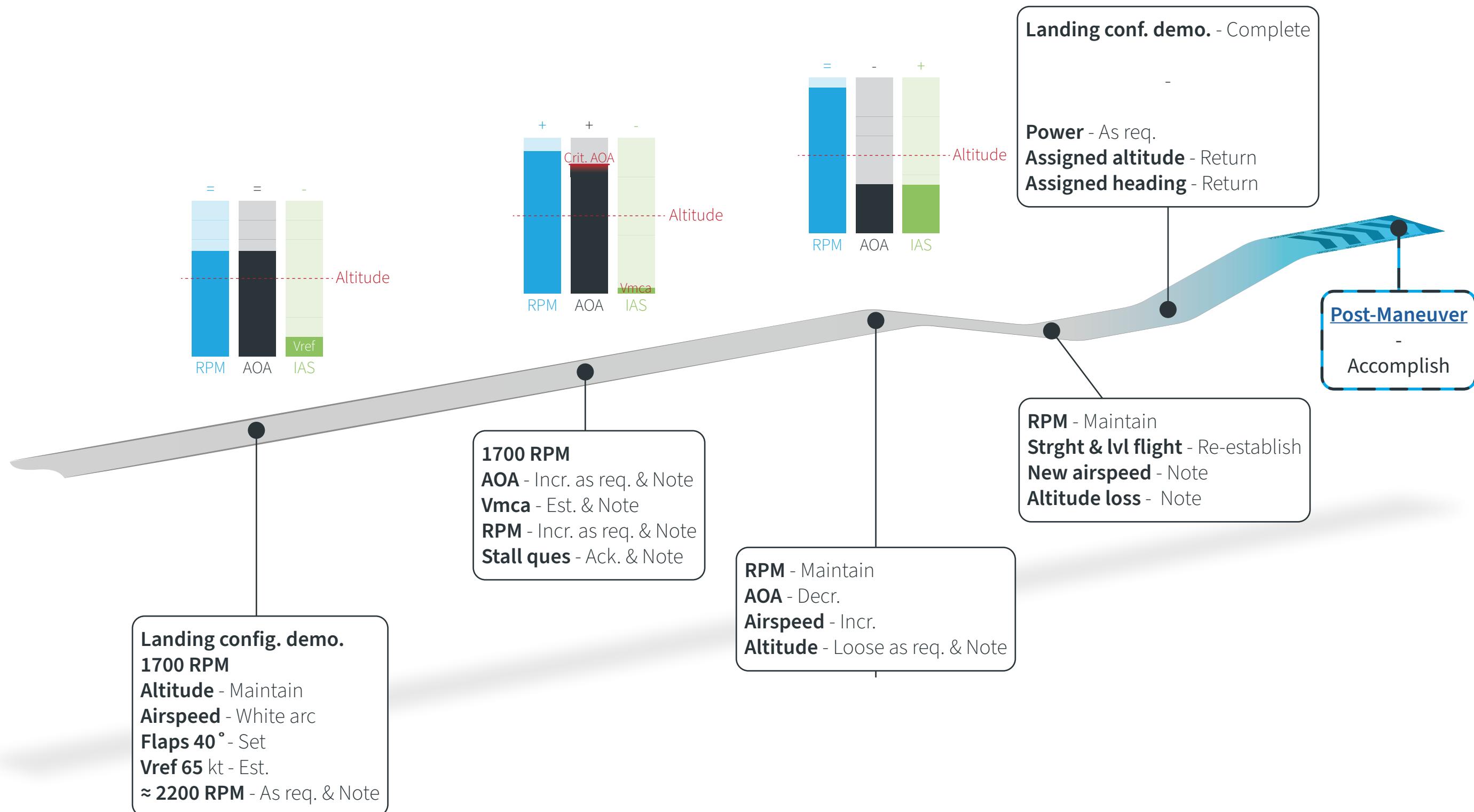


DEMO. OF FLIGHT CHARACTERISTICS (CFI) 1





DEMO. OF FLIGHT CHARACTERISTICS (CFI) 2



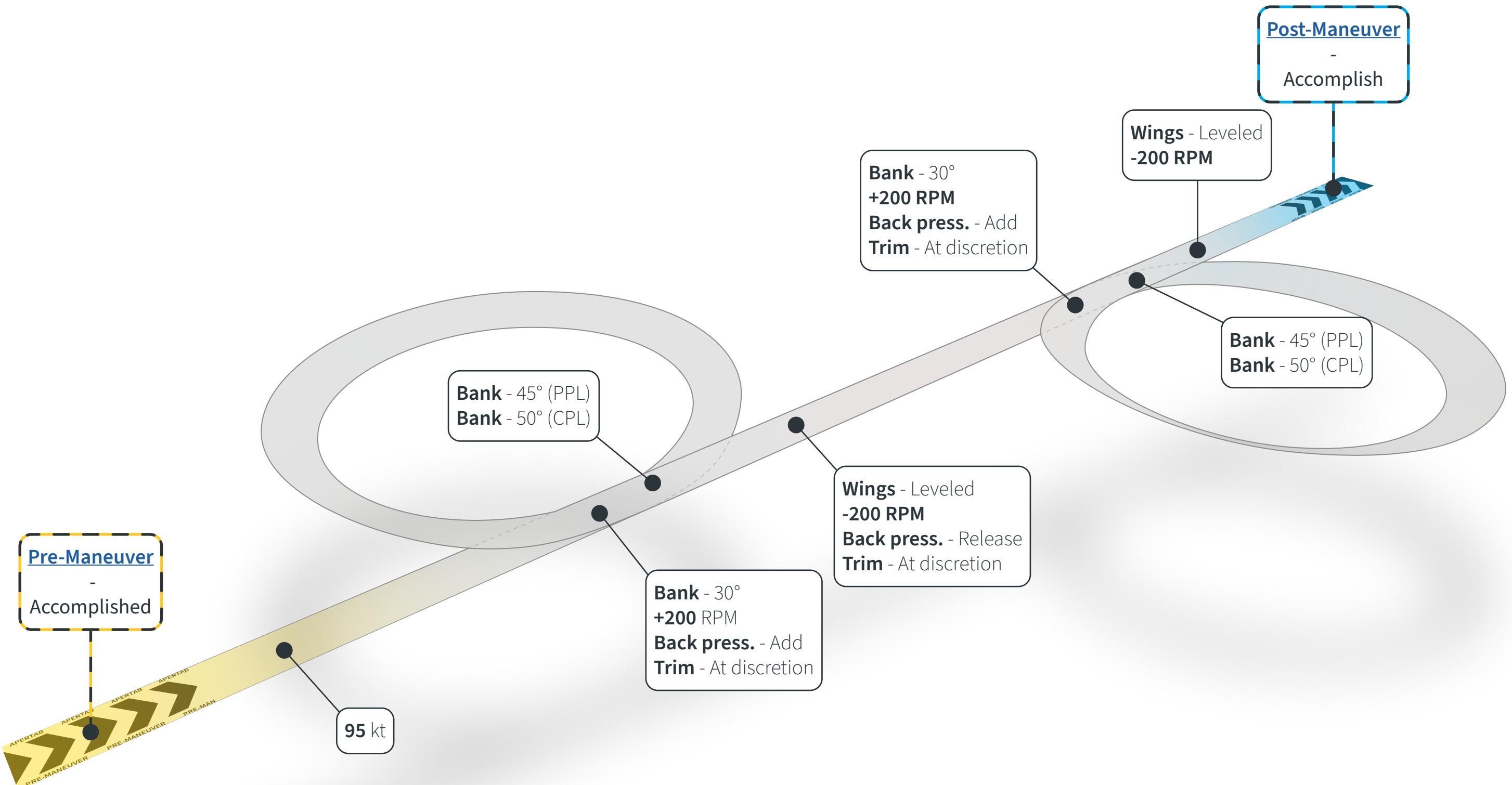


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Part IV: Performance and Ground Reference Maneuvers

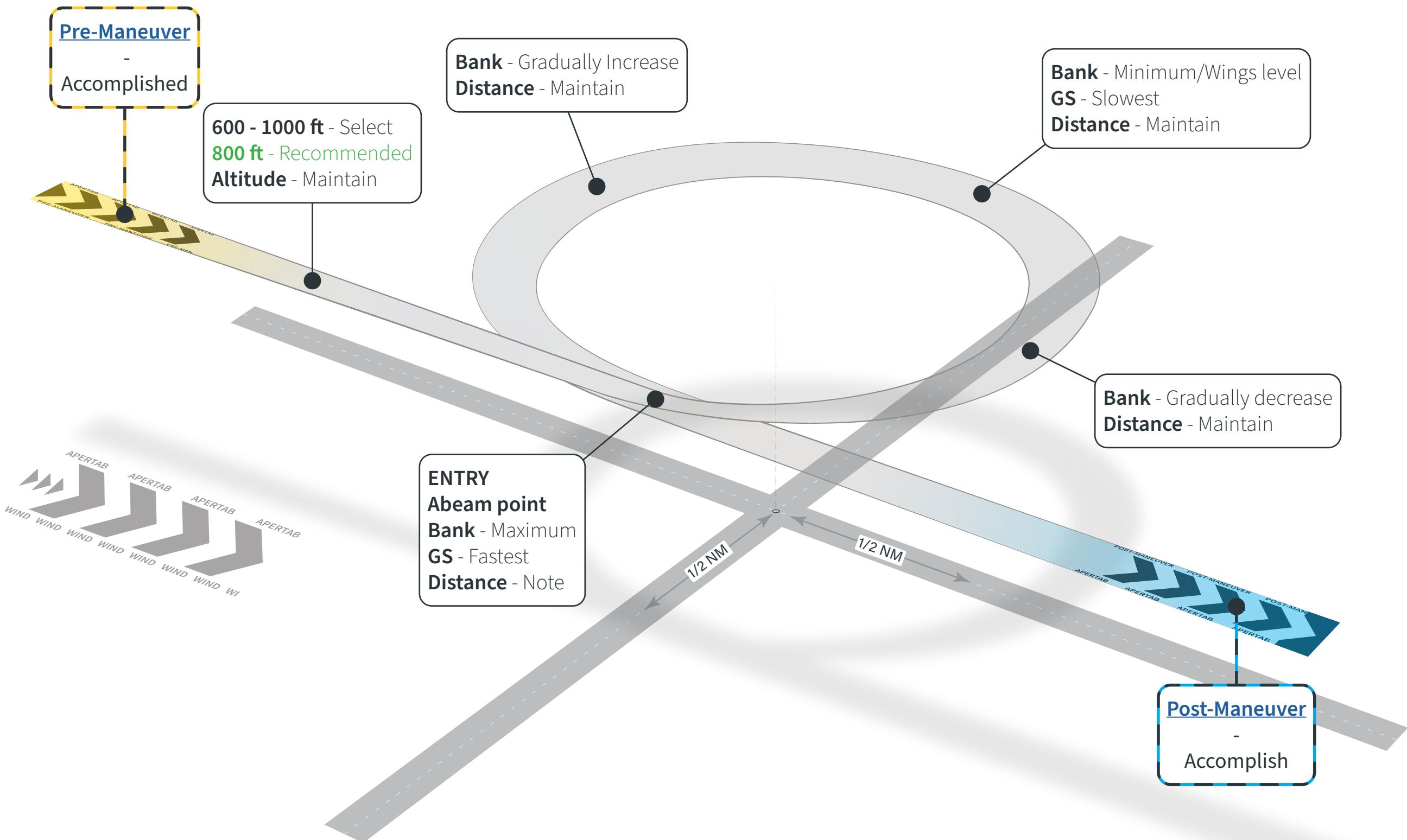


STEEP TURNS



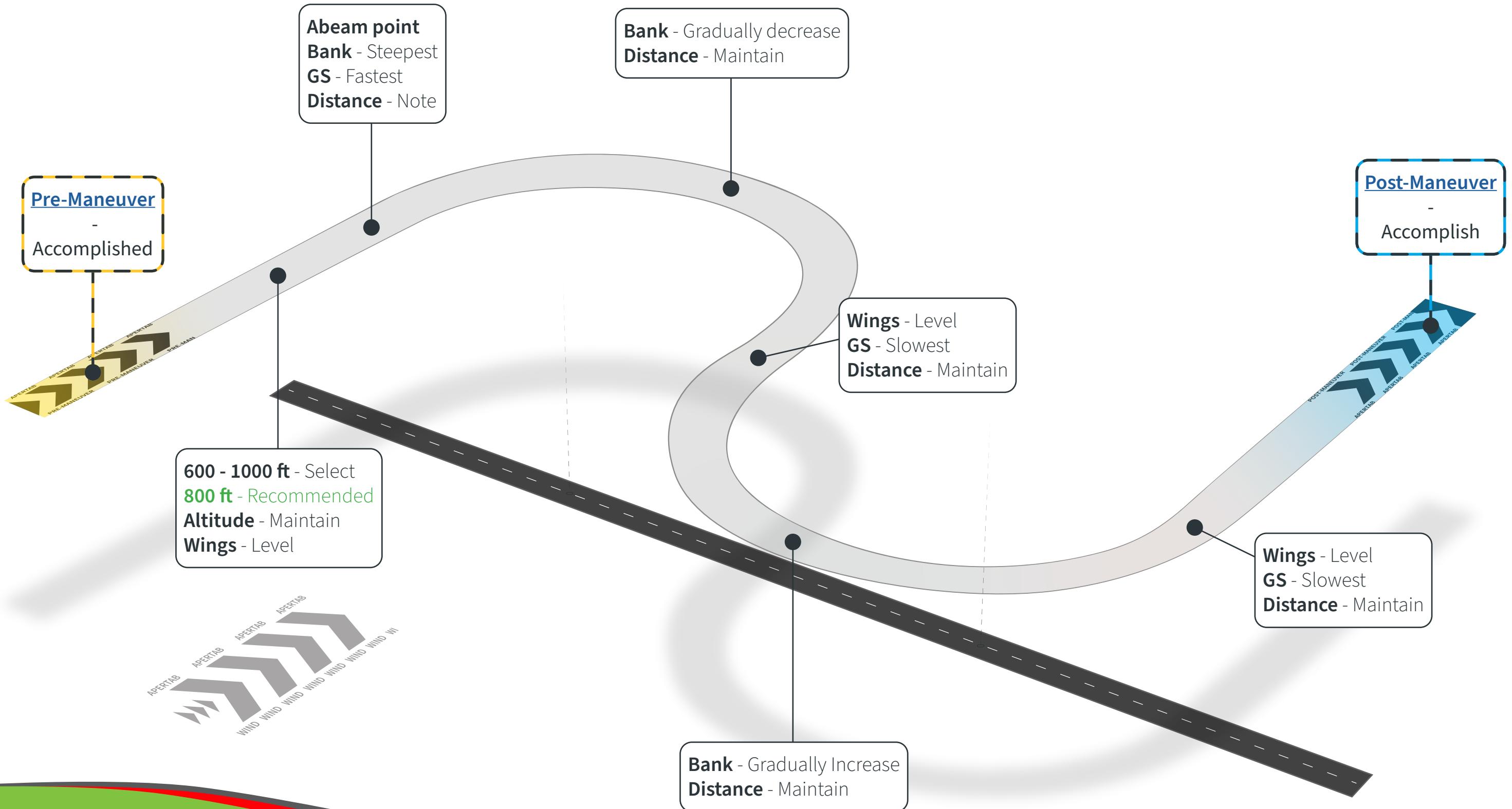


TURN AROUND A POINT



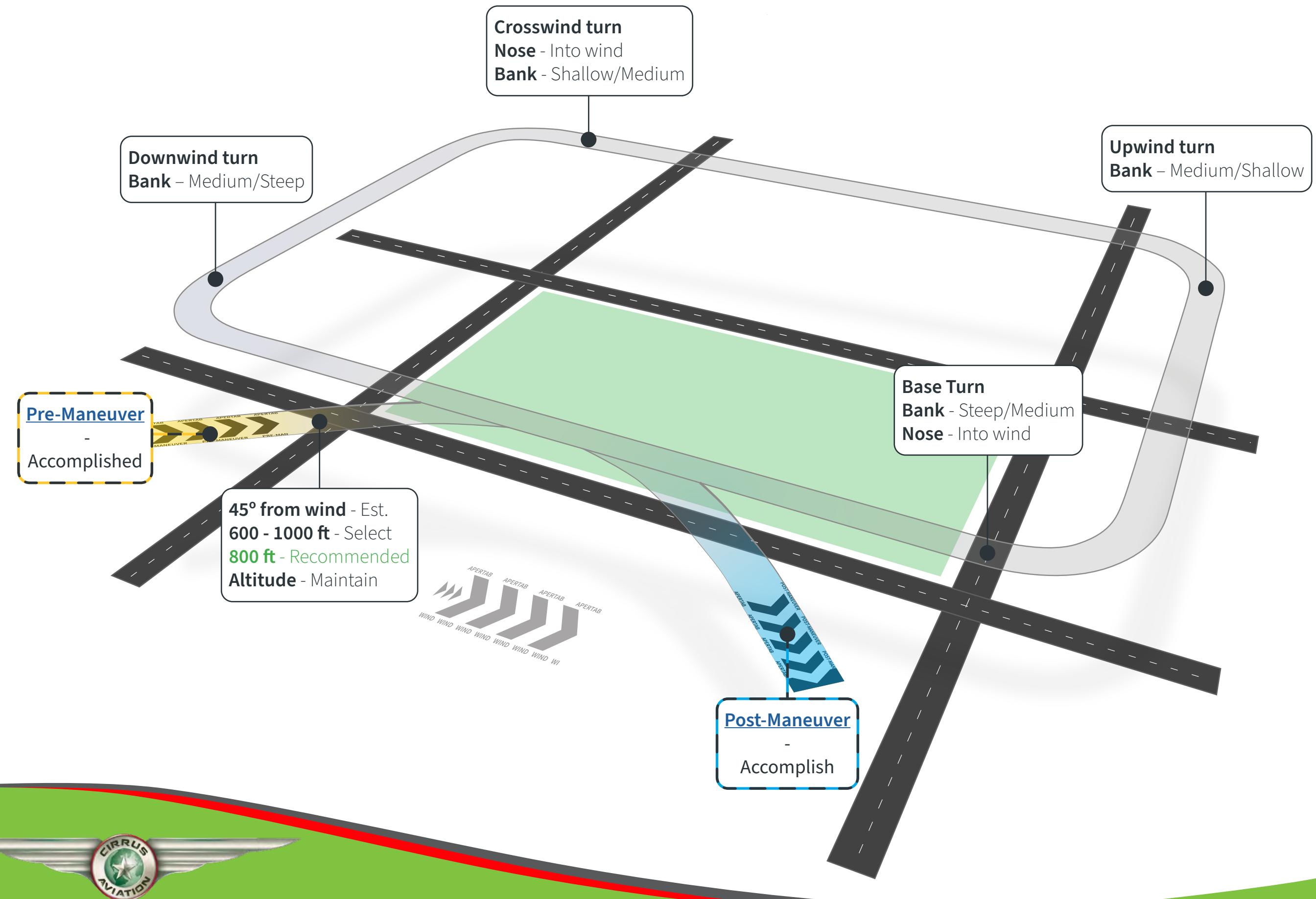


S-TURNS



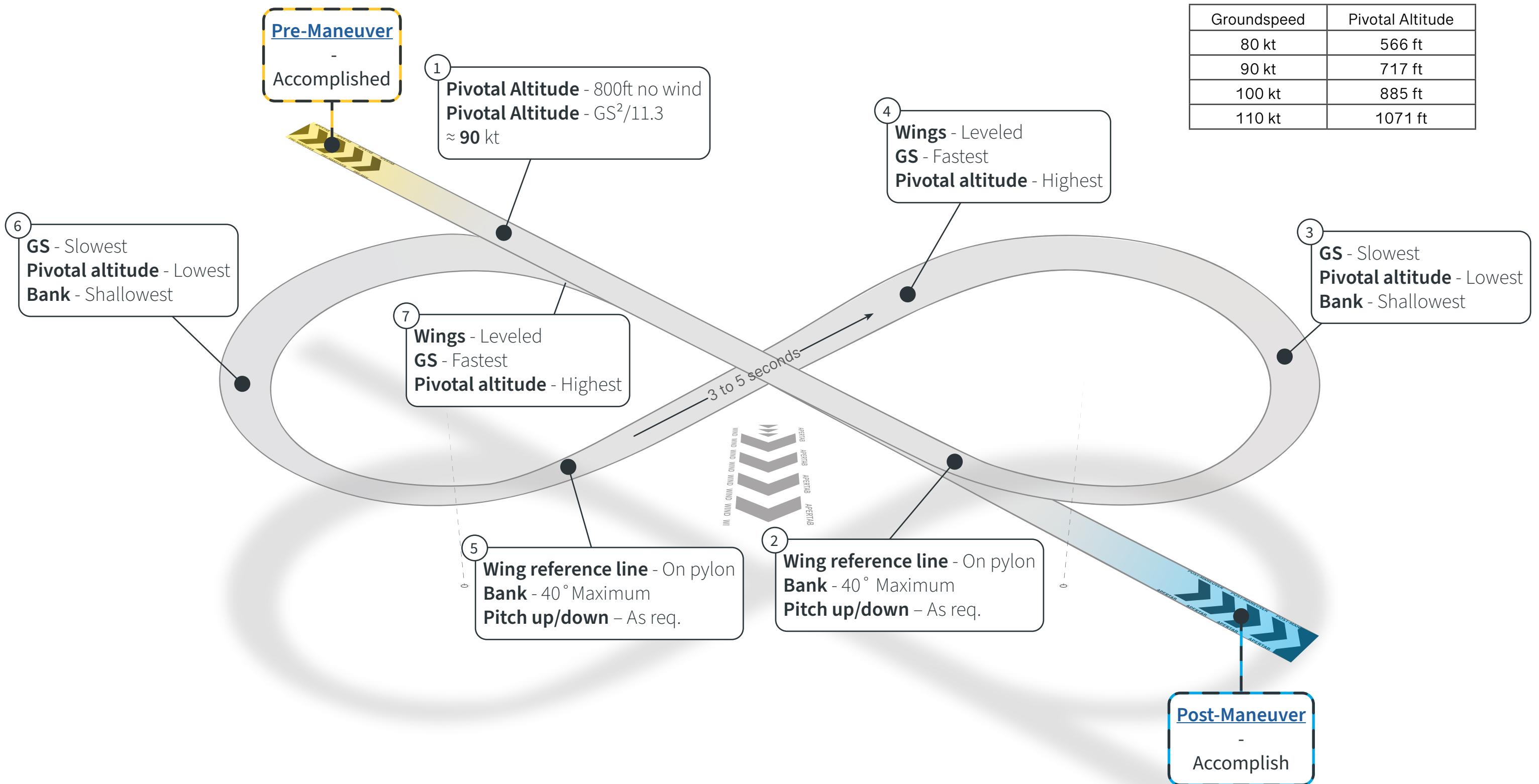


RECTANGULAR COURSE



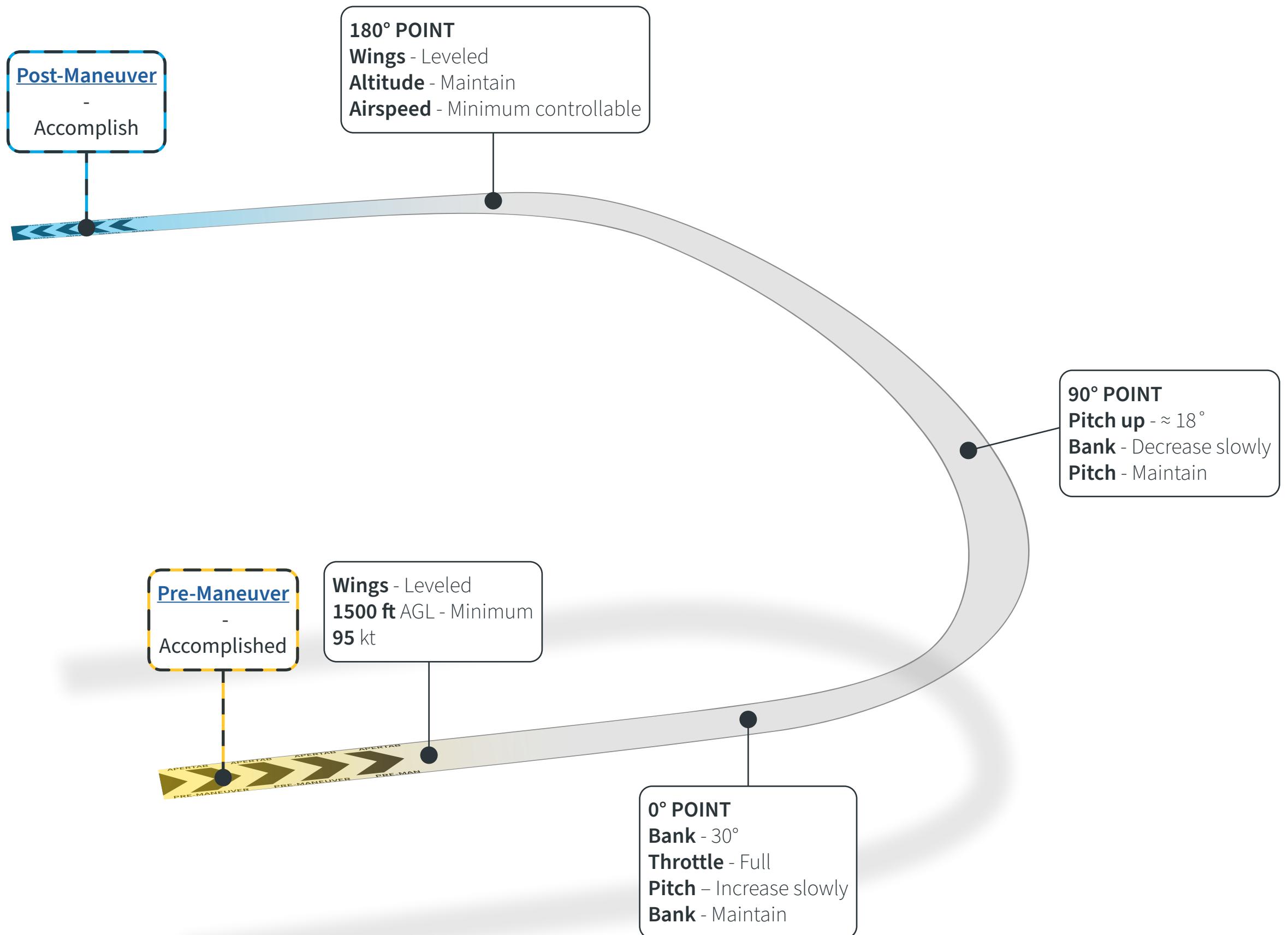


EIGHTS ON PYLONS



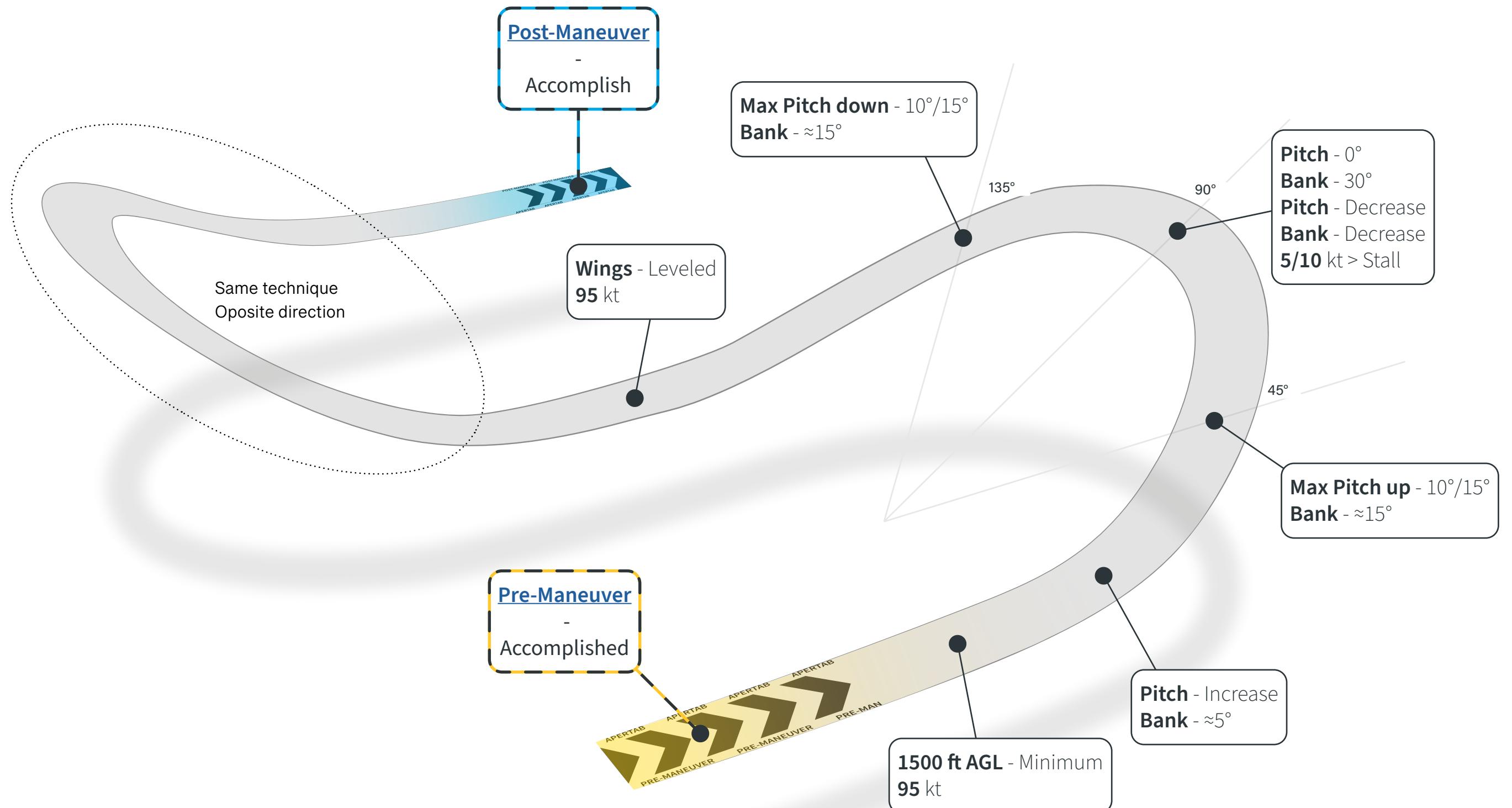


CHANDELLES



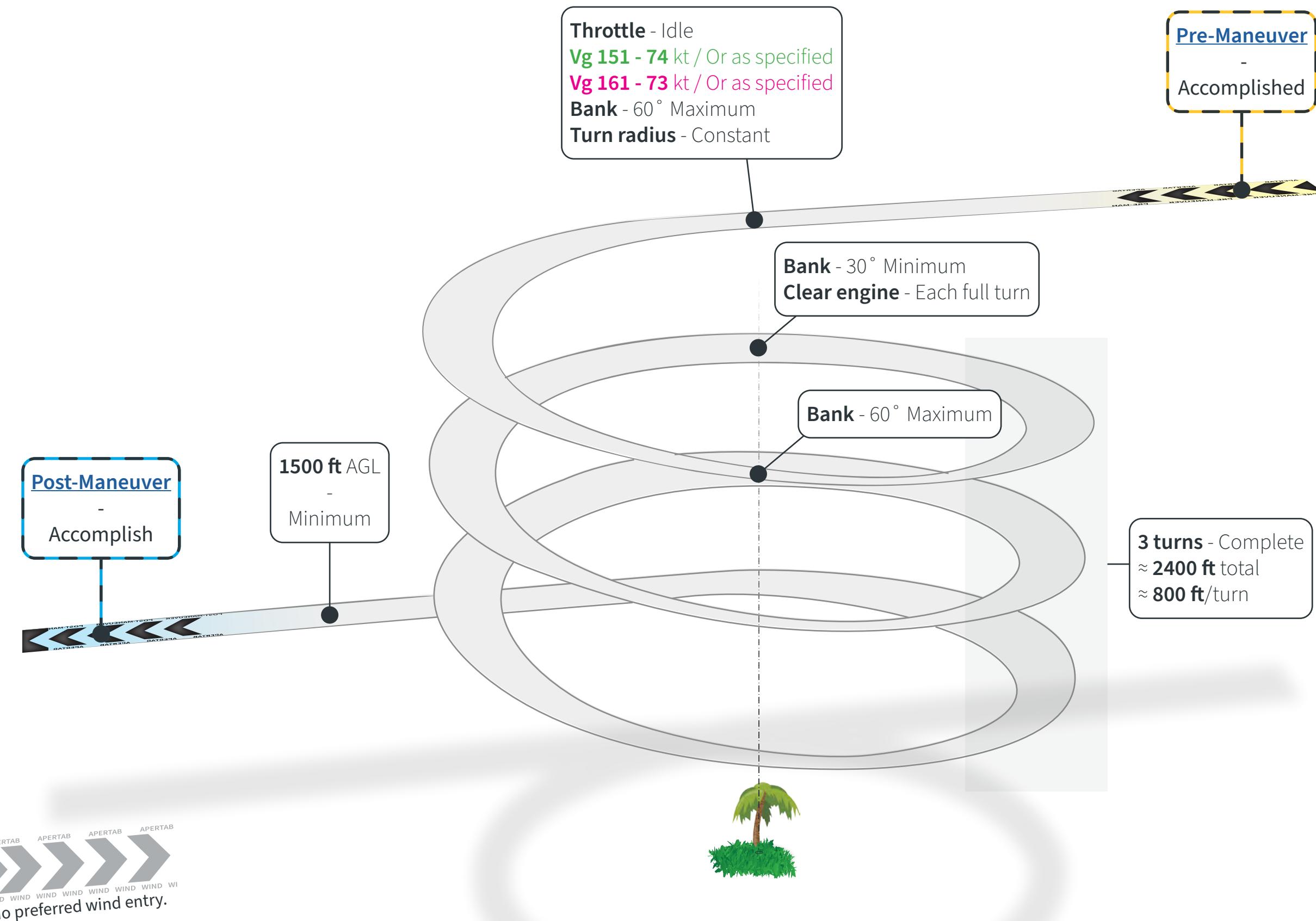


LAZY EIGHTS





STEEP SPIRALS



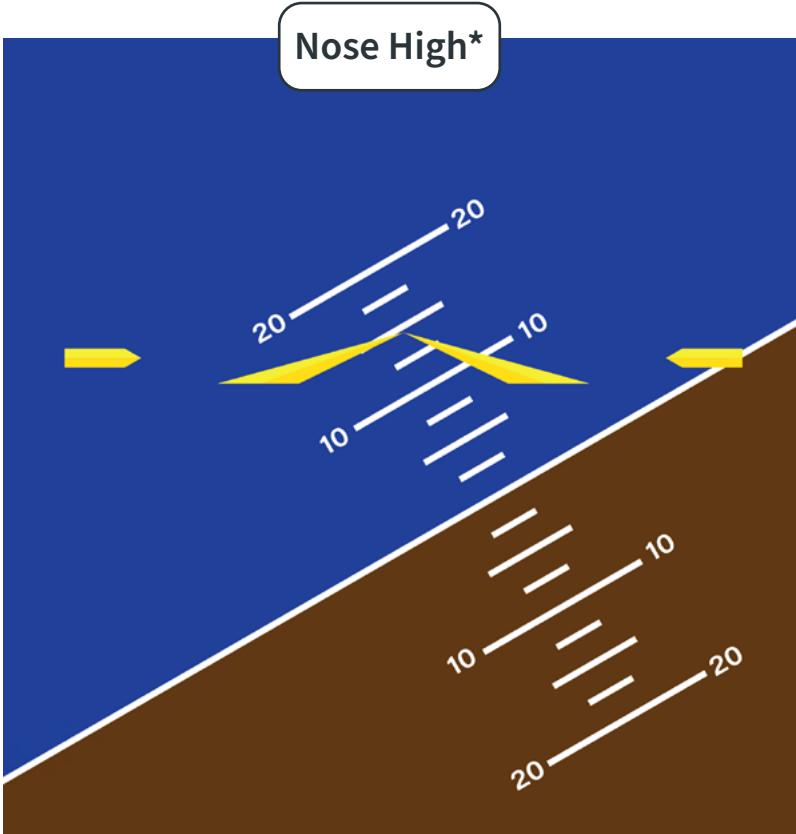


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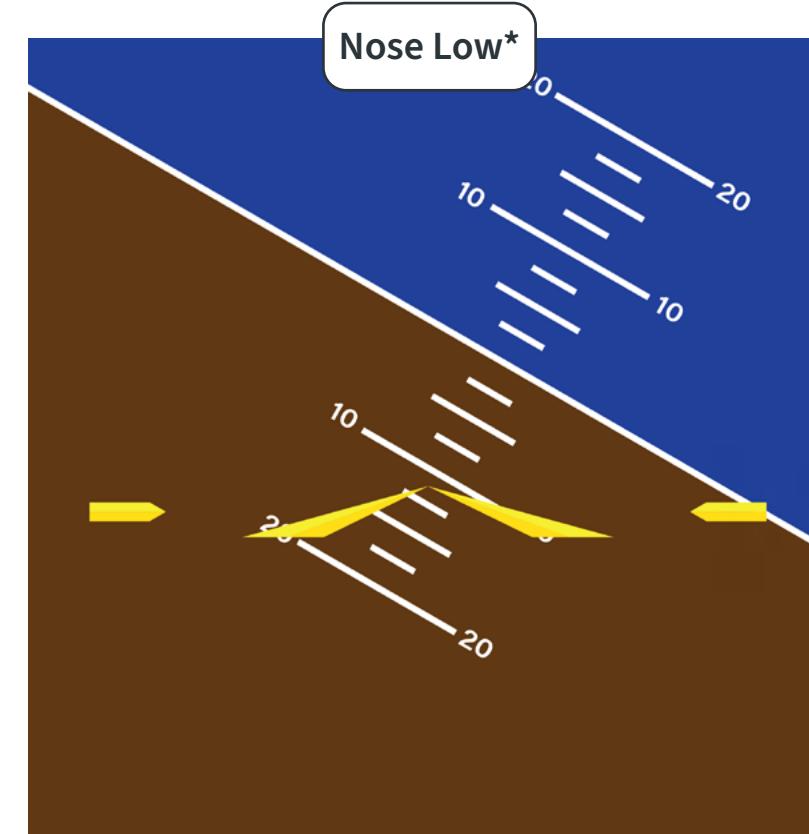
Part V: Emergency Procedures



UNUSUAL ATTITUDE RECOVERY



- 1. POWER** FULL
- 2. PITCH** DECREASE
- 3. WINGS** LEVEL WITH RUDDER COORDINATION
- 4. ALTITUDE** RETURN
- 5. HEADING** RETURN



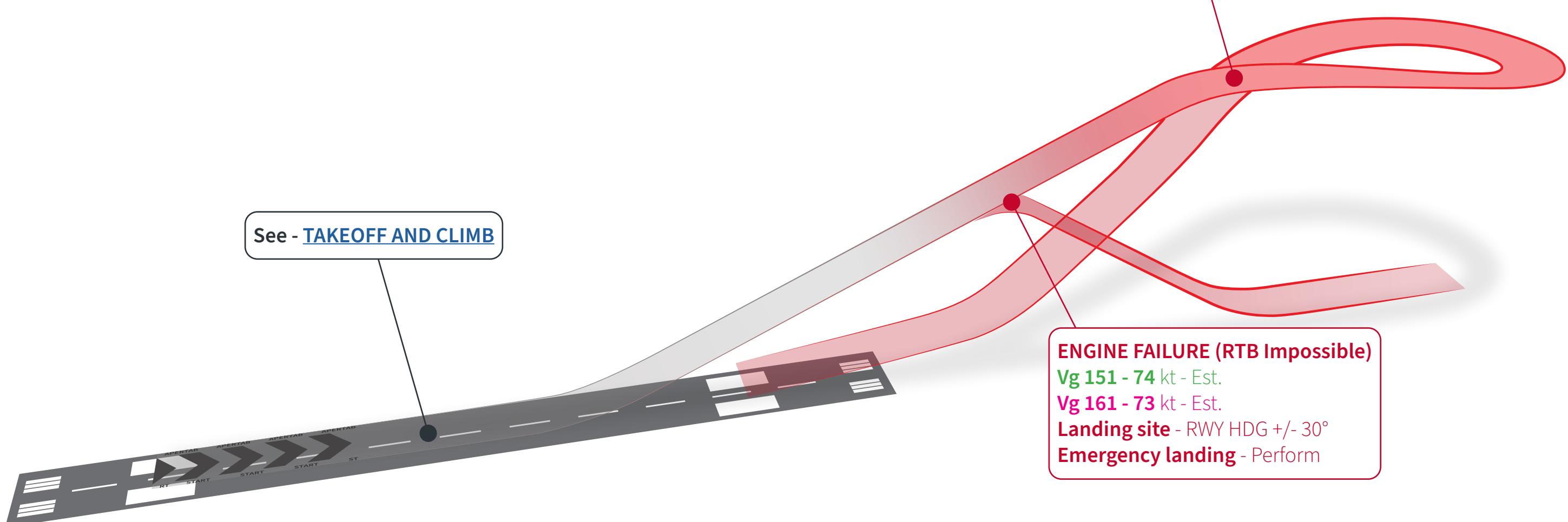
- 1. POWER** IDLE OR AS REQ.
- 2. WINGS** LEVEL WITH RUDDER COORDINATION
- 3. PITCH** INCREASE
- 4. ALTITUDE** RETURN
- 5. HEADING** RETURN

* Nose high or nose low unusual attitudes can be made with a left, right or no bank. The bank does not change the recovery procedure



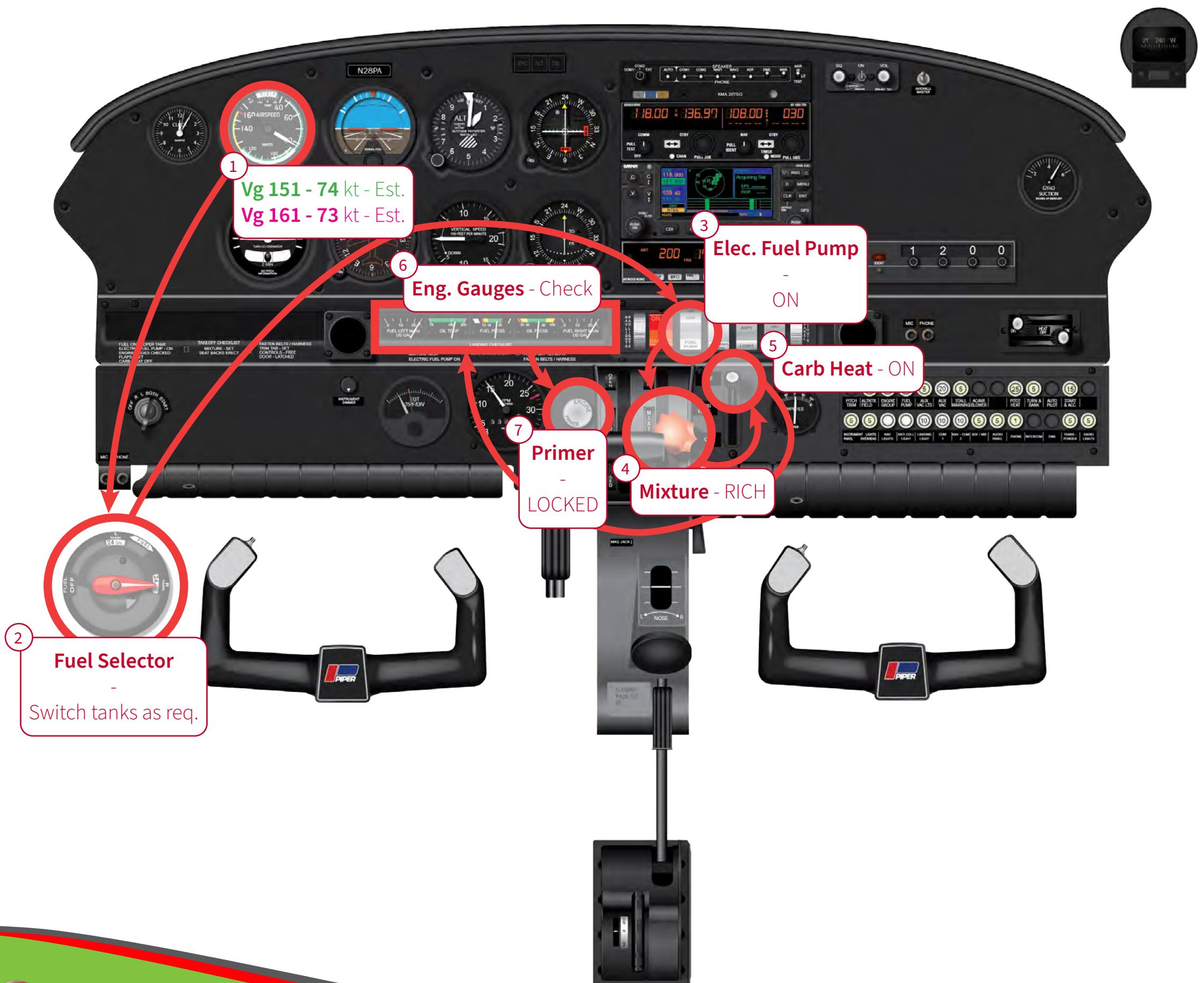


ENGINE FAILURE AFTER TAKEOFF



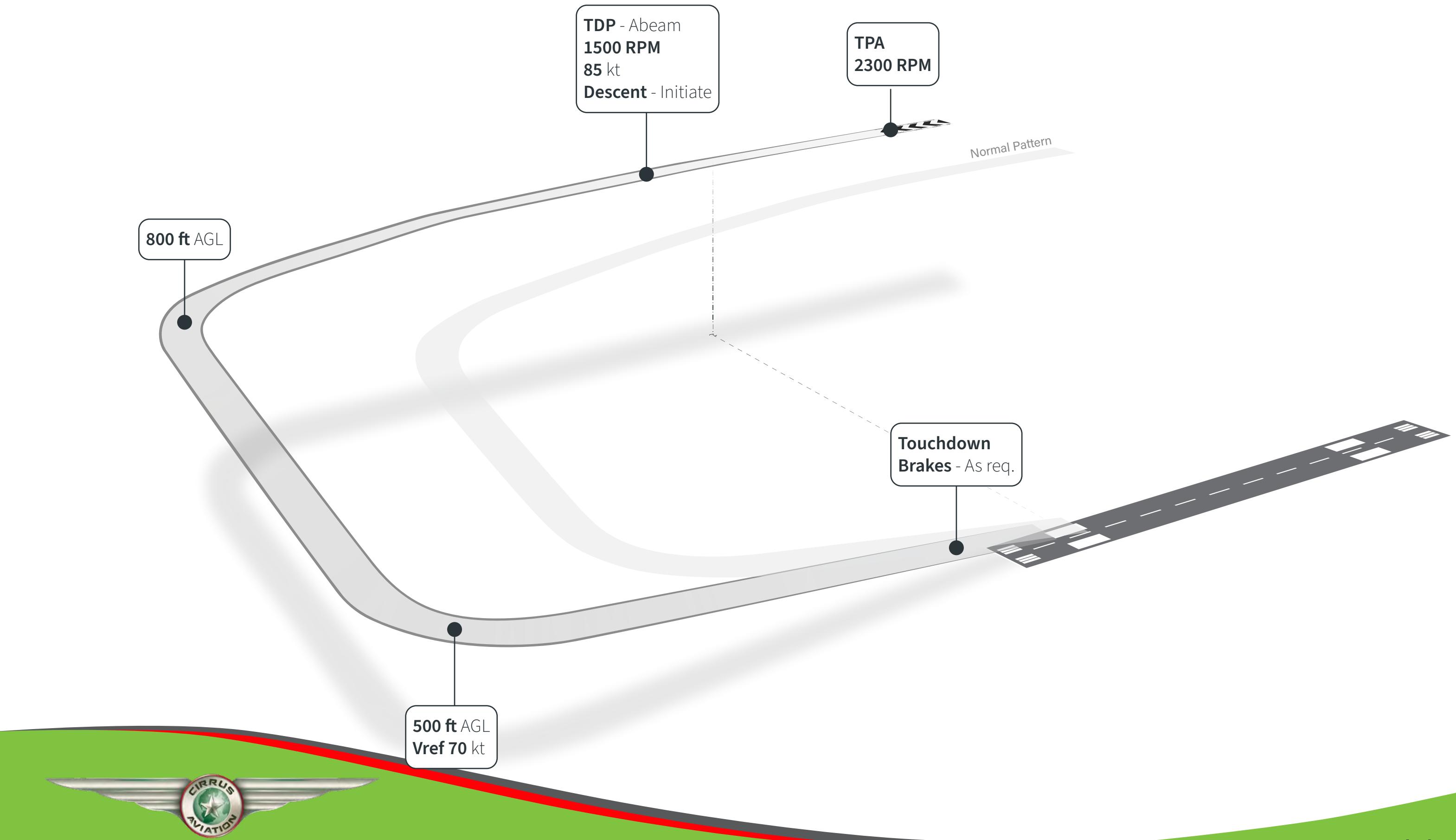


ENGINE FAILURE INFLIGHT - RESTART



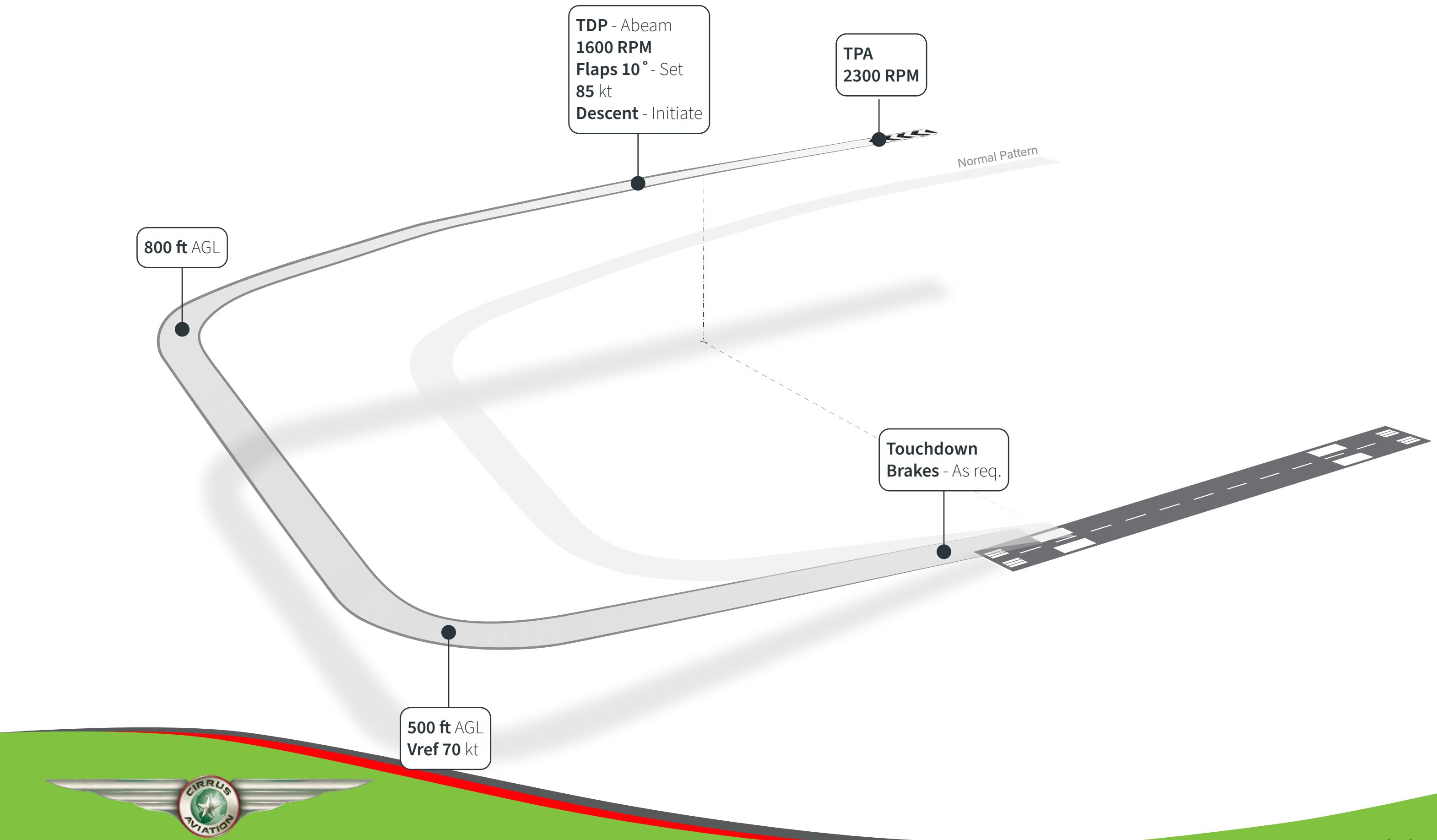


REDUCED FLAPS LANDING - FLAPS 0°



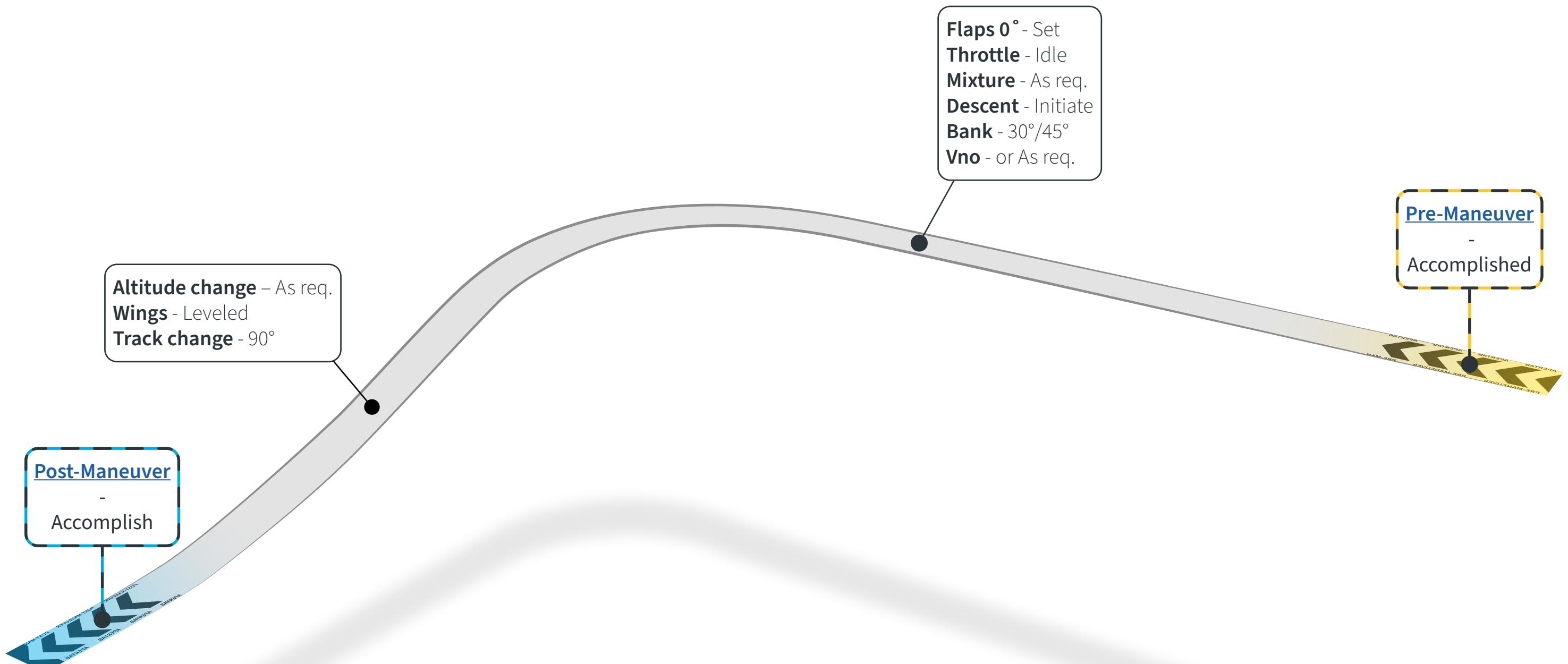


REDUCED FLAPS LANDING - FLAPS 10°



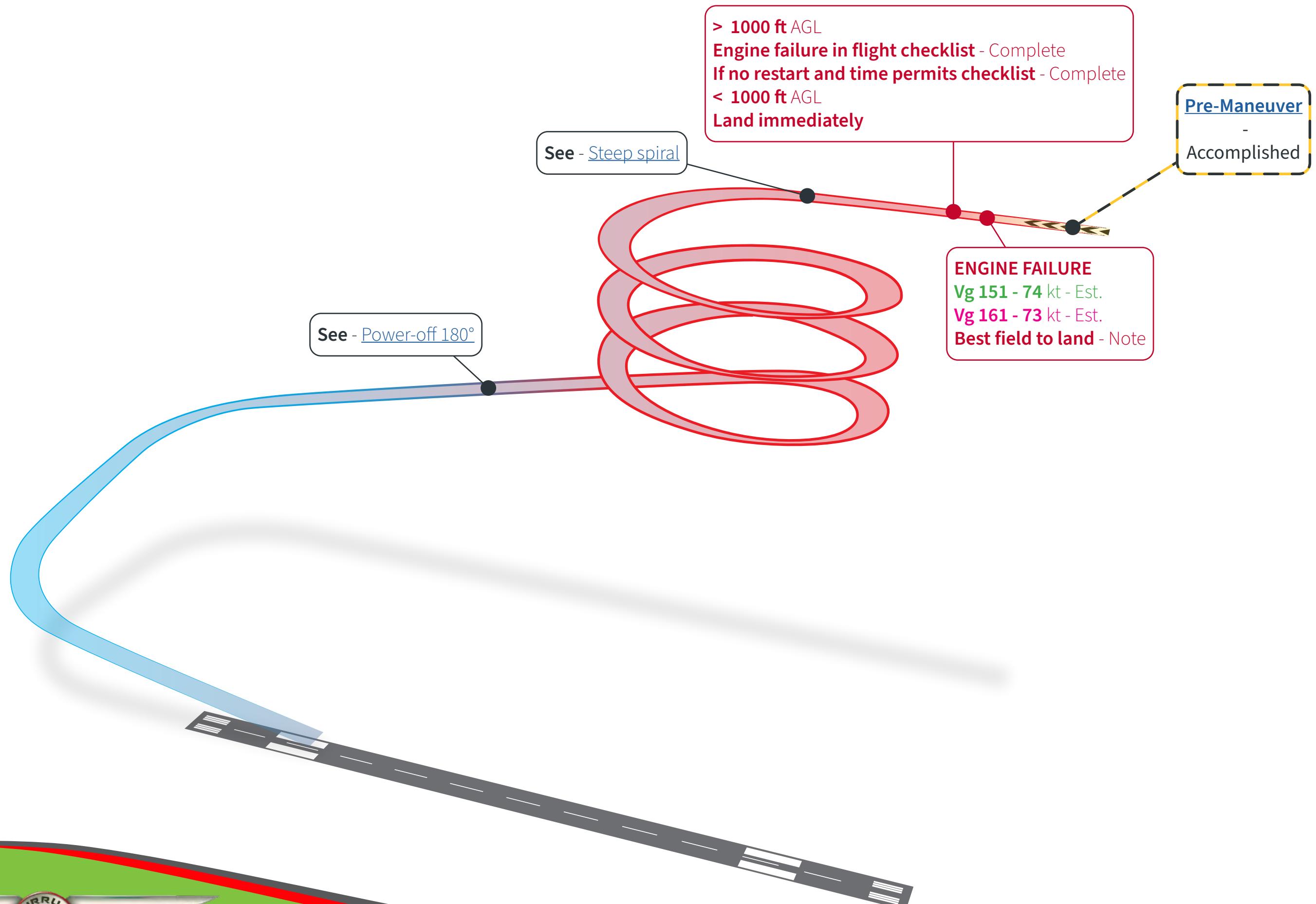


EMERGENCY DESCENT





EMERGENCY APPROACH AND LANDING

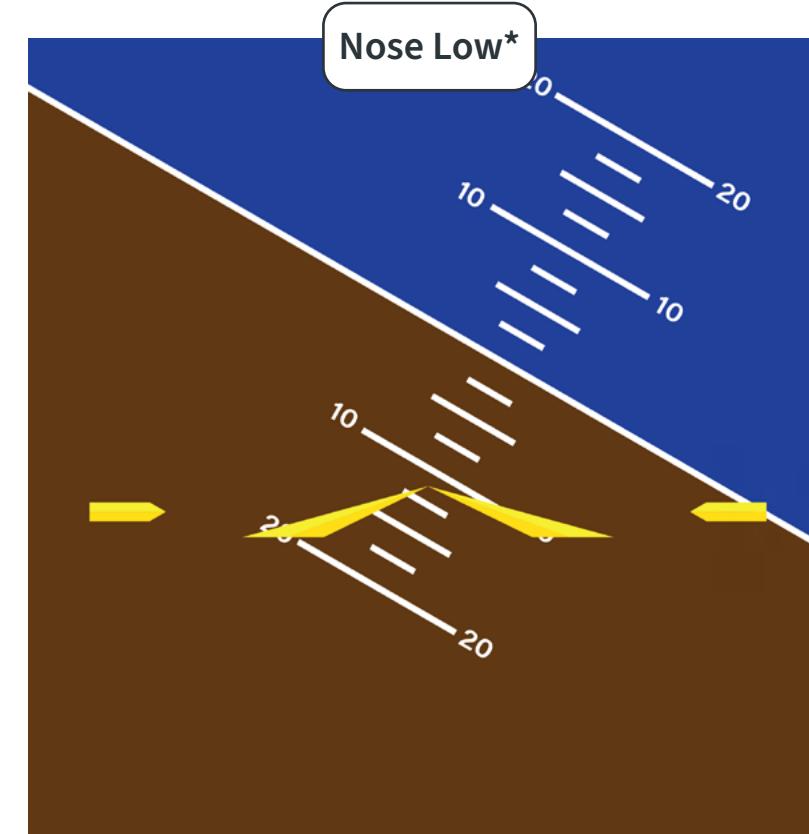
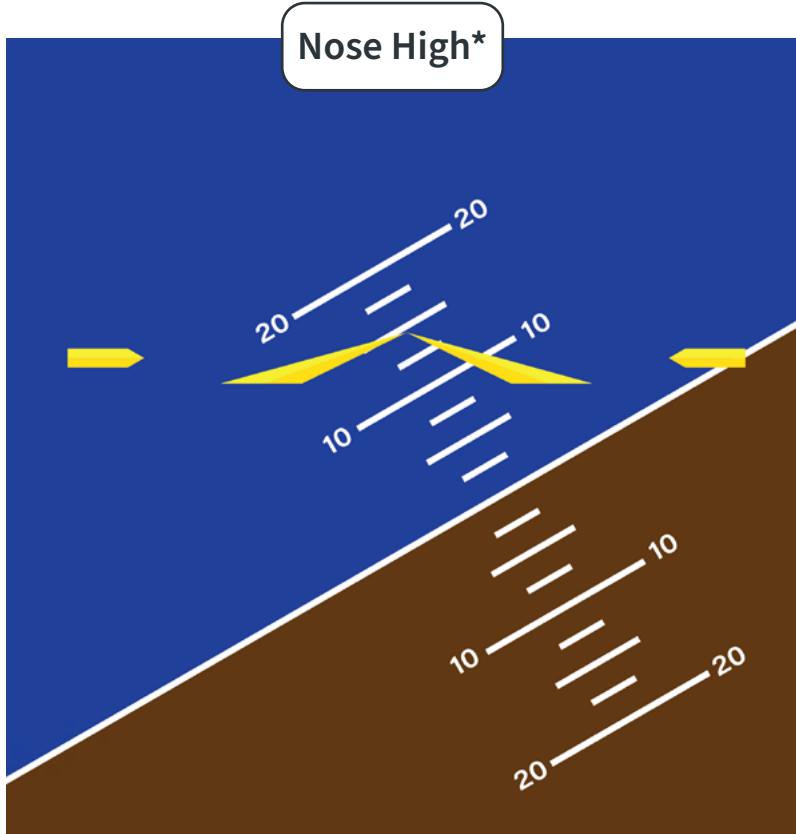




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Part VI: IFR



UNUSUAL ATTITUDE RECOVERY (IMC)



- | | |
|--------------------|--------------------------------|
| 1. POWER | FULL |
| 2. PITCH | DECREASE |
| 3. WINGS | LEVEL WITH RUDDER COORDINATION |
| 4. ALTITUDE | RETURN |
| 5. HEADING | RETURN |

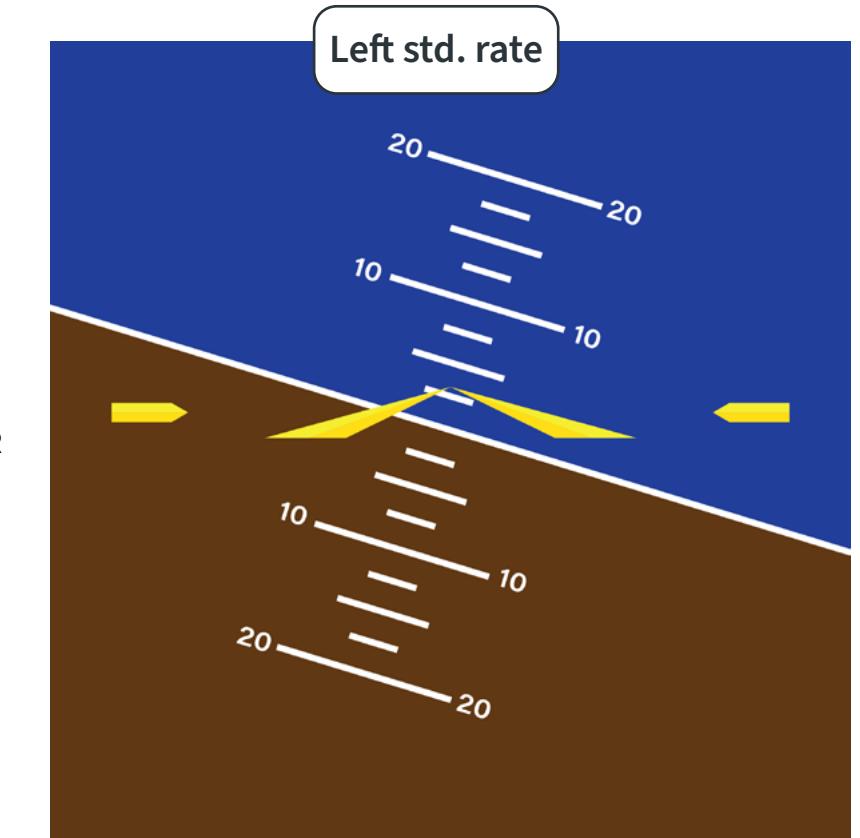
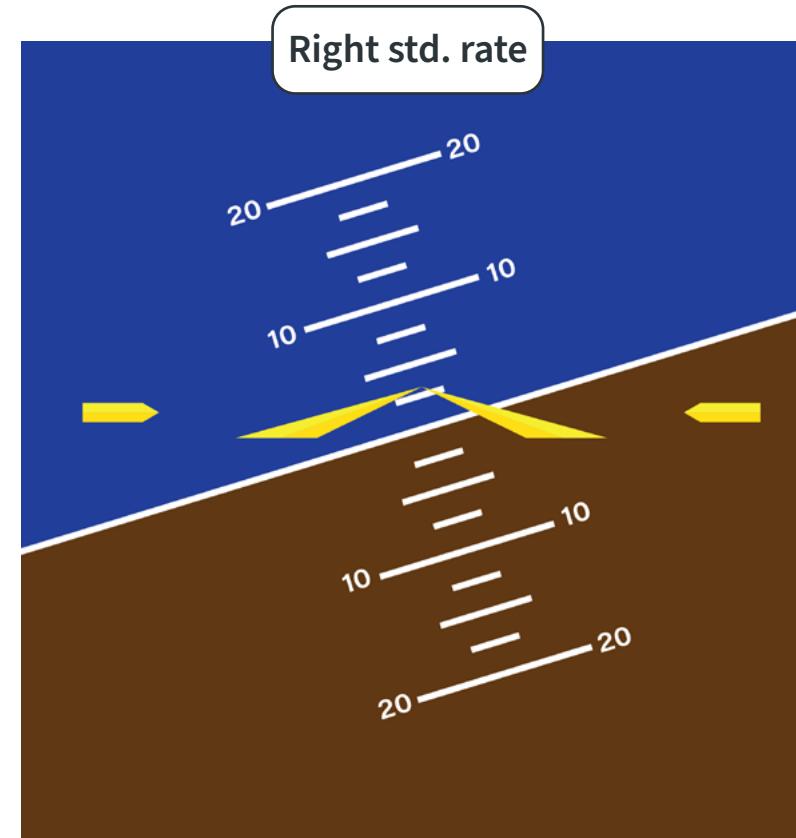
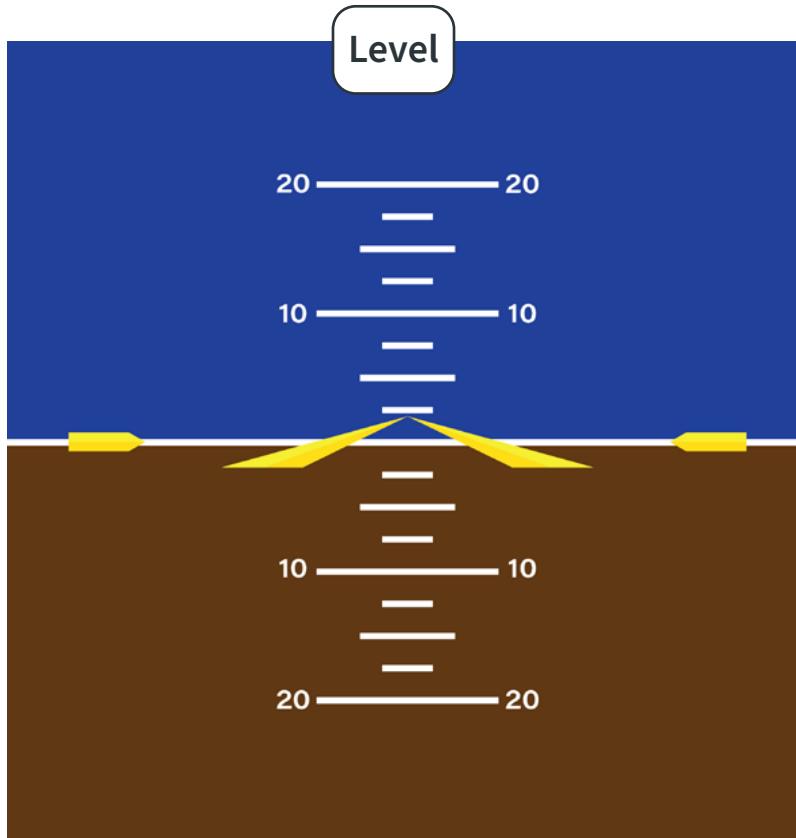
- | | |
|--------------------|--------------------------------|
| 1. POWER | IDLE OR AS REQ. |
| 2. WINGS | LEVEL WITH RUDDER COORDINATION |
| 3. PITCH | INCREASE |
| 4. ALTITUDE | RETURN |
| 5. HEADING | RETURN |

* Nose high or nose low unusual attitudes can be made with a left, right or no bank. The bank does not change the recovery procedure





180 TURNS & STD RATE TURNS (IMC)



- 1. POWER** 2300 RPM
- 2. PITCH** $\approx 2.5^\circ$
- 3. ALTITUDE** MAINTAIN
- 4. HEADING** NOTE

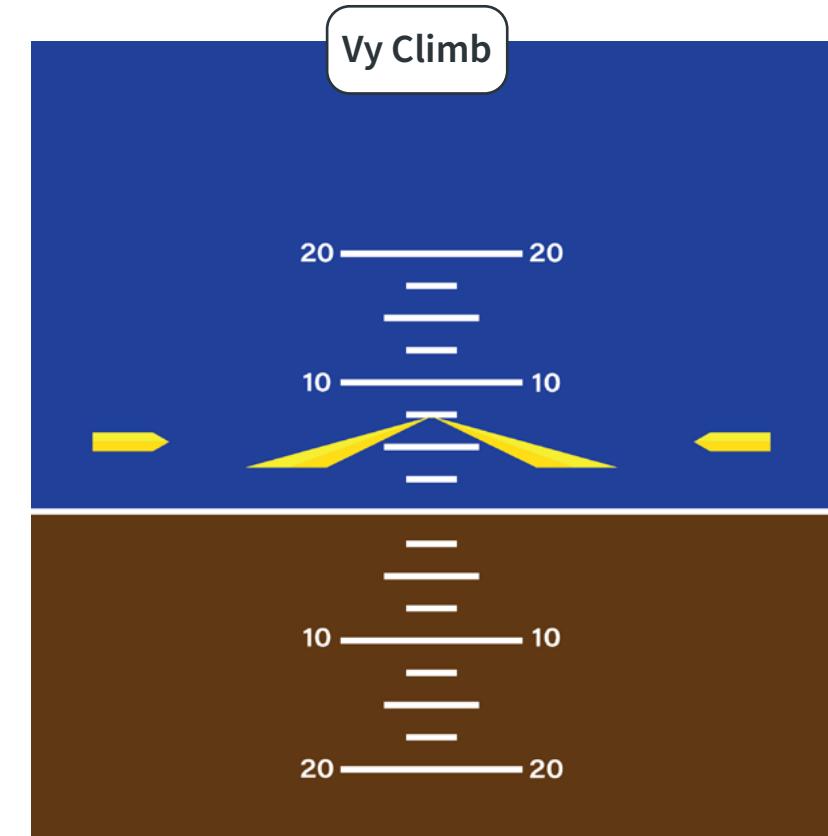
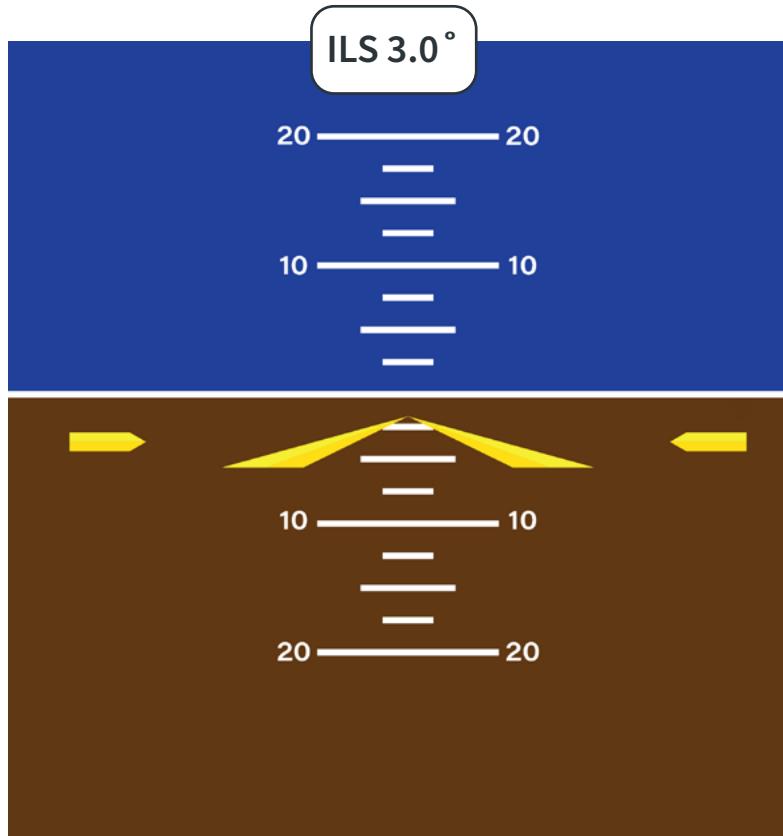
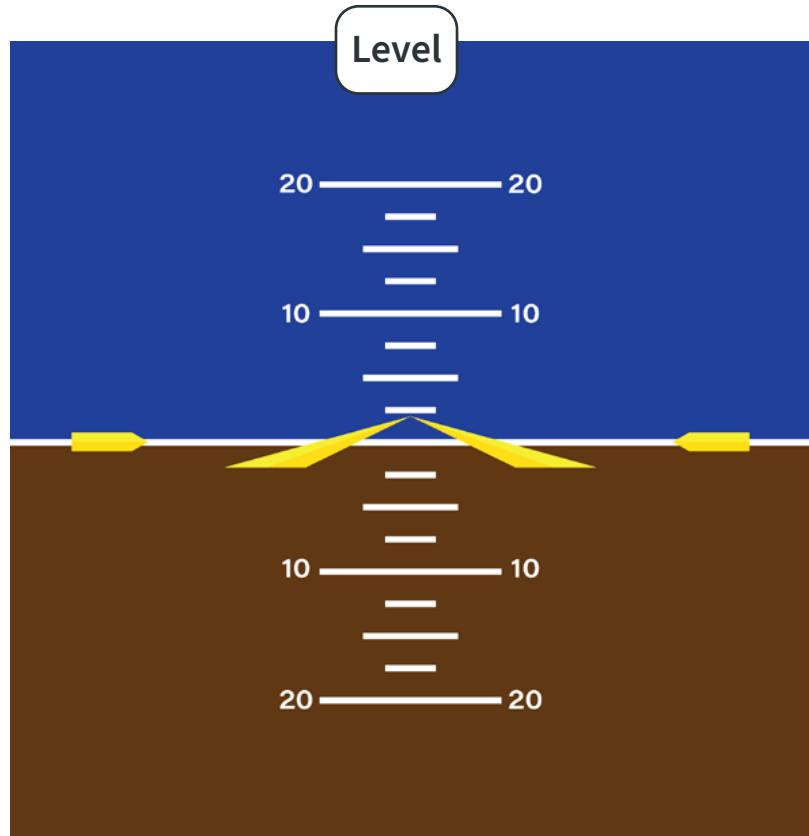
- 1. POWER** + 100 RPM
- 2. PITCH** + 1°
- 3. ALTITUDE** MAINTAIN
- 4. HEADING** + 180° AS REQ

* The bank should match a standard rate, you can use this equation to approximate it:
Bank = (TAS / 10) + 5





IFR BASIC MANEUVERS



- 1. POWER** 2300 RPM
- 2. PITCH** $\approx 2.5^\circ$ UP
- 3. ALTITUDE** MAINTAIN
- 4. HEADING** MAINTAIN

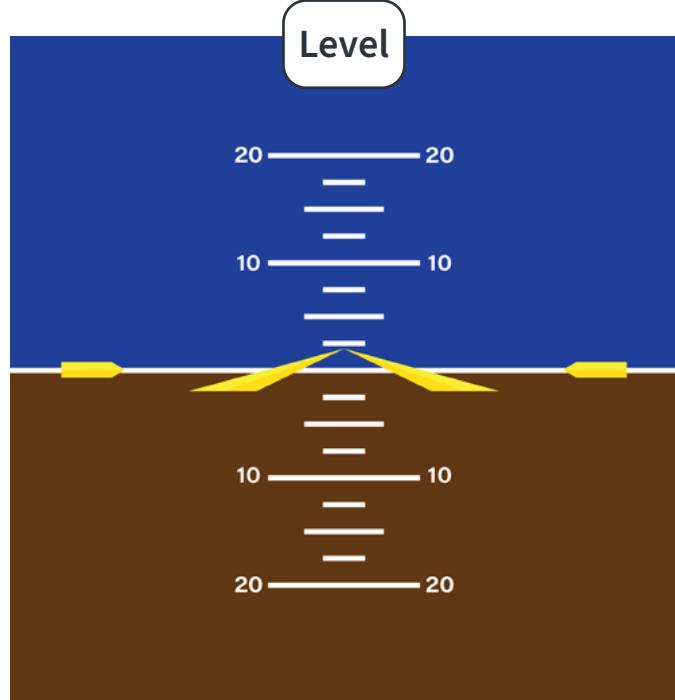
- 1. POWER** 2000 RPM
- 2. PITCH** $\approx -2.0^\circ$ DN
- 3. FLAPS** 10°
- 4. SPEED** 90 KT

- 1. POWER** FULL
- 2. PITCH** $\approx +7.5^\circ$ UP
- 3. SPEED** 76/79 KT
- 4. HEADING** MAINTAIN

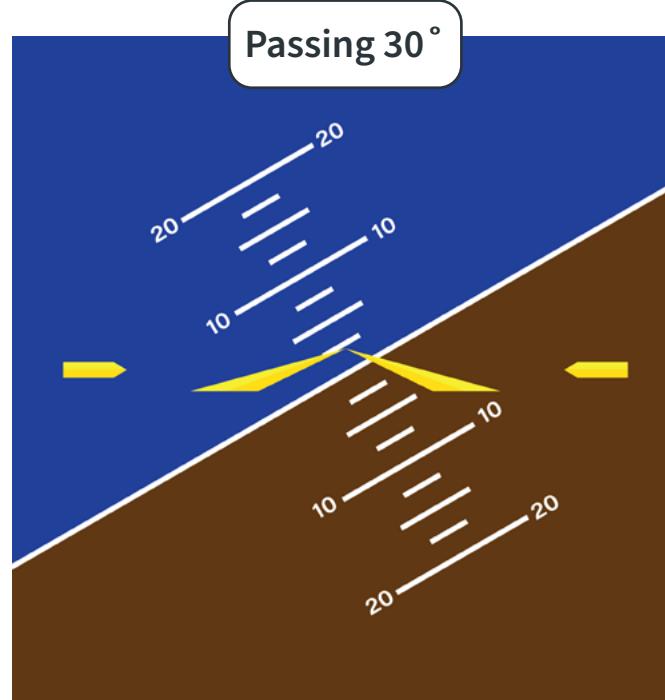




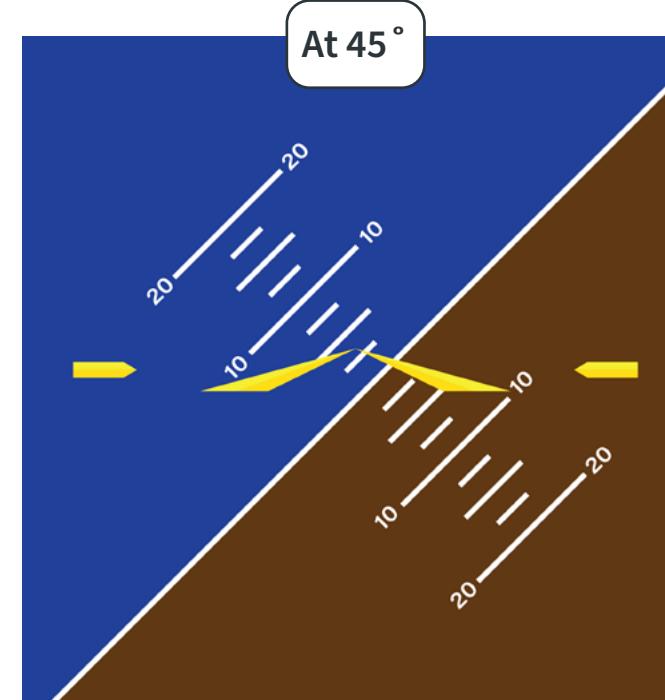
STEEP TURNS IFR



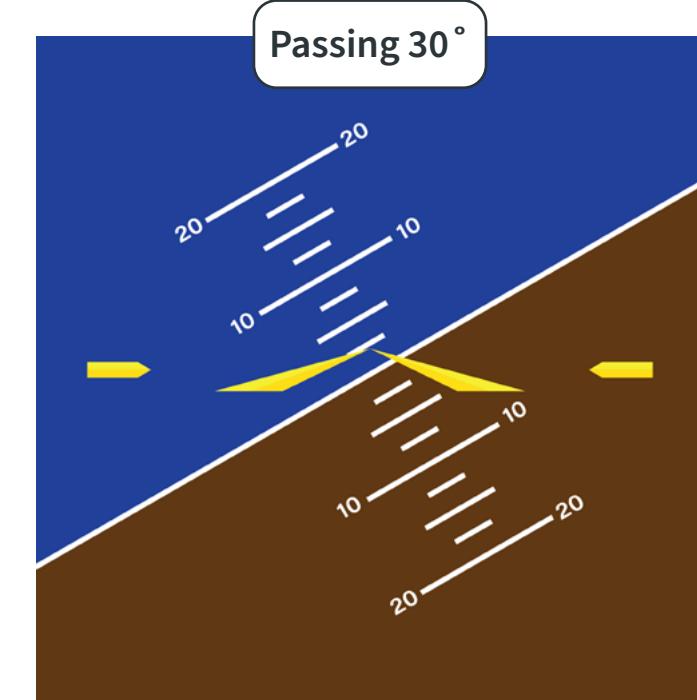
- 1. POWER** 2300 RPM
- 2. PITCH** $\approx 2.5^\circ$ UP
- 3. ALTITUDE** MAINTAIN
- 4. HEADING** NOTE



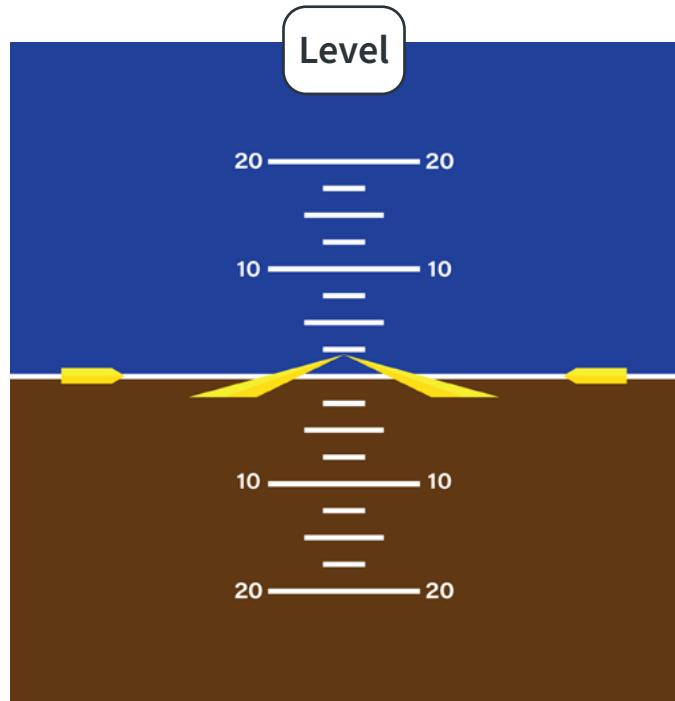
- 1. POWER** + 200 RPM
- 2. PITCH** INCREASE
- 3. ALTITUDE** MAINTAIN
- 4. HEADING** MONITOR



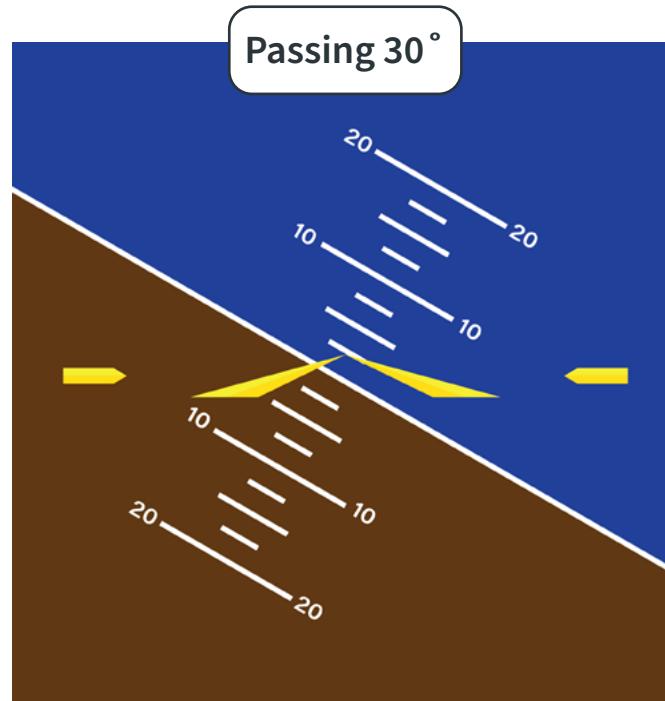
- 1. POWER** AS REQ.
- 2. PITCH** $\approx +1.5^\circ$ UP
- 3. ALTITUDE** MAINTAIN
- 4. HEADING** MONITOR



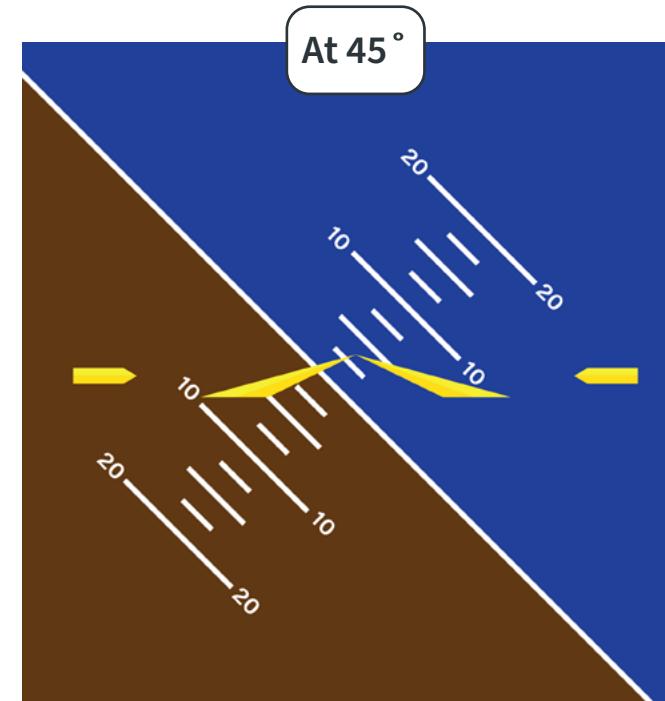
- 1. POWER** - 200 RPM
- 2. PITCH** DECREASE
- 3. ALTITUDE** MAINTAIN
- 4. HEADING** MONITOR



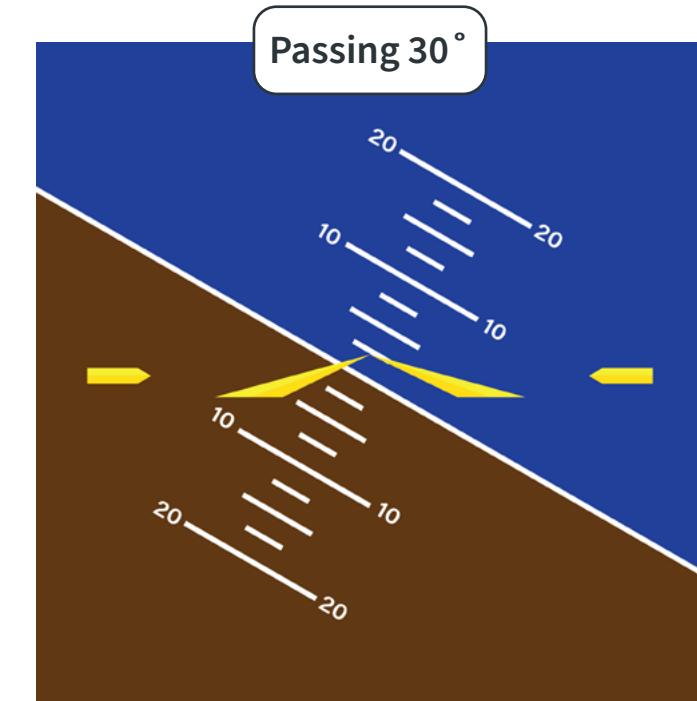
- 1. POWER** 2300 RPM
- 2. PITCH** $\approx 2.5^\circ$ UP
- 3. ALTITUDE** MAINTAIN
- 4. HEADING** NOTE



- 1. POWER** + 200 RPM
- 2. PITCH** INCREASE
- 3. ALTITUDE** MAINTAIN
- 4. HEADING** MONITOR



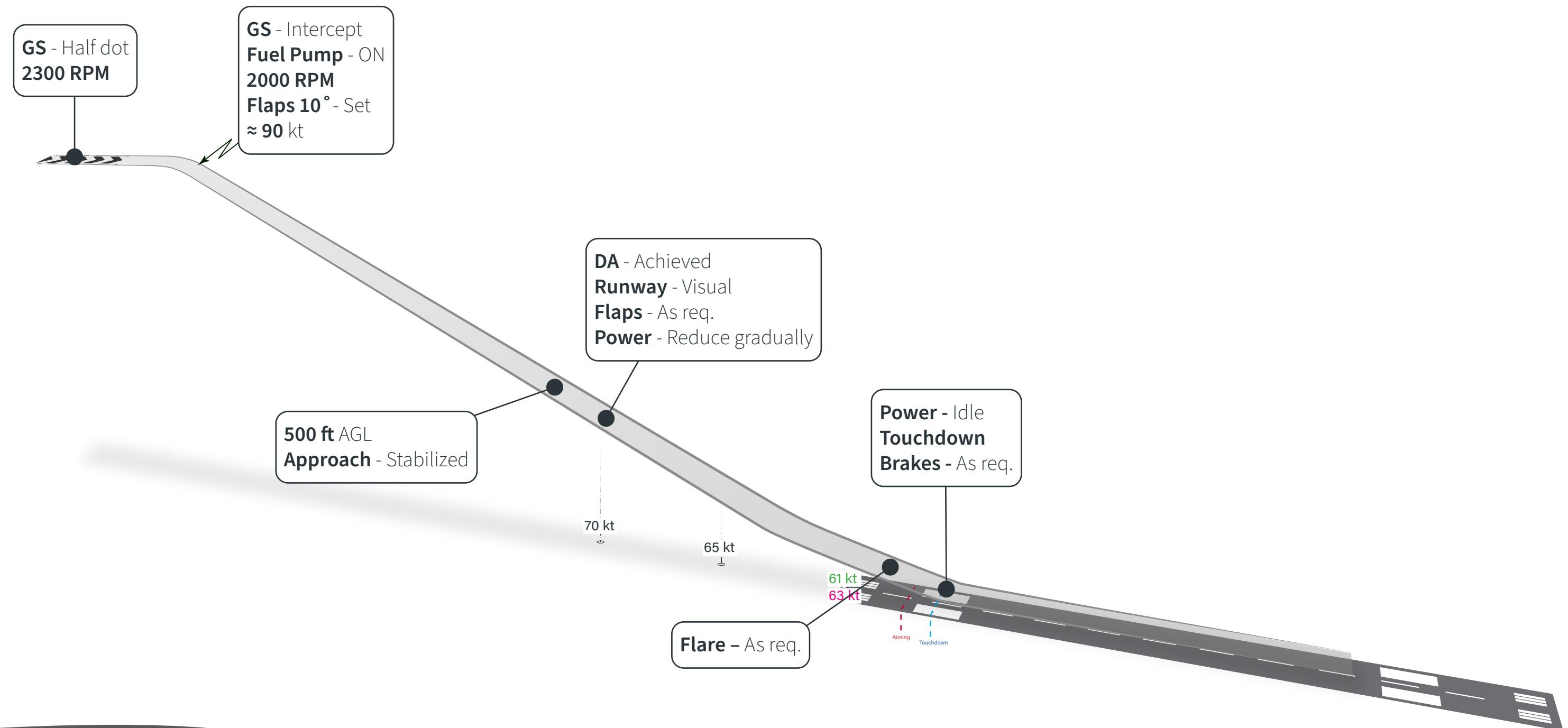
- 1. POWER** AS REQ.
- 2. PITCH** $\approx +1.5^\circ$ UP
- 3. ALTITUDE** MAINTAIN
- 4. HEADING** MONITOR



- 1. POWER** - 200 RPM
- 2. PITCH** DECREASE
- 3. ALTITUDE** MAINTAIN
- 4. HEADING** MONITOR

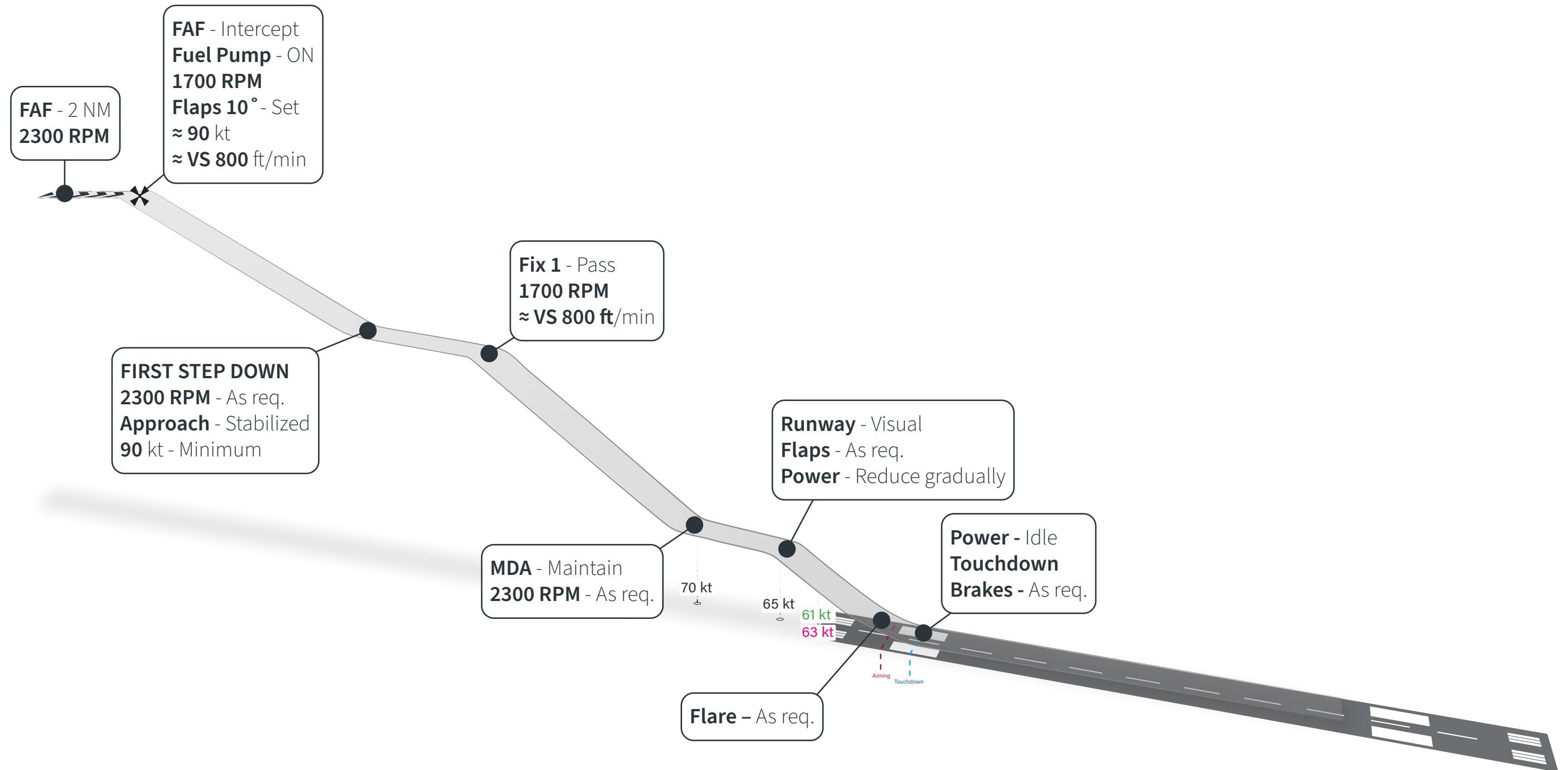


PRECISION APPROACH



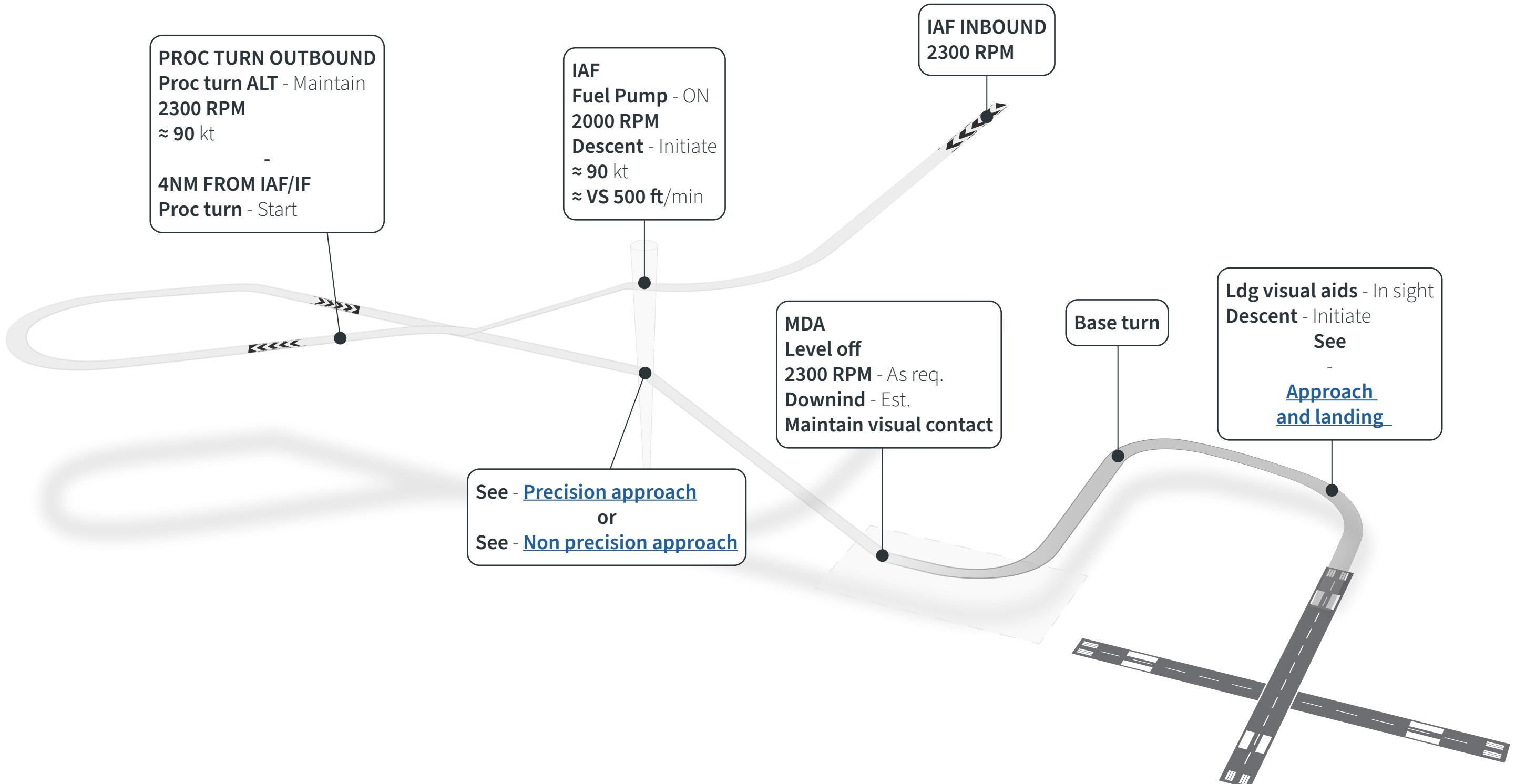


NON PRECISION APPROACH



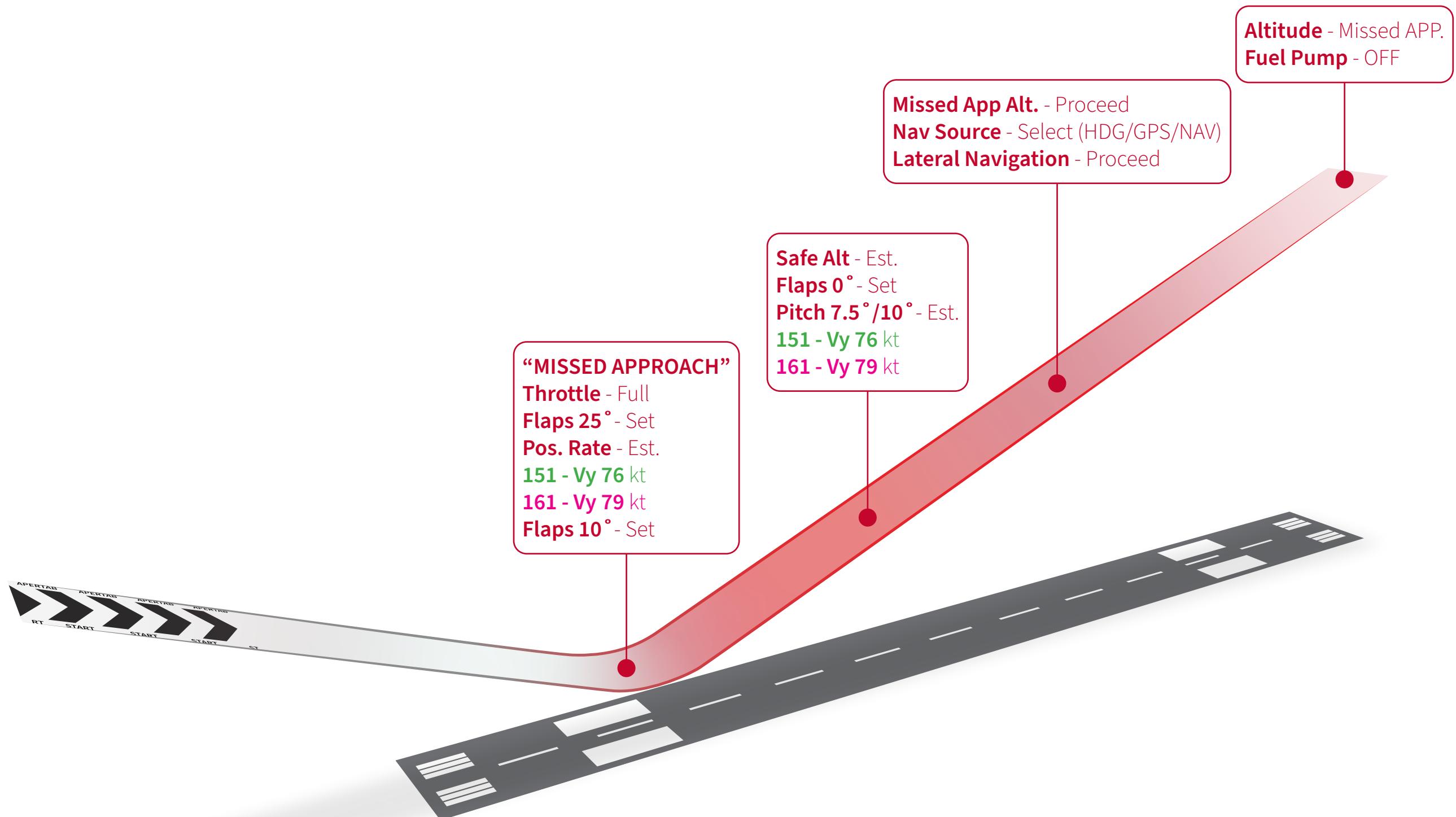


PROC. TURN & CIRCLING APPROACH





MISSED APPROACH





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Part VII: Cockpit Flows



ACCEPTANCE FLOW



1. AVIONICS → OFF
2. ENVIRONMENTAL → OFF
3. BREAKERS → ALL IN
4. PANEL LIGHTS → OFF
5. ALL LIGHTS → OFF
6. ALL SWITCHES → OFF
7. BATT → OFF
8. CARB HEAT → OFF
9. MIXTURE → FULL LEAN
10. RUDDER TRIM → NEUTRAL
11. FLAPS → UP
12. TRIM → TAKEOFF
13. PARKING BRAKE → OFF
14. THROTTLE → IDLE
15. PRIMER → LOCKED
16. ENGINE GAUGES → CHECK
17. MAGNETOS → OFF/KEYS OFF
18. FUEL SELECTOR → PROPER TANK





BEFORE ENGINE START FLOW



1. AVIONICS → OFF
2. ENVIRONMENTAL → OFF
3. BREAKERS → ALL IN
4. PANEL LIGHTS → AS REQ.
5. ANTI COLL. LIGHTS → ON.
6. BATT → ON
7. RADIO LIGHTS → AS REQ.
8. NAV LIGHTS → ON
9. CARB HEAT → OFF
10. MIXTURE → FULL LEAN
11. RUDDER TRIM → NEUTRAL
12. FLAPS → UP
13. TRIM → TAKEOFF
14. PARKING BRAKE → ON
15. THROTTLE → 1/4 INCH
16. PRIMER → LOCKED
17. ENGINE GAUGES → CHECK
18. MAGNETOS → OFF/KEYS IN
19. FUEL SELECTOR → PROPER TANK





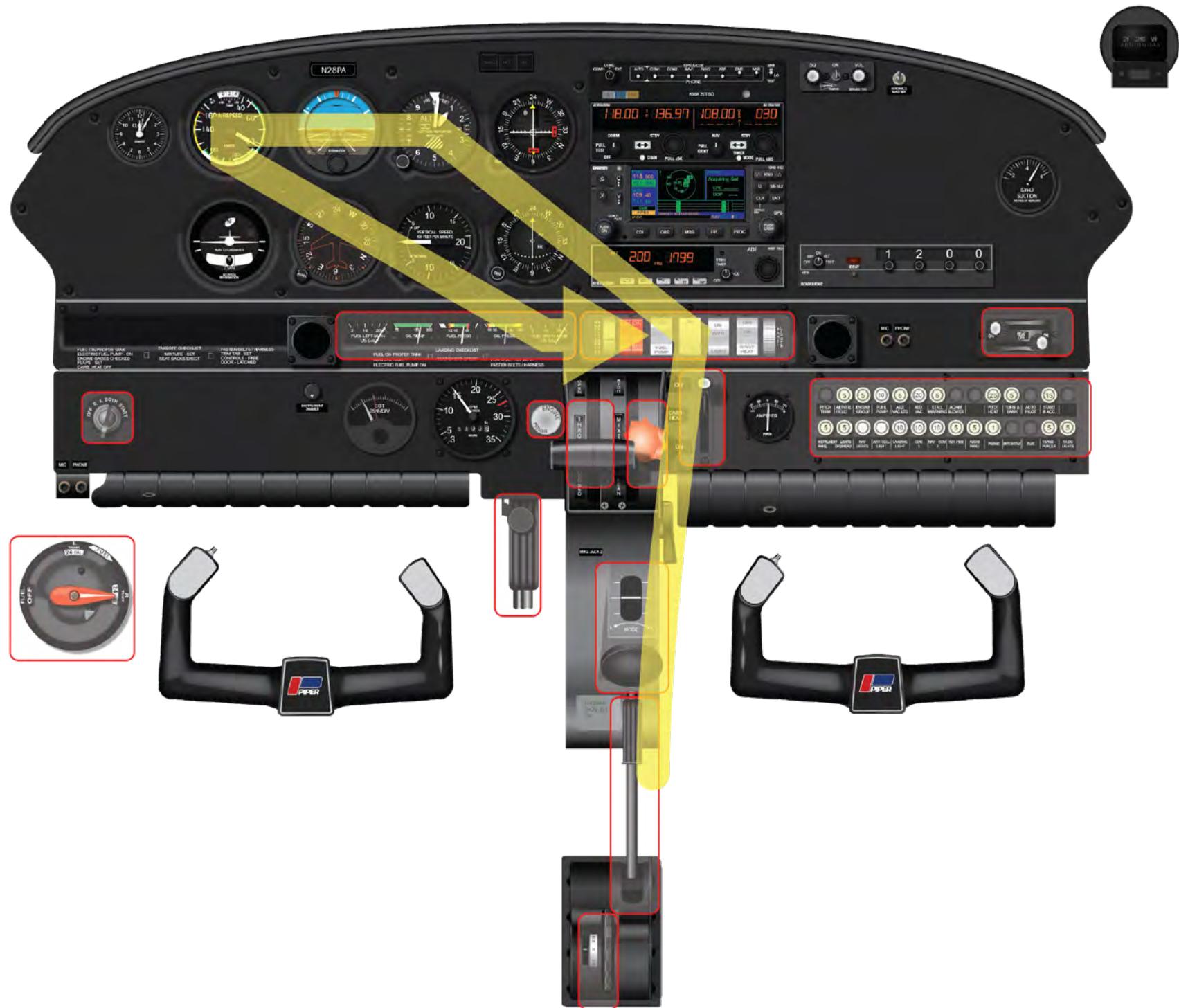
STARTING ENGINE FLOW



1. FUEL PUMP → ON
2. MIXTURE → FULL RICH
3. IGNITION → START
4. THROTTLE → ADJUST
5. ENGINE GAUGES → MONITOR
6. AVIONICS → ON AND SET



AFTER TAKEOFF FLOW



1. SAFE ALTITUDE → FLAPS UP
 2. LANDING LIGHTS → OFF
 3. TAXI LIGHT → OFF
 4. TURNING ALTITUDE → PASS
 5. CLIMBING SPEED → ESTABLISH
 6. CRZ OR TPA → FUEL PUMP OFF





AFTER LANDING FLOW



1. TRIM → NEUTRAL
2. FLAPS → UP
3. MIXTURE → LEAN AS REQ.
4. FUEL PUMP → OFF
5. STROBE LIGHTS → OFF
6. LANDING LIGHTS → OFF
7. TAXI LIGHT → ON



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