

Hovering Maneuvers

Vertical Takeoff to a Hover

- Choose a reference point outside the heli to maintain a constant ground track.
- Trim the controls in the neutral position. Clear L/R and above.
- Establish the hover scan and smoothly raise the collective until light on the skids. (tendency to drift and turn to the right)
- Stabilize momentarily, trim out control pressures.



- Keep applying smooth, slow, upward pressure on the collective pitch
- As the heli leaves the ground, eliminate drift with cyclic for equilibrium, and maintain a constant heading with the pedals.

- Continue to raise the collective until reaching hover altitude (3 Feet). Trim out control pressures.



Note: In a no-wind condition, it will be necessary to displace the cyclic to the left to overcome the anti-torque thrust from the tail rotor and prevent the aircraft from drifting right. Because of this, the helicopter will take off right skid first and land left skid first.

Vertical Landing From a Hover

- Smoothly lower the collective to begin a slow rate of descent.
- Use pedals to maintain heading and cyclic to eliminate drift. Constantly cross check all visual reference points.

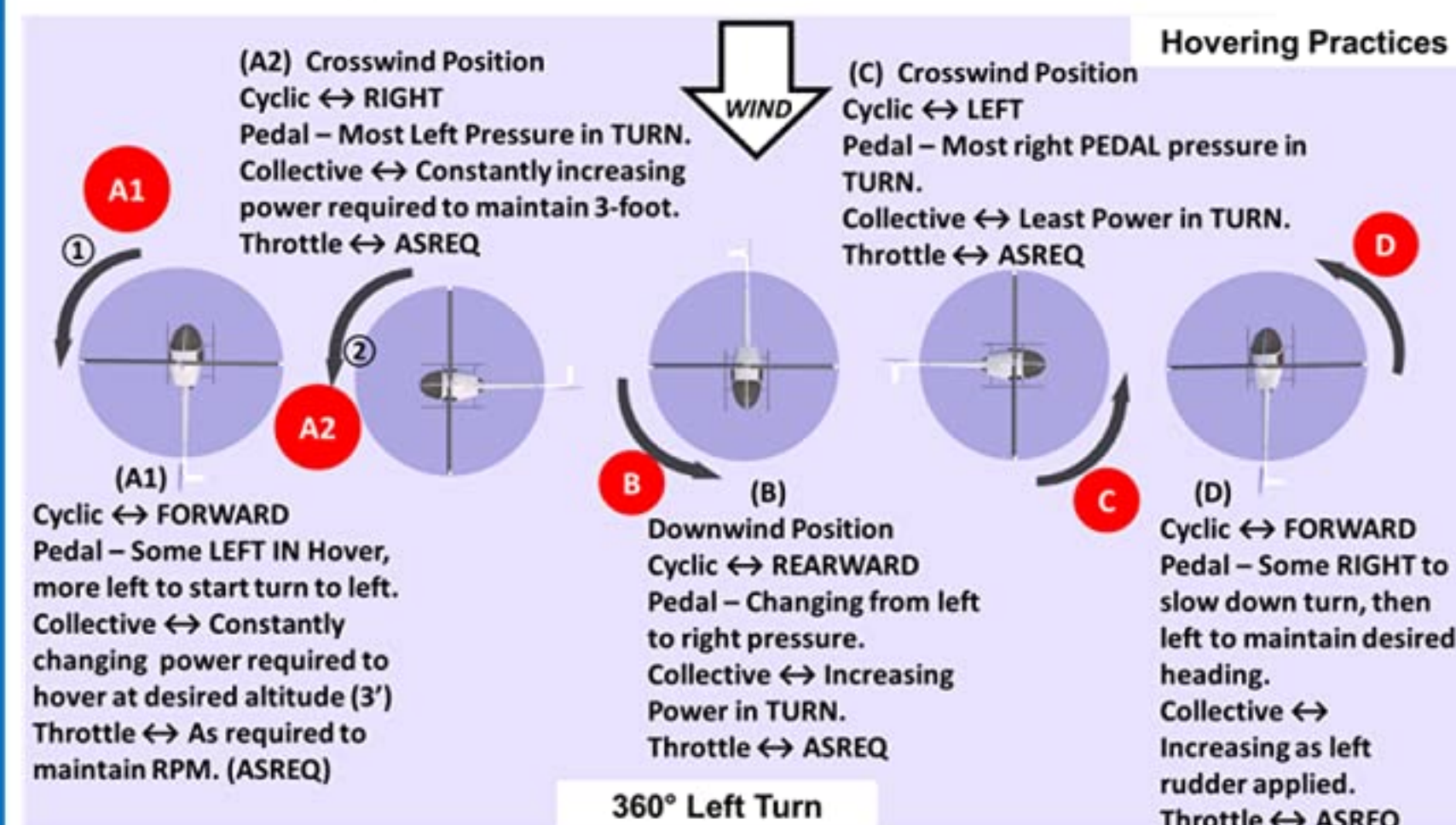


- The rate of descent may slow & stop as the heli approaches the ground. (Why?)
- Continue the descent with slight collective pressure until the skids come into contact with the ground.

- When on the ground, smoothly lower the collective to the full down position.
- Make sure weight is fully transferred from the rotor to the skids. No slide and drift over ground.
- Trim the controls in the neutral position (In a no-wind condition)



Note: A series of small corrections are better than one large correction (No over control on collective & cyclic). Make smooth and timely corrections. Do not attempt to lower the collective rapidly after the skids are on the ground. The heli will land left skid first.



✓ The Pilot In Command (PIC) Must Ensure The Aircraft Is Operated In Accordance With The Approved Aircraft Flight Manual (AFM) At All Times.

Hover Taxi / Air Taxi / Surface Taxi

- From a hover, displace the cyclic in the desired direction of movement.
- Hover Taxi: Speed less than approx. 20 Knots, 25 feet AGL.
- Air Taxi speed more than 20 Knots, below 100 feet AGL for greater distances within airport or heliport boundary. (Varying airspeed and altitude combination)
- Surface Taxi for those helicopters with landing gear of the wheeled type for less rotor downwash. Speed not faster than a brisk walk.



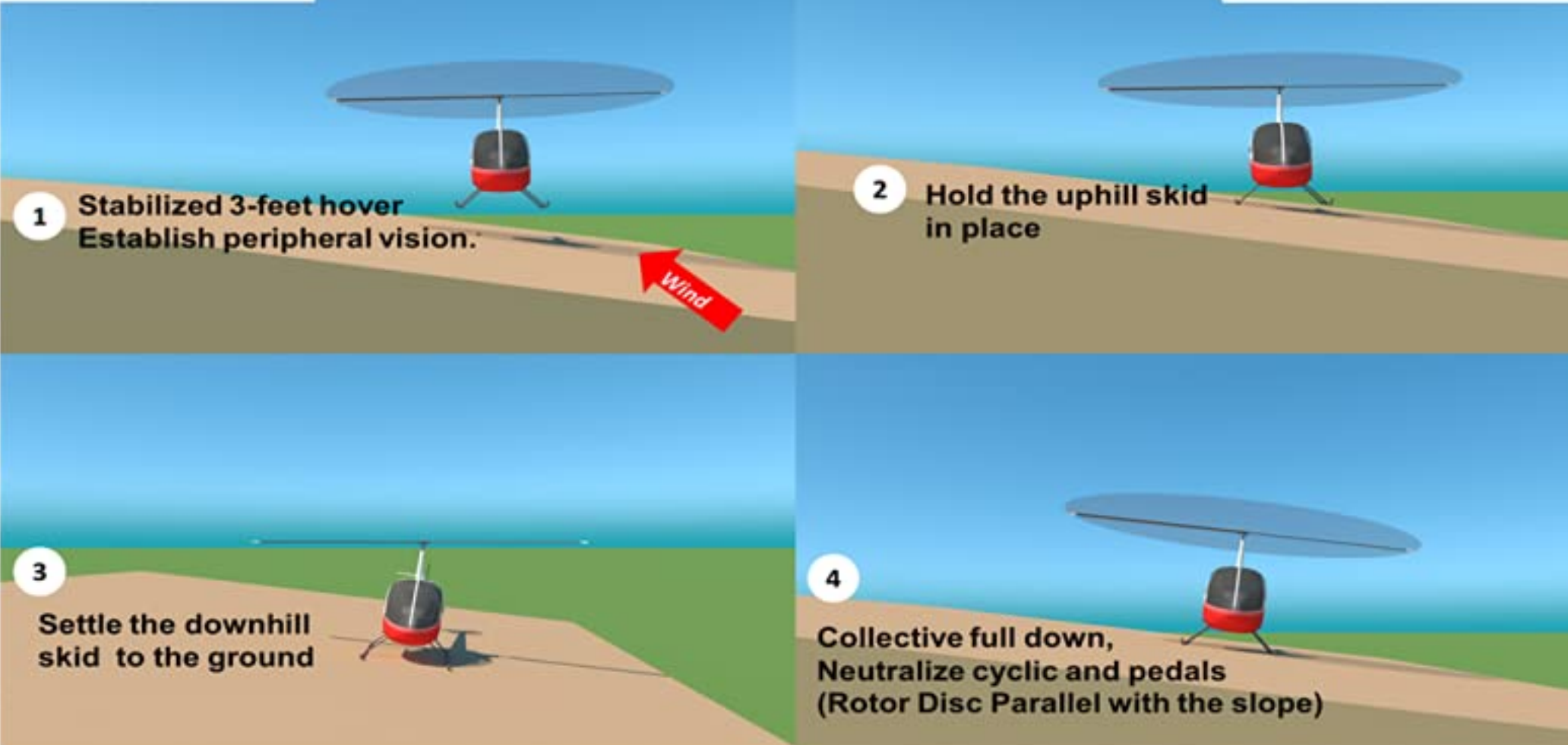
- Utilize pedals to maintain heading, collective to maintain altitude, and the cyclic to maintain the desired rate of movement.
- If you have a crosswind, apply lateral cyclic into the wind to maintain ground track.

- A combination of collective pitch and cyclic governs starting, stopping, and rate of speed while taxiing.



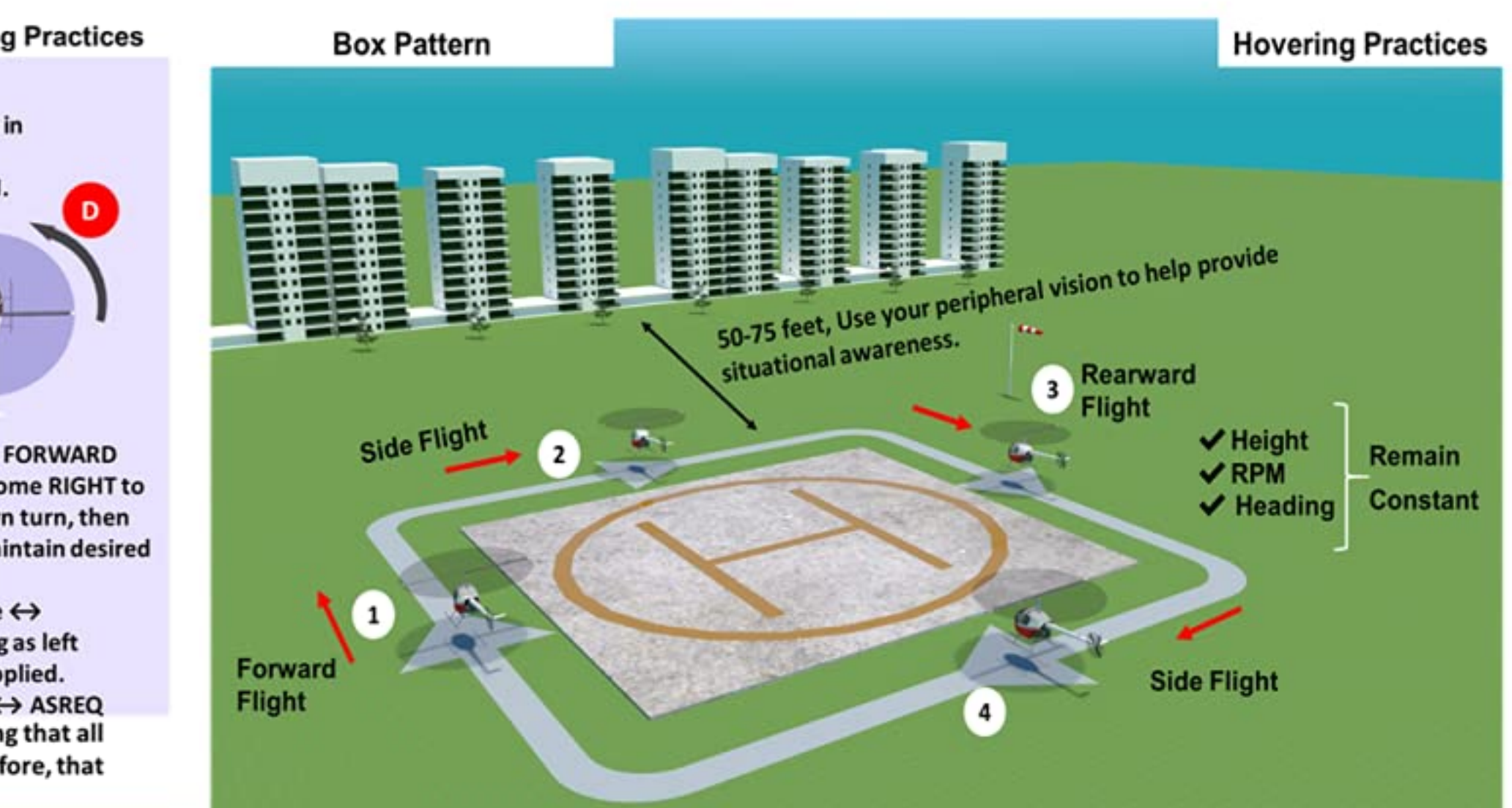
Safety Note: Hover taxiing shall be conducted at a reasonable rate of speed such that a safe landing can be accomplished in the event of a loss of power.

Slope Operations



- Approach the slope at 45° angle, over the slope, execute a slow pedal turn to position the helicopter parallel with slope at 3 feet.
- Slowly & Slightly downward pressure on the collective starts the helicopter descending. As the upslope skid or wheel touches the ground, hesitate momentarily in a level attitude, then apply lateral (right) cyclic in the direction of the slope.
- While holding the uphill skid in place, continue lowering the downslope skid with the collective. As you lower collective, continue to move the cyclic towards the slope to maintain a fixed position on the surface.
- After the downhill skid is on the surface, reduce the collective to the full down position, and neutralize the cyclic and pedals.

Note: * A slope takeoff is basically the reverse of a slope landing.
** Landing with the helicopter facing down the slope (downhill) is not recommended because of the high probability of striking the tail rotor & tail rotor skid on the surface.



Note: During the hover practices, it is free to oscillate either longitudinally or laterally in the same way as a pendulum. Avoid exaggerating 'Pendular Action' by overcontrolling.

HELICOPTER VISUALIZED FLIGHT MANEUVERS

Normal Takeoff From A Hover

- Doors Latched, Governor On, RPM Stabilized
- Maintain a stationary hover, 3 Feet, Read MP
- Make a clearing turn & Takeoff Clearance.
- Ease the cyclic forward to initiate forward movement.
- Increase (raise) collective sufficiently to maintain hover altitude and prevent the helicopter from sinking.
- As effective translational lift is achieved (Nose will tend to rise), the helicopter begins to climb, smoothly apply forward cyclic, Reposition Cyclic & Rudder
- Accelerate to Climb Speed
- Set climb power and the best rate of climb speed's attitude. See POH/AFM
- Climb the desired altitude safely and expeditiously.

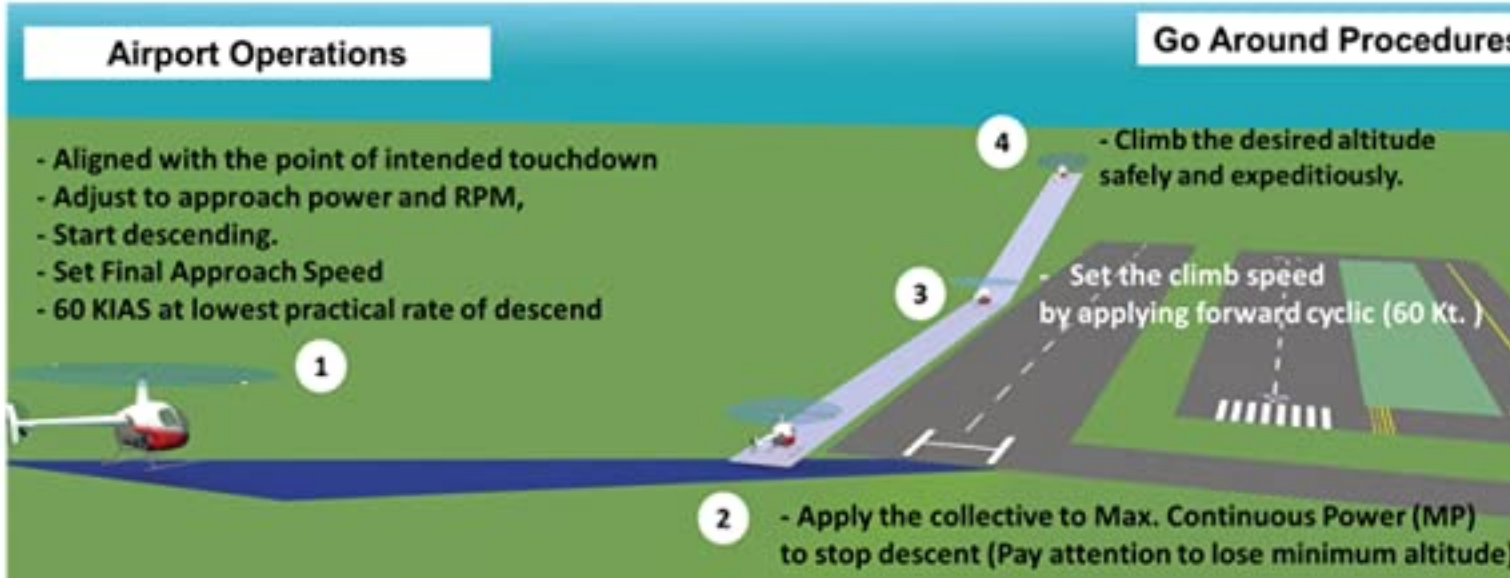
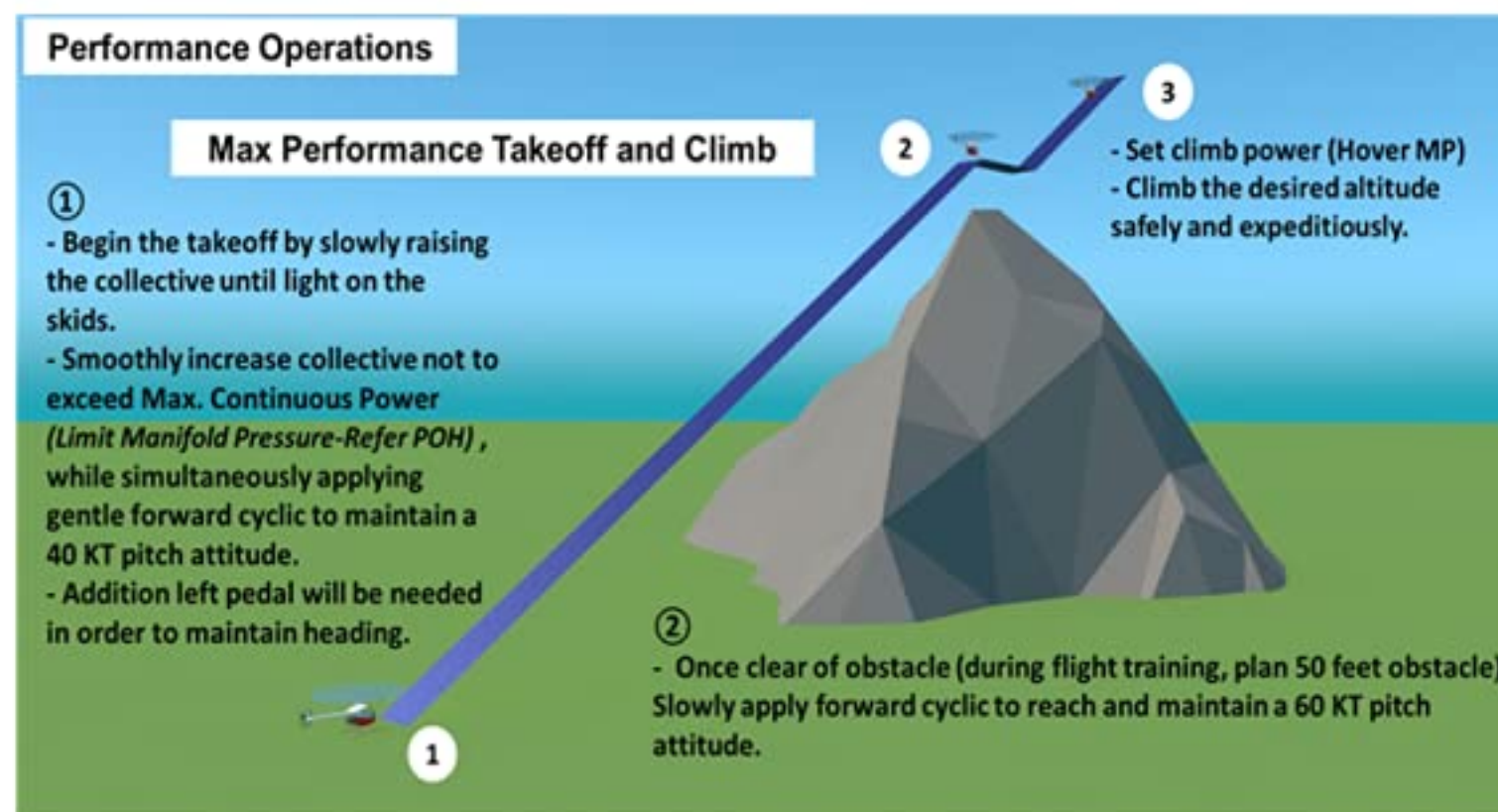
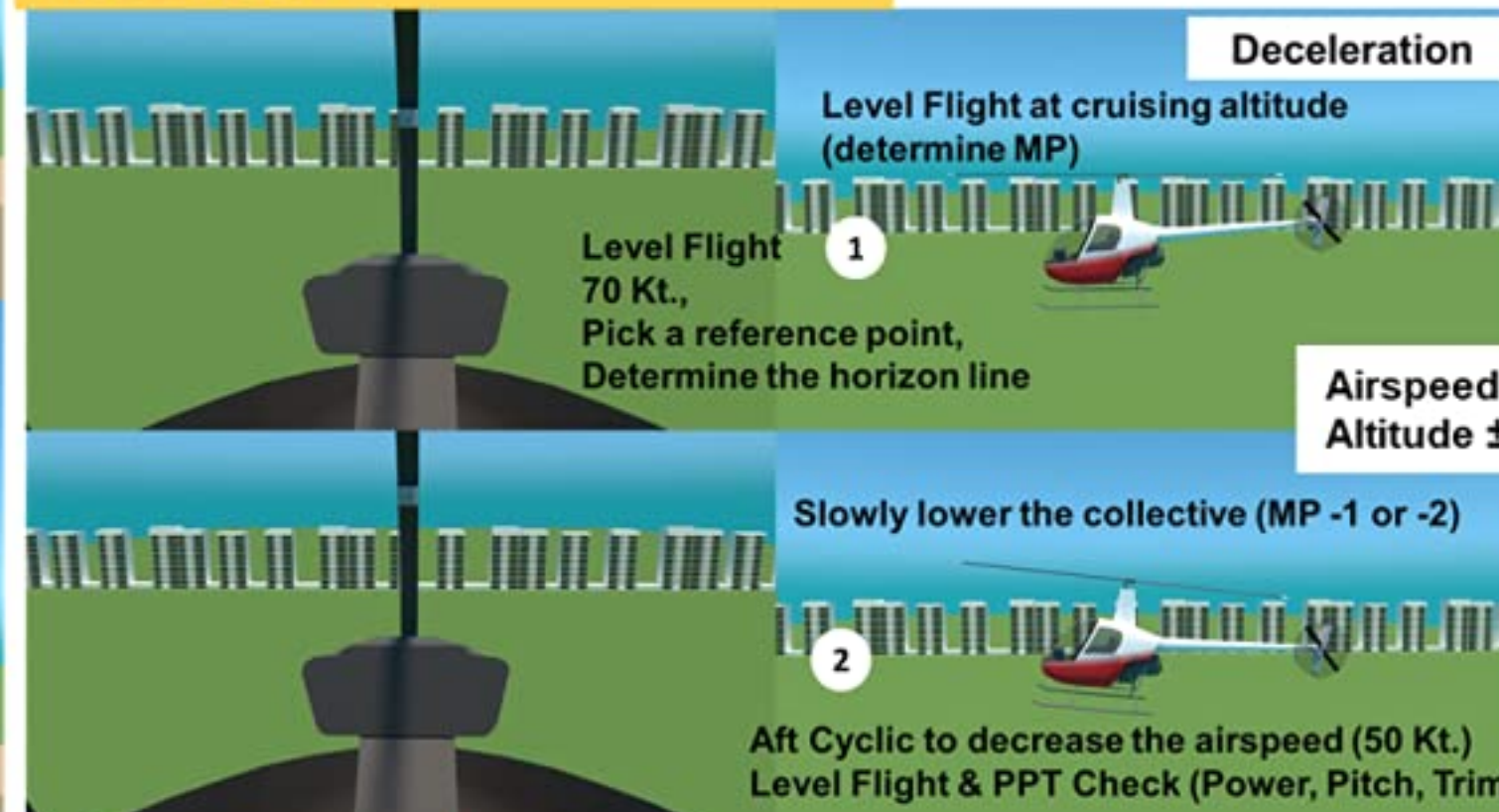
Note: If the takeoff is made during crosswind conditions, the helicopter is flown in a slip during the early stages of the maneuver. The cyclic is held into the wind a sufficient amount to maintain the desired ground track for the takeoff.

- Approach & Landing Clearance, (3-5 Miles away)
- Aligned with the point of intended touchdown
- Adjust to approach power and RPM, Start descending.
- Set Final Approach Speed
- 60 KIAS at lowest practical rate of descent
- Approx. approach angle of 10°
- Keep reducing airspeed.
- Height and speed reduction
- As the helicopter approaches the ground (50 feet of altitude), Reposition Cyclic & Rudder to keep control of ground speed and descent rate.
- Increase collective as translational lift is lost to maintain approach angle.
- 3 feet, helicopter facing into the wind if possible.
- Make final power adjustments.

Note: Initially at 60 KTS and 300 feet AGL, Be sure rate of descent is less than 300 FPM before airspeed is reduced 30 KIAS. Prior to landing, Refer to Landing Checklist & the area must be checked to ensure if it is free of obstacles and the landing surface is suitable.

Normal Approach To A Hover

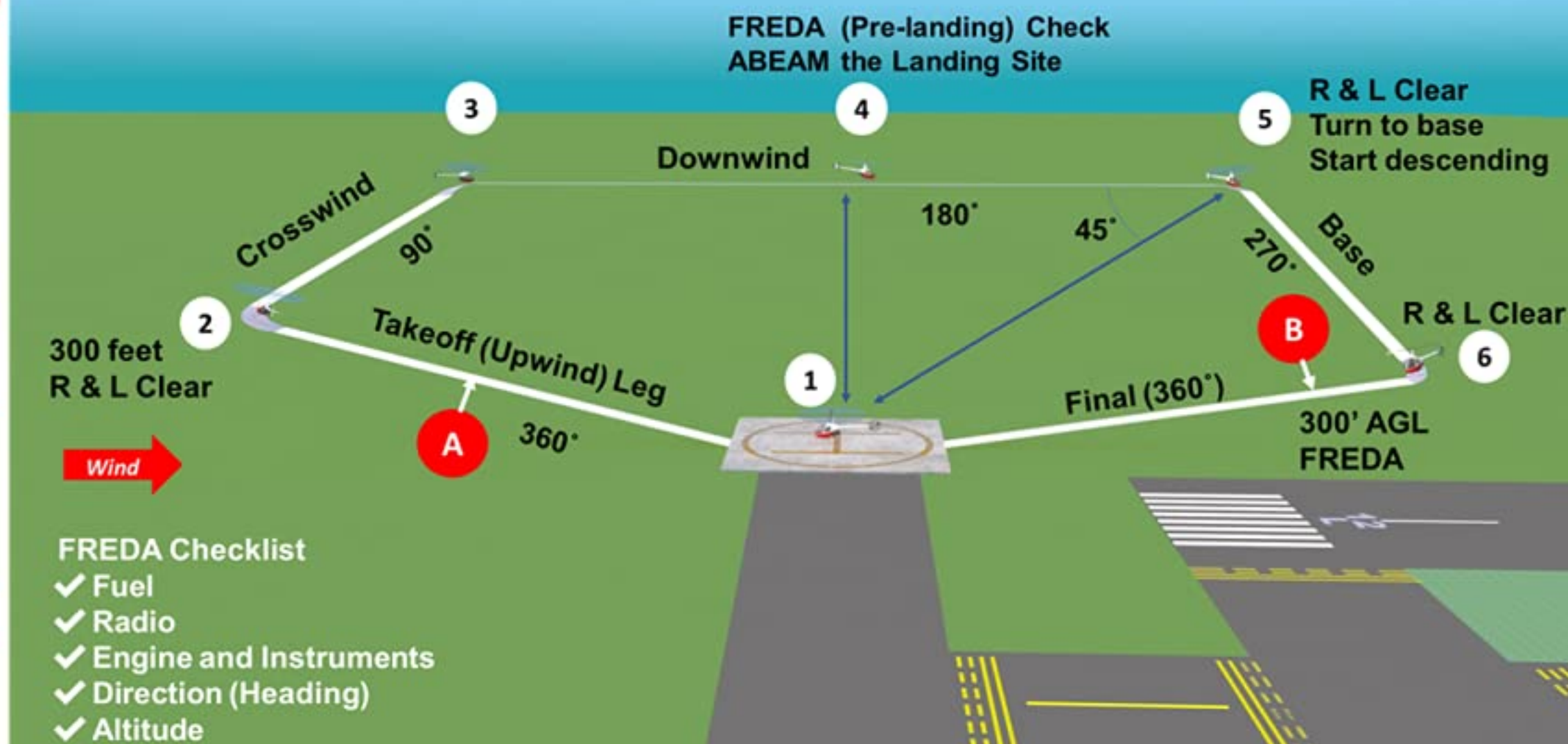
Takeoff Check: Call Out : Rotor RPM 104 % , Lights OUT, Engine Instruments Green, FUEL OK, Hover Manifold Pressure 22.9



Safety Note: "If you are not stabilized on approach (glidepath, speed, wind shear etc.), Do not get focused on recovering a deteriorating situation – GO AROUND".

Note: * Governor is inactive below 80 % engine RPM regardless of governor switch position.
** During the autorotation practice, always roll the throttle off smoothly for small visible needle split.

Airport/Heliport Operations



(1) Make sure you complete a clearing turns, listen carefully all traffic pattern communications to build up a situational awareness of any other aircraft in the area.

Number 1 to A Point: Apply 'Normal Takeoff from A Hover' procedure,

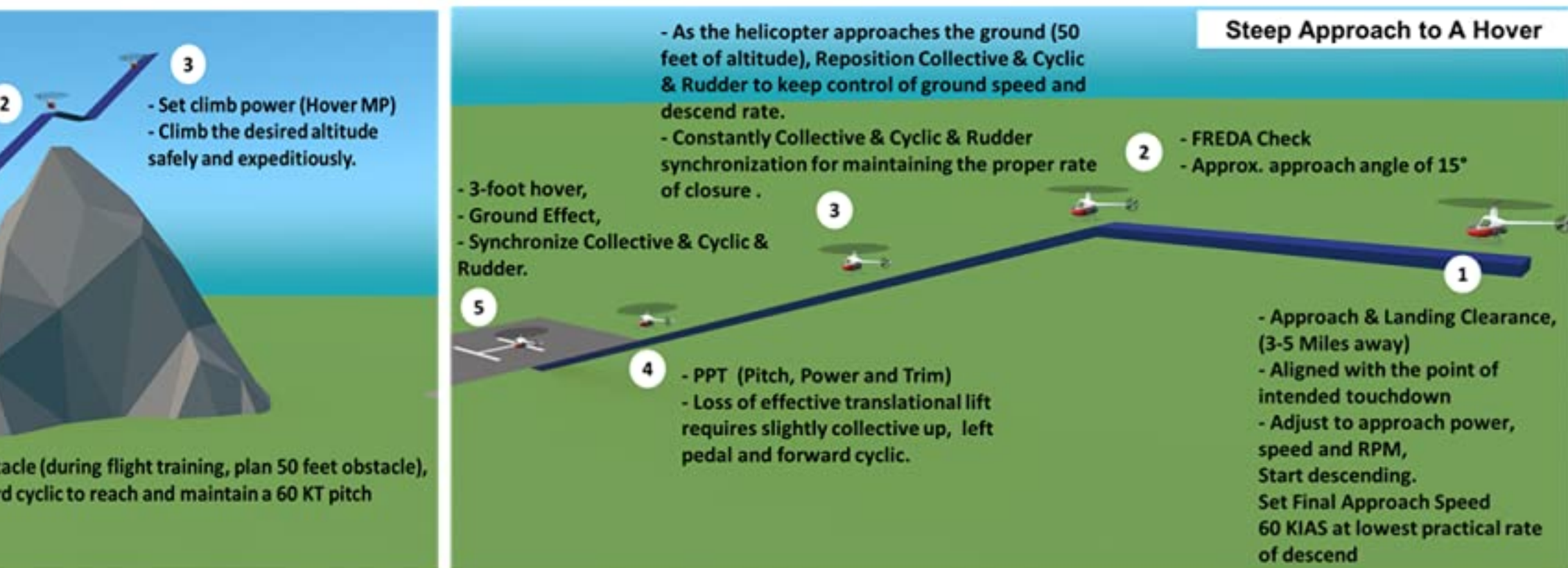
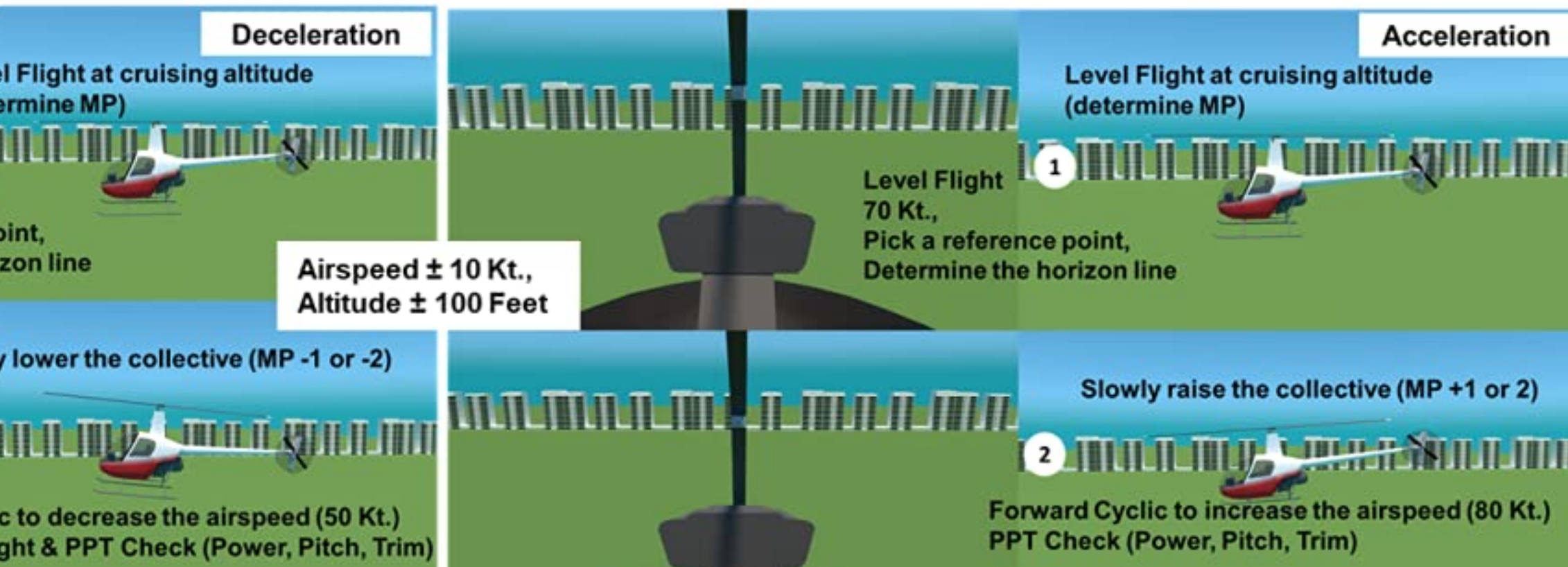
(2-3) After passing the departure end of the runway when you are at a recommended safe altitude (Nu.2 -300' AGL to turn to the crosswind, not exceed 30°-45° bank angle). Once You approach the Traffic Pattern Altitude (500 feet AGL), high probability immediately prior to Nu.3 point, Level the helicopter at 500' (70-80 Knots), PPT Check (Power-Pitch-Trim).

(4-5) Downwind Leg: Straight and level flight at 500 feet AGL and 70 to 80 Kt., Once You are ABEAM the landing site (Point 4), Perform FREDa Check (Fuel, Radio, Engine and Instruments, Direction and Altitude), Nu.5 is the turning point to BASE, while turning to BASE heading (270°), lower the collective for descending 300' AGL on BASE Leg., Call out 'VSI positive rate of descent', not more than 500 FPM. On base leg, Keep constantly eye contact with landing site to decide the turning point from base to final.

(6) Turning Point to Final, Strong crosswinds may require more bank, Slow the aircraft down to 60 knots. Fly straight and level at 300 feet and 60 knots until you have a good site picture (Approx. approach angle of 10°)

(B) FREDa Check and Apply 'Normal Landing to A Hover' procedure.

Note: Traffic Pattern covers a lot of the flight exercises. e.g. hovering, spot turns, side flight, transitions, climbing, climbing turns, straight and level flight, descent to master the handling of the helicopter.



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