

ABS Flight Instructor Academy

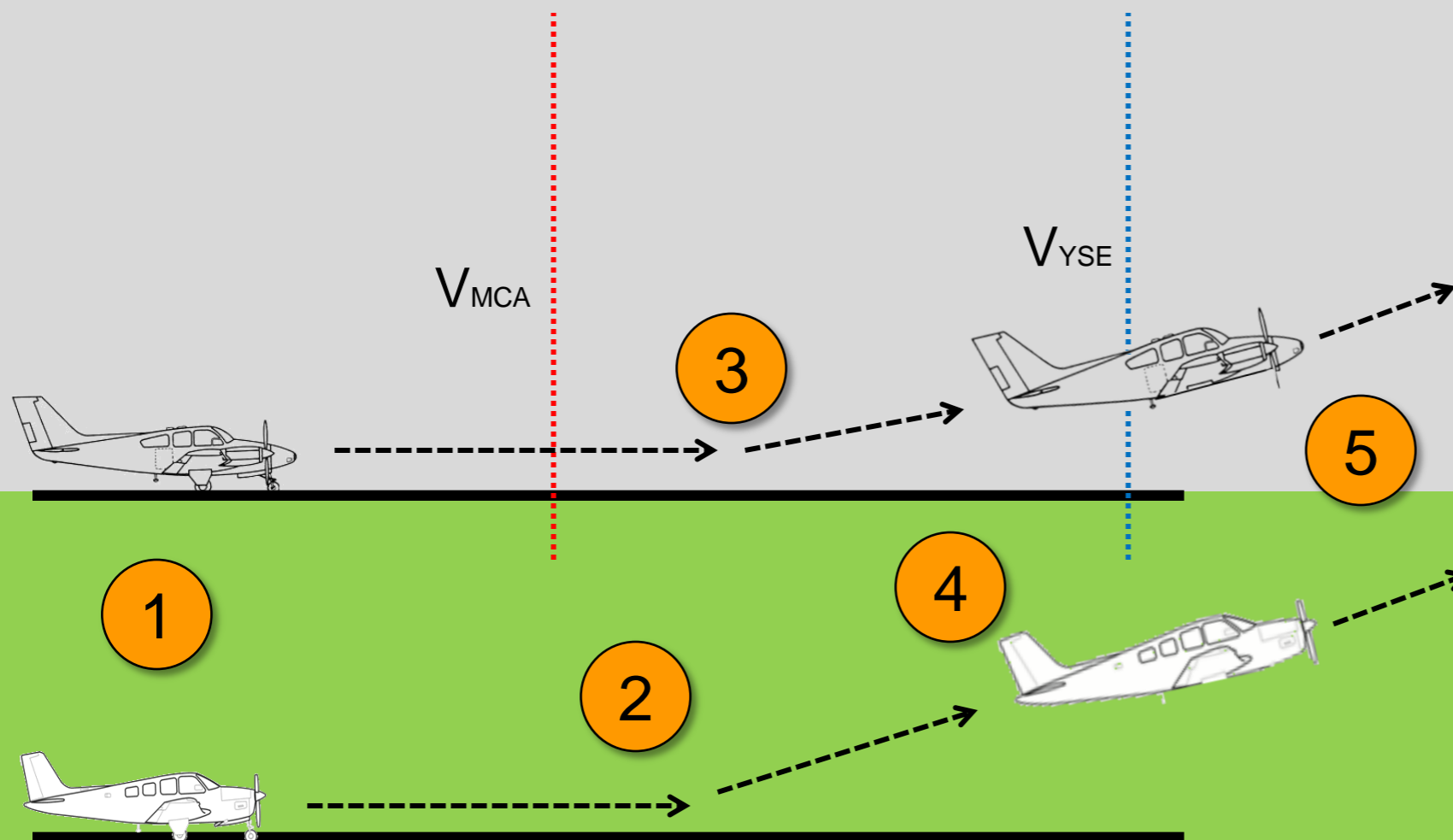
Maneuvers Profiles

January 2013



AMERICAN
BONANZA
SOCIETY

Normal Takeoff



1

- Elevator trim setting varies with cabin load, per POH
- Takeoff trim is set for V_Y at full power
- Full power including mixture as required

2

Bonanza/Debonair

- Establish initial climb attitude ($+7^\circ$) 3-4 knots prior to POH liftoff speed
- Reduce attitude slightly at high density altitudes

3

Baron/Travel Air

- Establish slight climb attitude at POH liftoff speed
- Accelerate to blue line speed as quickly as possible, then adjust attitude to ($+7^\circ$) to maintain at least blue line +10 knots for initial climb

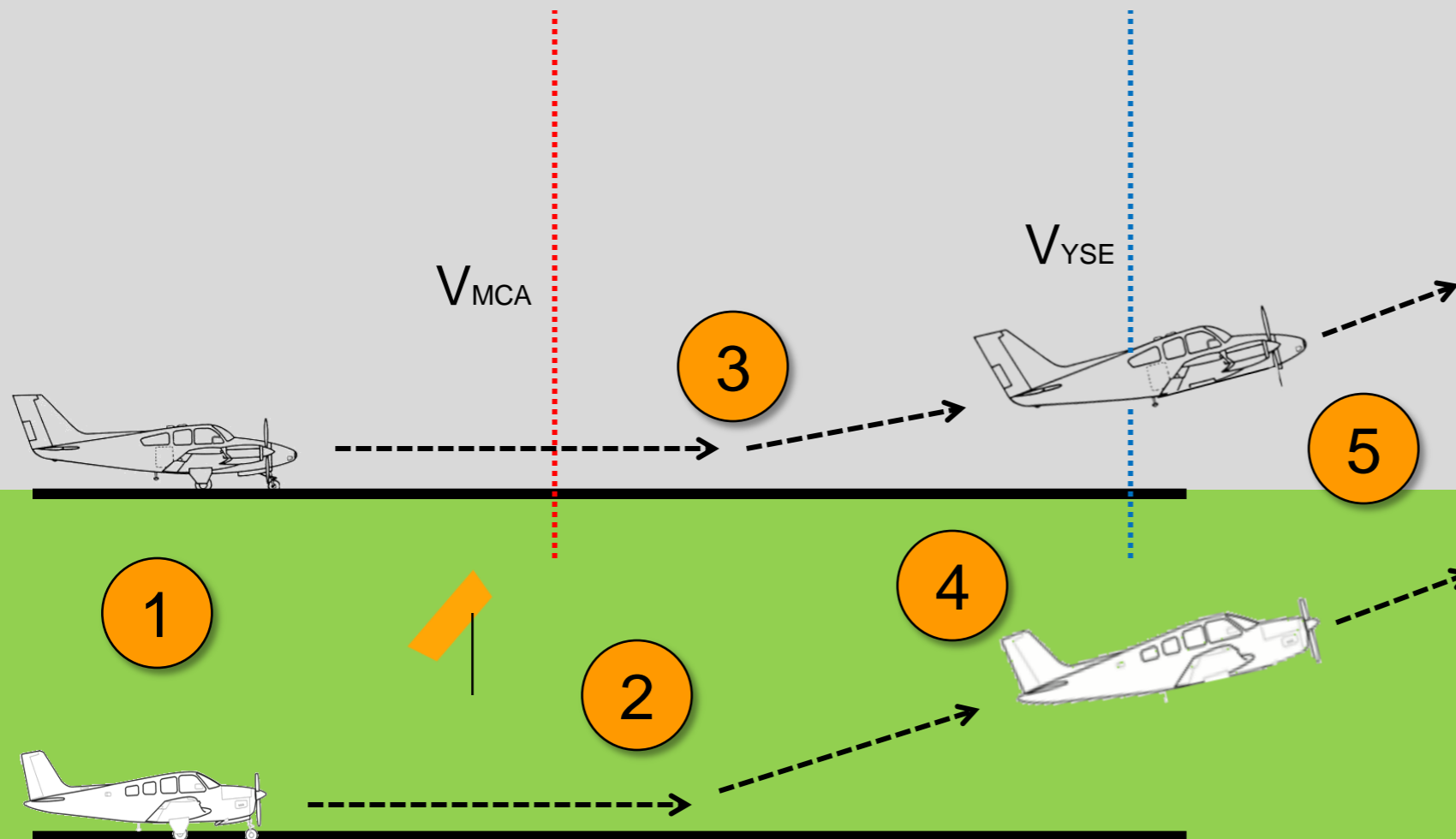
4

- Verify a positive rate of climb
- Retract landing gear

5

- Adjust to cruise climb at 800-1000 ft AGL
- You may adjust RPM earlier for noise abatement with very little degradation in climb

Crosswind Takeoff



1

- Elevator trim setting varies with cabin load, per POH
- Takeoff trim is set for V_Y at full power
- Full power including mixture as required
- Aileron into wind as required

2

Bonanza/Debonair

- Establish initial climb attitude ($+7^\circ$) 5 knots above the POH liftoff speed
- Reduce attitude slightly at high density altitudes

3

Baron/Travel Air

- Establish slight climb attitude at 5 knots above POH liftoff speed
- Accelerate to blue line speed as quickly as possible, then adjust attitude to ($+7^\circ$) to maintain at least blue line +10 knots for initial climb

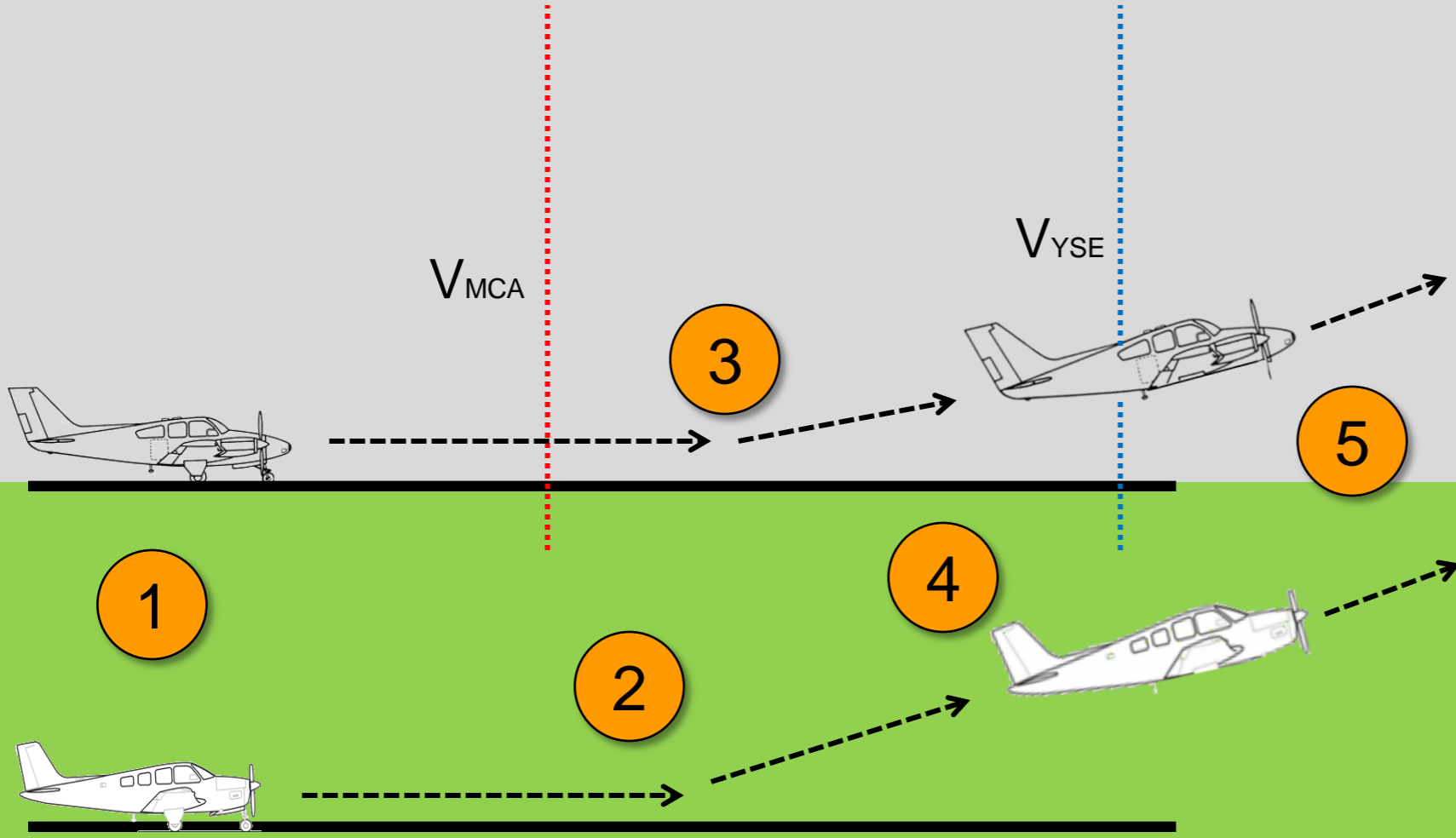
4

- Verify a positive rate of climb
- Retract landing gear

5

- Adjust to cruise climb at 800-1000 ft AGL
- You may adjust RPM earlier for noise abatement with very little degradation in climb

Short Field Takeoff



1

- Elevator trim setting varies with cabin load, per POH
- Takeoff trim is set for V_Y at full power
- Full power including mixture as required before brake release

2

- Bonanza/Debonair**
- Optional: APPROACH or 20° flaps
 - Establish V_x attitude (+10° flaps up, +12° using flaps) 5 knots prior to POH liftoff speed
 - Reduce attitude slightly at high density altitudes

3

- Baron/Travel Air**
- Flaps up
 - Establish slight climb attitude at POH liftoff speed
 - After clearing obstacles, adjust attitude to (+7°) to maintain at least blue line +10 knots for initial climb

4

- Verify a positive rate of climb
- Retract landing gear
- Retract flaps if used

5

- Adjust to cruise climb at 800-1000 ft AGL
- You may adjust RPM earlier for noise abatement with very little degradation in climb

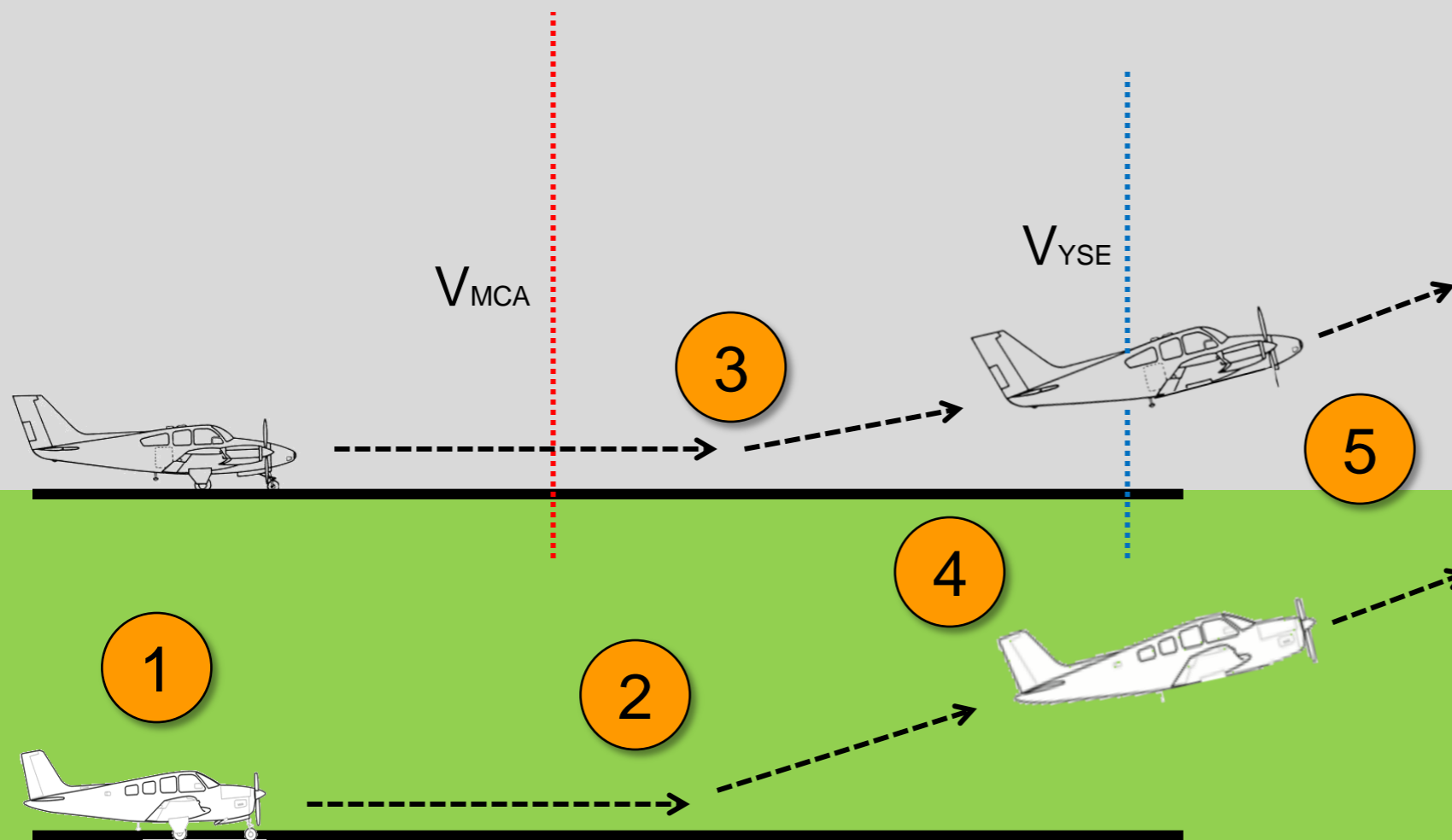
• **BPPP Limitation:** Maximum crosswind 10 knots

• Engine failure warning:

- **Bonanza/Debonair:** PUSH to -5° attitude
- **Baron/Travel Air:** PUSH to +3° attitude



Soft Field Takeoff



- Beech provides no guidance
 - Use *Airplane Flying Handbook* soft field technique
 - Full power including mixture as required
 - Keep nosewheel slightly off the surface throughout takeoff roll
- Bonanza/Debonair**
 - Optional: APPROACH or 20° flaps
 - Lift off into ground effect when able
 - Reduce attitude to remain in ground effect
 - Accelerate to Normal Takeoff liftoff speed
- Baron/Travel Air**
 - Flaps up
 - Lift off into ground effect when able
 - Reduce attitude to remain in ground effect
 - Accelerate to Normal Takeoff liftoff speed
- Transition to Normal Takeoff profile
- Verify a positive rate of climb
 - Retract landing gear
 - Retract flaps if used

• BPPP Limitations:

- Minimum runway width: 100 feet
- Maximum crosswind 10 knots

• Type-specific warnings:

- **Baron/Travel Air:** Liftoff into ground effect is at less than V_{MCA} speed. Any loss of power will result in loss of directional control and require immediate power OFF for both engines
- **B36TC:** May lift off into ground effect below a speed that provides sufficient control authority to prevent drift
- **BPPP recommends against soft-field takeoffs in Barons, Travel Airs and B36TC Bonanzas for these reasons.**

Cruise Climb



1

Climb at an indicated airspeed 15-20 knots higher than in the POH unless obstacles or traffic require

2

- Monitor CHTs and oil temperature closely
 - Target maximum 380°F/195°C
 - E-Series: Target maximum 420°F
- Increase indicated airspeed or “step climb” with intervening level-offs if needed for cylinder and/or oil cooling

3

Cowl flaps fully OPEN in airplanes equipped with cowl flaps

4

Mixture:

- Lean for altitude per altitude brackets on fuel flow gauge
- Turbocharged and IO-550s with altitude compensating fuel pumps:
 - Mixture: FULL RICH
 - Fuel flow: MONITOR using fuel flow tables in POH

5

Auxiliary boost pump(s): LOW in airplanes so equipped, if CHTs exceed target values and/or if fuel flow fluctuations occur



Level-Off and Cruise



1

- Transition to level flight
- Cowl flaps CLOSED, in cowl flap-equipped airplanes
- Allow the airplane to accelerate to cruise speed
- Set desired cruise power

2

Gradually trim nose down as the airplane accelerates

3

After engine temperatures stabilize, lean the mixture:

- Find peak EGT (peak TIT in turbocharged airplanes)
- Lean LEAN or RICH of peak EGT/TIT as required/desired

4

Monitor CHTs:

- If maximum CHT exceeds 380°F/195° (420°F in E-Series engines):
 - If LEAN OF PEAK, lean further to cool CHTs
 - If RICH OF PEAK, enrichen further to cool CHTs

5

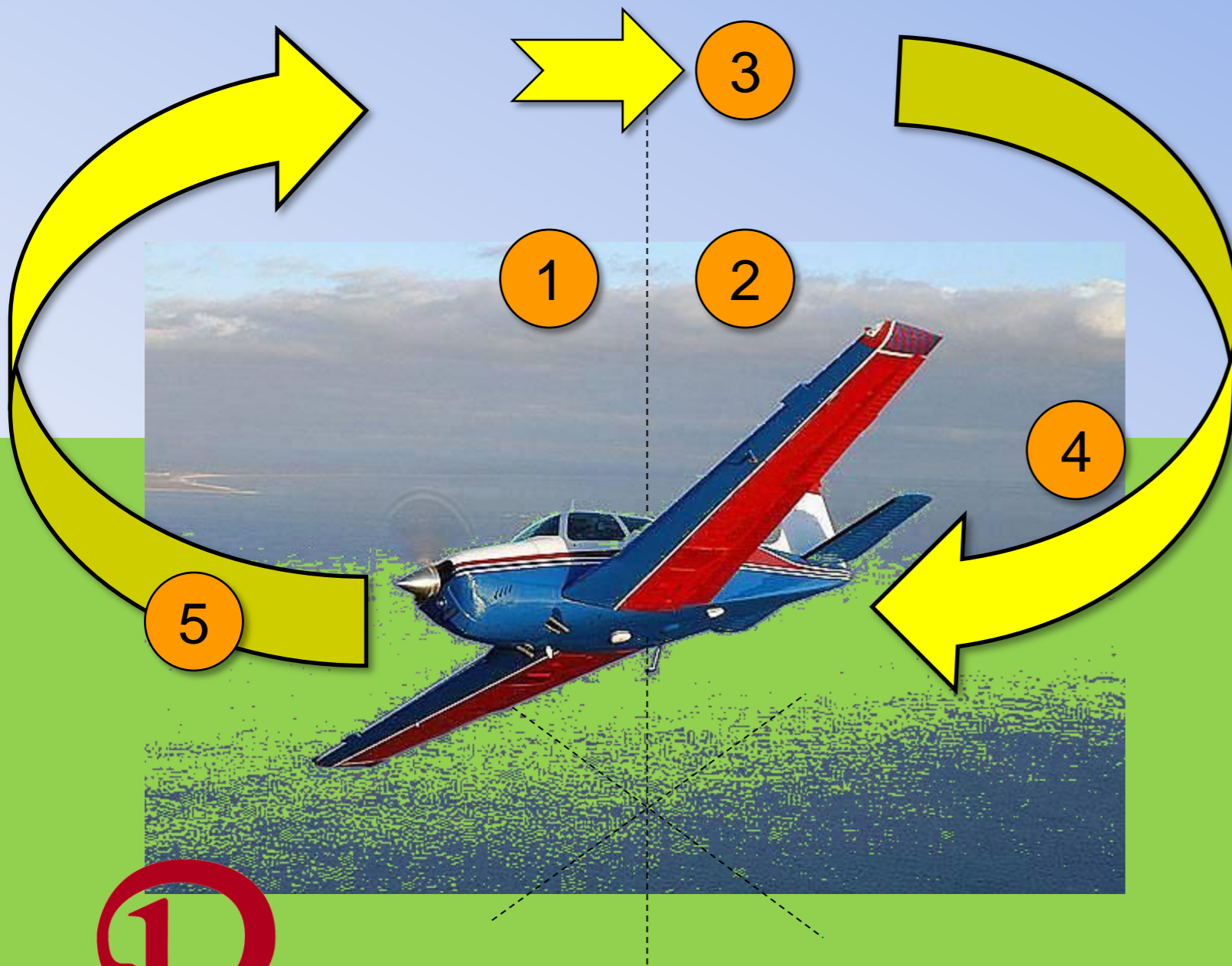
Monitor fuel burn and flow rates against flight planning expectations



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Steep Turns



1

- Use FAA *Airplane Flying Handbook* technique and Practical Test Standards completion criteria
- Complete at least one full 360° turn in each direction
- Practice both:
 - Private standards (45° bank $\pm 5^\circ$) turns
 - Commercial standard (55° bank $\pm 5^\circ$) turns

2

- Emphasize accuracy, rudder coordination and looking outside the airplane

3

- Entry speed:
 - 120 KIAS (Bonanza/Debonair)
 - 140 KIAS (Baron/Travel Air)
- Begin at Approach – Level power setting with flaps and gear up
- Additional power will be required to maintain airspeed in the turn

4

- Significant back pressure will be required to hold altitude, especially in the 55° bank turn
- Maintaining coordinated flight requires more rudder than most Beech pilots normally use

5

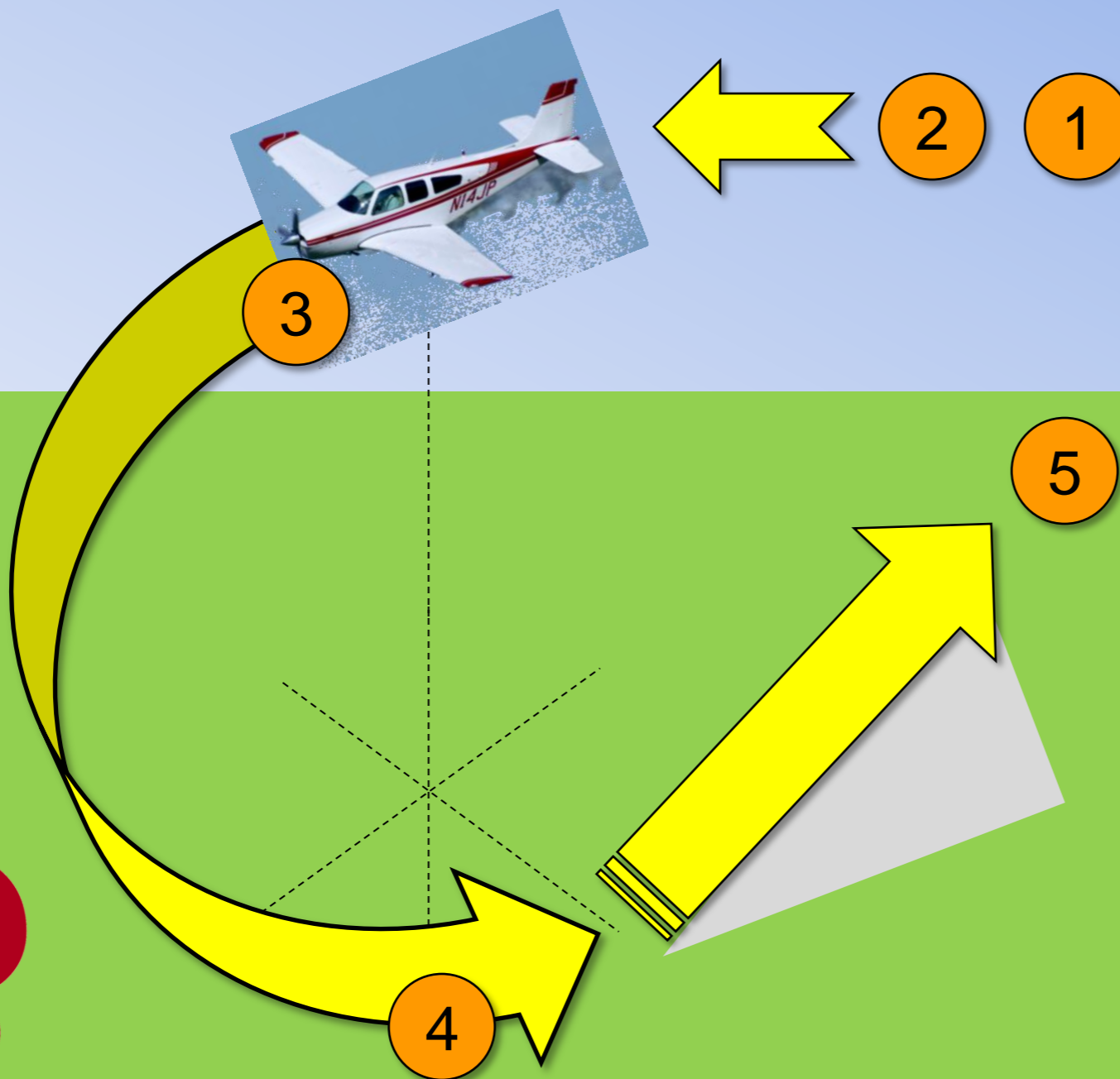
- Point out tendency to enter a spiral if altitude and airspeed are not maintained
- The spiral tendency is greater in a left turn due to propeller left turning tendencies



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Spiral Demonstration



1

- Begin from at least 3000 ft AGL
- Entry speed:
 - 100 KIAS (Bonanza/Debonair)
 - 120 KIAS (Baron/Travel Air)

2

- Demonstrate positive stability in pitch and yaw
- Brief the neutral to slightly negative stability in roll

3

- Enter a steep bank but provide no back pressure
- Allow airspeed and bank to increase as the nose pitches downward

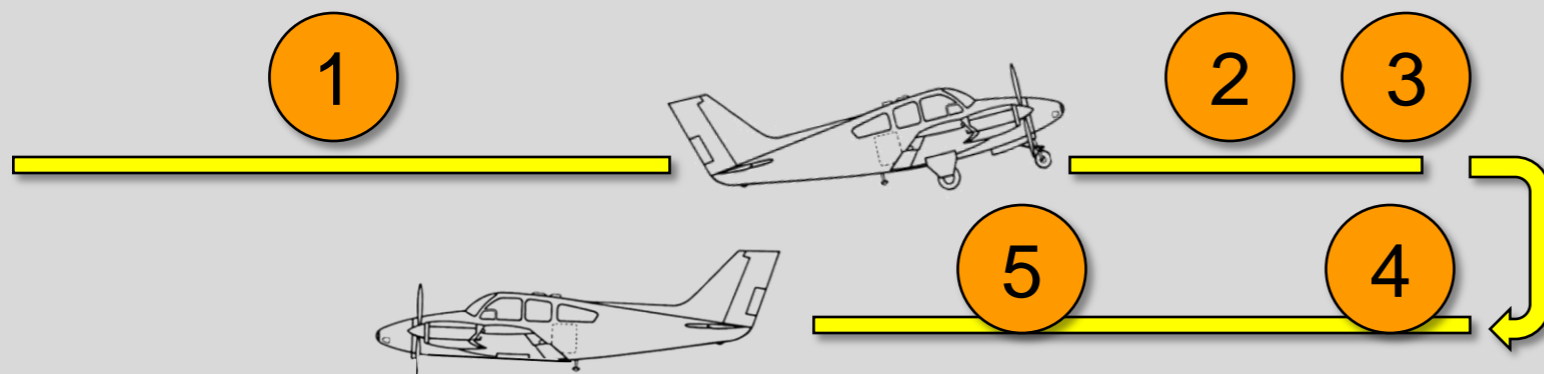
4

- Recover at V_A or 60° bank, whichever occurs **first**
- Throttle(s) IDLE, wings LEVEL
- Permit the nose to rise to the climb attitude
- Apply FORWARD control pressure as needed to prevent the nose from rising too steeply

5

- Discuss the speed, vertical speed and G-load that might result from a spiral entry from cruise flight
- Discuss extending landing gear if airspeed enters the yellow arc in an actual emergency

Slow Flight



1

- Enter from cruise speed
- Manifold pressure 12" to 14"
- Cowl flaps OPEN (if equipped)
- Mixture(s) FULL RICH
- Landing gear DOWN
- Flaps FULL

2

- Airspeed:
 - 70-75 knots (Bonanza/Debonair)
 - $V_{MCA} + 10$ knots (Baron/Travel Air)

3

- Add power to hold altitude
 - MDA Level PAC +2"MP or as needed
- Pitch controls airspeed, power controls altitude
- Requires significant right rudder, even in turns to the left

4

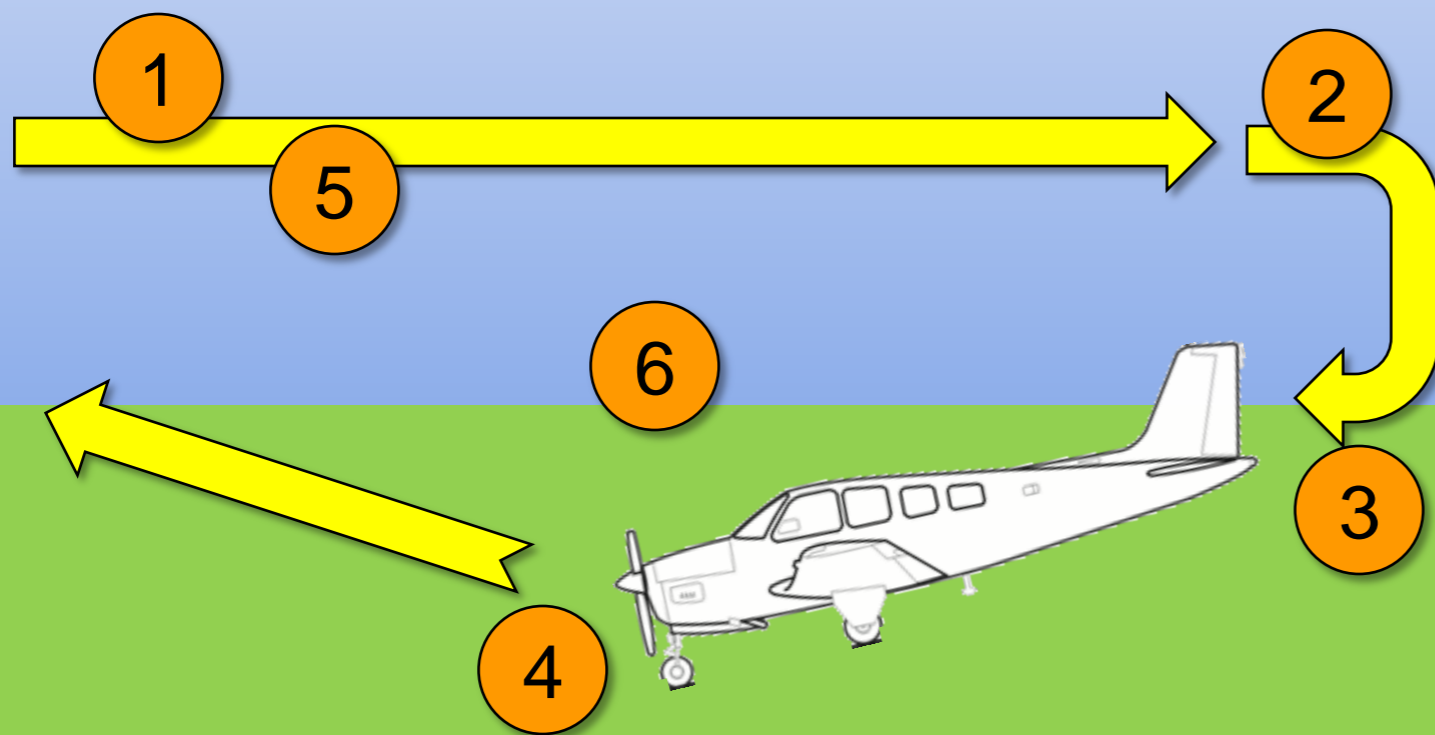
- Make turns to headings
- Make constant rate climbs and descents as time permits
- Recover at a constant altitude

5

- Pay close attention to CHTs and oil temperature throughout the maneuver
- Recover whenever CHTs or oil temperature require



Power-Off/ Approach Stall

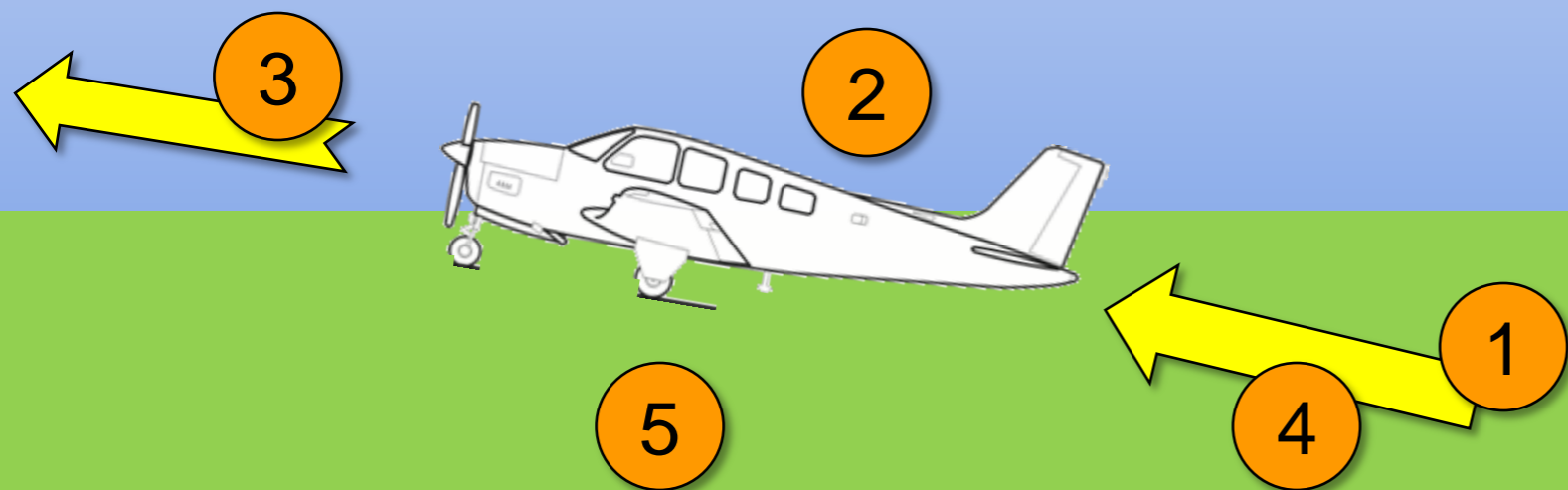


BPPP Limitations:

- Do not perform stalls with fuel in tip tanks
- Do not perform stalls with more than one person in the rear seats

- 1** Enter with:
 - Power 15" MP
 - Mixture(s) FULL RICH
 - Gear DOWN
 - Flaps DOWN
- 2** Reaching final approach speed:
 - Establish final approach attitude
 - Power 10-11" MP
 - Wings level, coordinated flight
- 3**
 - Gradually increase back pressure to stall
 - Level wings as necessary with rudder, not aileron
- 4**
 - Initially recover without power, to demonstrate lift is generated by angle of attack
 - Recover to a climb attitude with power in coordinated flight
 - Maintain neutral ailerons
 - Retract FLAPS, then GEAR
- 5**
 - Repeat with power application at the beginning of recovery
 - Repeat using 25° bank and Approach flaps prior to the stall
 - Simulating base-to-final overshoot
 - Level wings with rudder
- 6**
 - Emphasize rudder coordination, leveling wings with rudder (not aileron), and traffic avoidance throughout the maneuver

Power-On/ Departure Stall



BPPP Limitations:

- Do not perform stalls with fuel in tip tanks
- Do not perform stalls with more than one person in the rear seats

1

Enter with:

- Power 15" MP
- Mixture(s) FULL RICH
- Gear DOWN
- Flaps UP

2

Reaching normal climb speed:

- Establish climb attitude
- Power 20" MP
- Wings level, coordinated flight
- Gradually increase back pressure to stall

3

• Level wings as necessary with rudder, not aileron

• Recover to a shallow climb attitude with power in coordinated flight

• Positive rate, then Gear UP

4

• Repeat using 25° bank and Approach flaps prior to the stall

- Simulating turn after takeoff
- Level wings with rudder, not aileron

5

• Emphasize rudder coordination, leveling wings with rudder (not aileron), and traffic avoidance throughout the maneuver

Accelerated Stall: Effect of Bank



1

- Airspeed: below V_A
- Mixture(s) FULL RICH

2

- Increase back pressure rapidly
- Establish a steep bank

3

- Note the indicated airspeed at which stall warning occurs
- Recover at stall warning by releasing back pressure, then rolling the wings level with coordinated controls

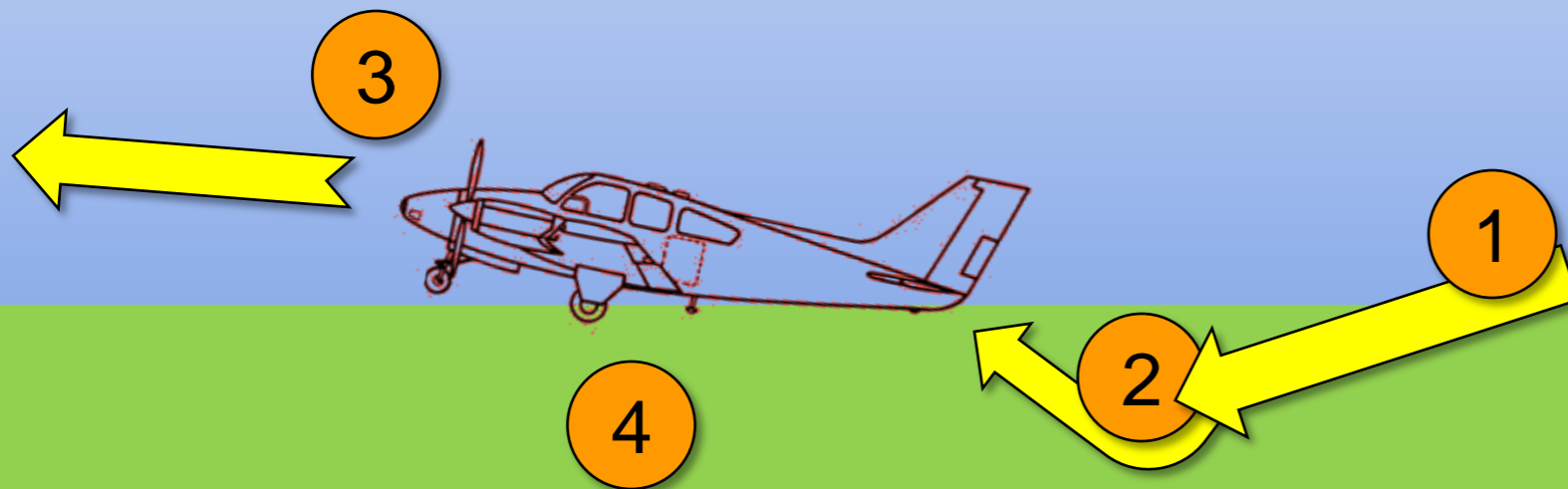
4

- Emphasize rudder coordination, leveling wings with rudder (not aileron), and traffic avoidance throughout the maneuver

BPPP Limitations:

- Do not perform stalls with fuel in tip tanks
- Do not perform stalls with more than one person in the rear seats

Accelerated Stall: Effect of Pitch



1

- Power IDLE
- Mixture(s) FULL RICH
- Gear DOWN
- Establish a glide at 90-95 knots

2

- Increase back pressure rapidly
- Establish a steep climb attitude

3

- Note the indicated airspeed at which stall warning occurs
- Recover at stall warning by releasing back pressure
- Level wings as necessary with rudder, not aileron

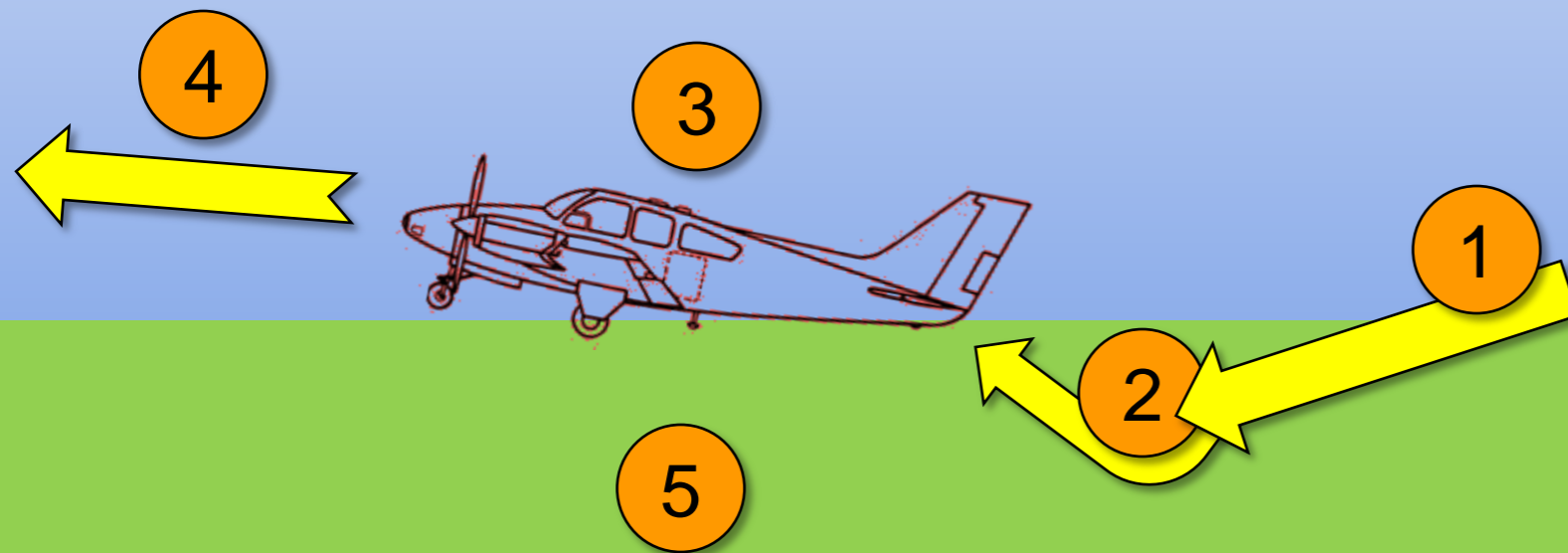
4

- Emphasize rudder coordination, leveling wings with rudder (not aileron), and traffic avoidance throughout the maneuver

BPPP Limitations:

- Do not perform stalls with fuel in tip tanks
- Do not perform stalls with more than one person in the rear seats

Go-Around or Trimmied Stall



1

- Set up for a Power Off/ Approach stall

2

- At 75-80 knots (Bonanza/ Debonair) or 95-100 knots (Baron/Travel Air), raise the nose to 15° up
- Add full power

3

- Note the indicated airspeed at which stall warning occurs
- Recover by pushing the nose down to a slight climb attitude at the first stall indication or if full rudder if required to maintain directional control
- Level wings as necessary with rudder, not aileron

4

- Note the need to push forward against the trim to avoid excessive pitch-up

5

- Emphasize rudder coordination, leveling wings with rudder (not aileron), and traffic avoidance throughout the maneuver

BPPP Limitations:

- Do not perform stalls with fuel in tip tanks
- Do not perform stalls with more than one person in the rear seats

Manual Landing Gear Extension

Section III BEEHCRAFT Bonanza F33A
Emergency Procedures CE-674 and after

NOTE

Do not attempt to operate the electric trim system until the cause of the malfunction has been determined and corrected.

LANDING GEAR MANUAL EXTENSION

Manual extension of the landing gear can be facilitated by first reducing airspeed. Then proceed as follows:

1. LDG GR MOTOR Circuit Breaker (Right Subpanel) - OFF (pull out)
2. Landing Gear Switch Handle - DOWN position
3. Handcrank Handle Cover (at rear of front seats) - REMOVE
4. Handcrank - ENGAGE and TURN COUNTERCLOCKWISE AS FAR AS POSSIBLE (approximately 50 turns)

CAUTION

The manual extension system is designed to lower the landing gear only. DO NOT ATTEMPT TO RETRACT THE GEAR MANUALLY.

5. If electrical system is operative, check landing gear position lights and warning horn (check LDG GR RELAY circuit breaker engaged).
6. Handcrank - DISENGAGE. Always keep it stowed when not in use.

WARNING

Do not operate the landing gear electrically with the handcrank engaged, as damage to the mechanism could occur.

After emergency landing gear extension, do not move any landing gear controls or reset any switches or circuit breakers until airplane is on jacks, as failure may have been in the gear-up circuit and gear might retract.

July, 1980

- Follow the checklist!
- Slow the airplane to 100 – 110 knots
- Turn the hand crank approximately 15 turns
- Sit up, confirm attitude, look for traffic
- Add 1 to 2" MP

Repeat the technique:

- Crank 15 turns
- Confirm attitude
- Look for traffic
- Add 1 to 2" MP

Then:

- Crank 10 turns (it will get harder)
- Confirm attitude
- Look for traffic
- Add 1 to 2" MP

And finally:

- Crank 10 turns **or until it will go no further**
- Confirm attitude
- Look for traffic
- Add 1 to 2" MP

Engine Failure and Glide Demonstration Bonanza/Debonair



1

- Cool the engine before beginning the maneuver
- Limit glide to 2000 to 3000 feet of altitude loss
- Simulate engine failure with a gradual throttle reduction

2

- Gear UP
- Flaps UP
- Cowl flaps CLOSED

3

- Establish Best Glide speed
- Note the pitch attitude: $\sim 5^\circ$ down
- Note vertical speed: $\sim 1500-1700$ fpm

4

- Simulate attempting engine restart
 - Switch fuel tanks
 - Mixture: FULL RICH (except turbocharged)
 - Auxiliary fuel pump ON/HIGH
 - Magneto switch BOTH
 - Alternate air handle PULL

5

- Committed to glide: PULL propeller control fully aft to the low RPM position
- Adjust pitch to maintain Best Glide speed
- Note the pitch attitude: LEVEL
- Note vertical speed: $\sim 500 - 700$ fpm

6

- Recover by advancing the propeller, then gradually increasing throttle

BPPP Limitation:

- Do not descend below 500 AGL unless landing on a paved runway at least 4000 feet long

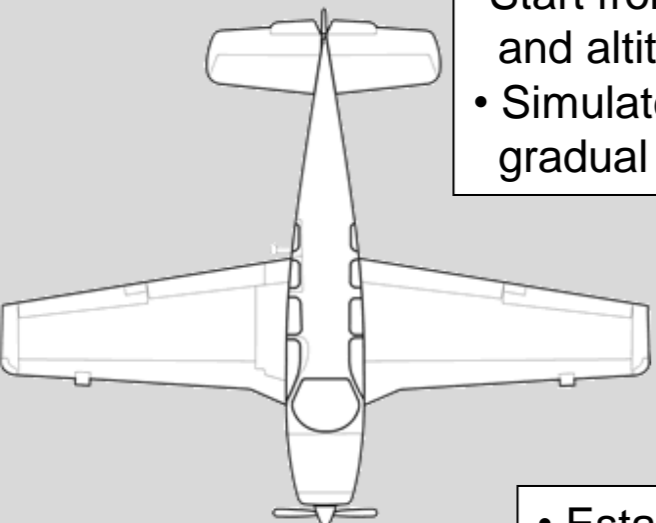
Forced Landing

Straight-in key
800 ft AGL

Base key
1000 ft AGL

1

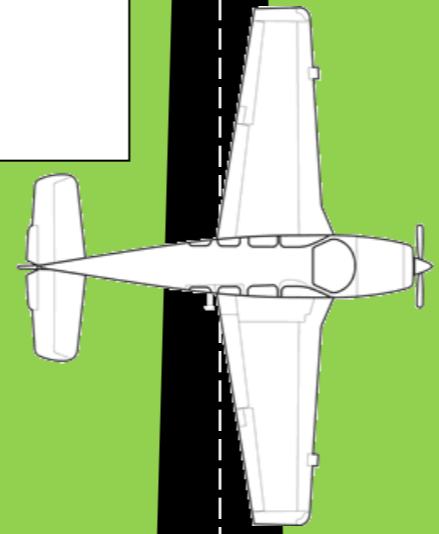
- Cool the engine before beginning the maneuver
- Start from the High Key position and altitude
- Simulate engine failure with a gradual throttle reduction



High key
2500 ft AGL
MIDFIELD

- Establish Best Glide speed
- For training purposes and to ensure power in the event of a go-around:
 - Manifold pressure: 10-11 inches
 - Propeller: High RPM
 - Gear DOWN
 - Vertical speed: ~700 fpm to simulate glide

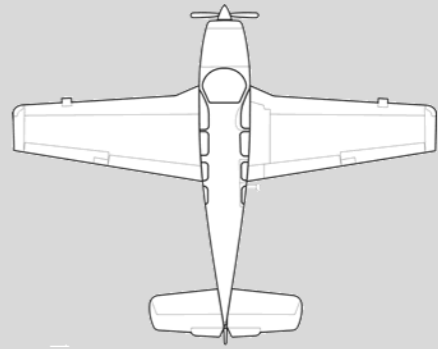
2



5

- Be ready to go around at any time

Downwind key
1500 ft AGL



- Demonstrate increasing IAS to increase vertical speed

4

- ~25° bank continual gliding turn from any Key position
- Vary bank to compensate for wind

3

BPPP Limitation:
• Paved runway at least 4000 feet long



Normal Landing



1

- Approach-Level configuration in the pattern
- Gear down to go down

2

- Final GUMP check at 500 feet AGL
- Do not switch fuel tanks

3

- Slow to 50-foot speed in landing configuration over the runway threshold

4

- Keep weight off nosewheel during rollout
- Use brakes sparingly

BPPP Limitations:

- Paved runway
- After landing, do not reconfigure the airplane until coming to a complete stop
- Touch-and-goes are prohibited
- If landing gear is not down at 500 ft AGL, go around



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Crosswind Landing

1

- Approach-Level configuration in the pattern
- Gear down to go down

2

- Final GUMP check at 500 feet AGL
- Do not switch fuel tanks

3

- Slow to 50-foot speed plus $\frac{1}{2}$ the gust factor in landing configuration over the runway threshold
- In very gusty conditions, use partial flaps and add five additional knots to final approach speed

4

- Carry a small amount of power during the flare
- Close the throttle(s) fully after touching down
- Keep weight off nosewheel during rollout
- Use brakes sparingly

BPPP Limitations:

- Paved runway
- After landing, do not reconfigure the airplane until coming to a complete stop
- Touch-and-goes are prohibited
- If landing gear is not down at 500 ft AGL, go around

Short-Field Landing

1

- Approach-Level configuration in the pattern
- Gear down to go down

2

- Final GUMP check at 500 feet AGL
- Do not switch fuel tanks

3

- Reduce power on final approach to create a steeper glide path
- Slow to 50-foot speed in landing configuration over the runway threshold
- Add $\frac{1}{2}$ the gust factor in gusty wind conditions

4

- Add a small amount of power to cushion touchdown
- Close the throttle(s) fully after touching down
- Keep weight off nosewheel during rollout
- Use brakes as needed but do not lock brakes

BPPP Limitations:

- Paved runway
- After landing, do not reconfigure the airplane until coming to a complete stop
- Touch-and-goes are prohibited
- If landing gear is not down at 500 ft AGL, go around

Soft-Field Landing



1

- Approach-Level configuration in the pattern
- Gear down to go down

2

- Final GUMP check at 500 feet AGL
- Do not switch fuel tanks

3

- Slow to 50-foot speed in the landing configuration over the runway threshold
- Fly onto the surface with a small amount of power at the slowest safe speed

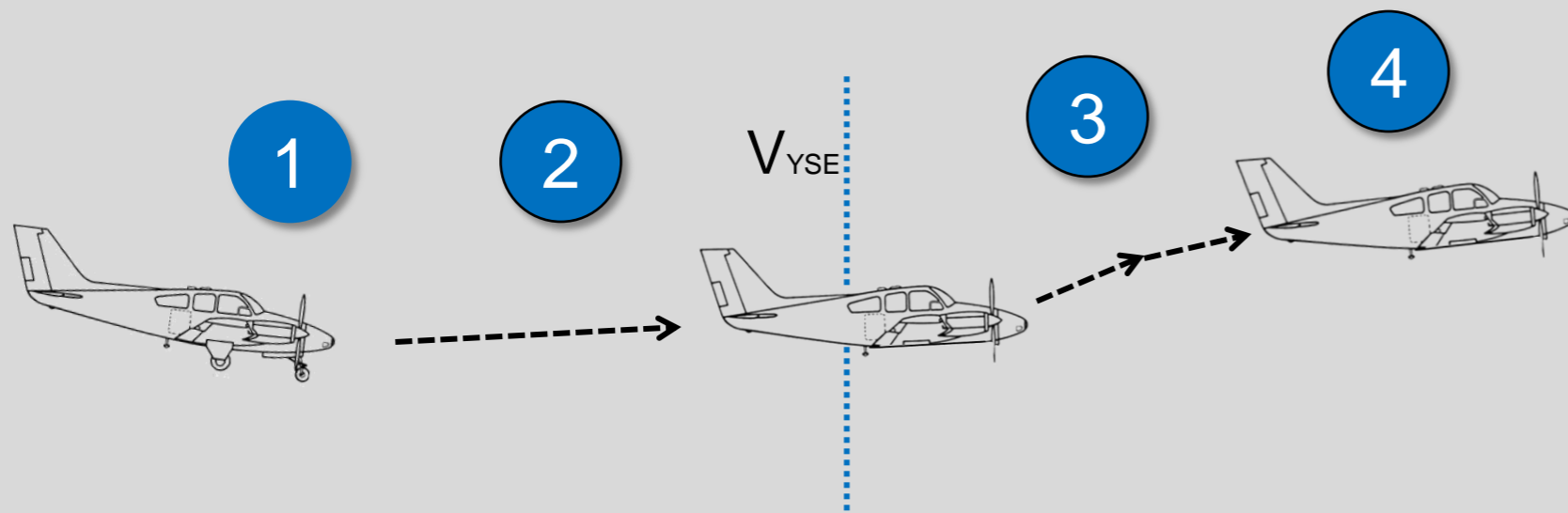
4

- Continue to hold back pressure to keep the nose up during rollout and after you transition to taxi
- Avoid using brakes

BPPP Limitations:

- After landing, do not reconfigure the airplane until coming to a complete stop
- Touch-and-goes are prohibited
- If landing gear is not down at 500 ft AGL, go around

Go-Around/ Missed Approach



1

Baron/Travel Air

- Apply full power
 - Mixtures
 - Throttles
 - Propellers
- Maintain rudder coordination
- Establish slight climb (+5°)

2

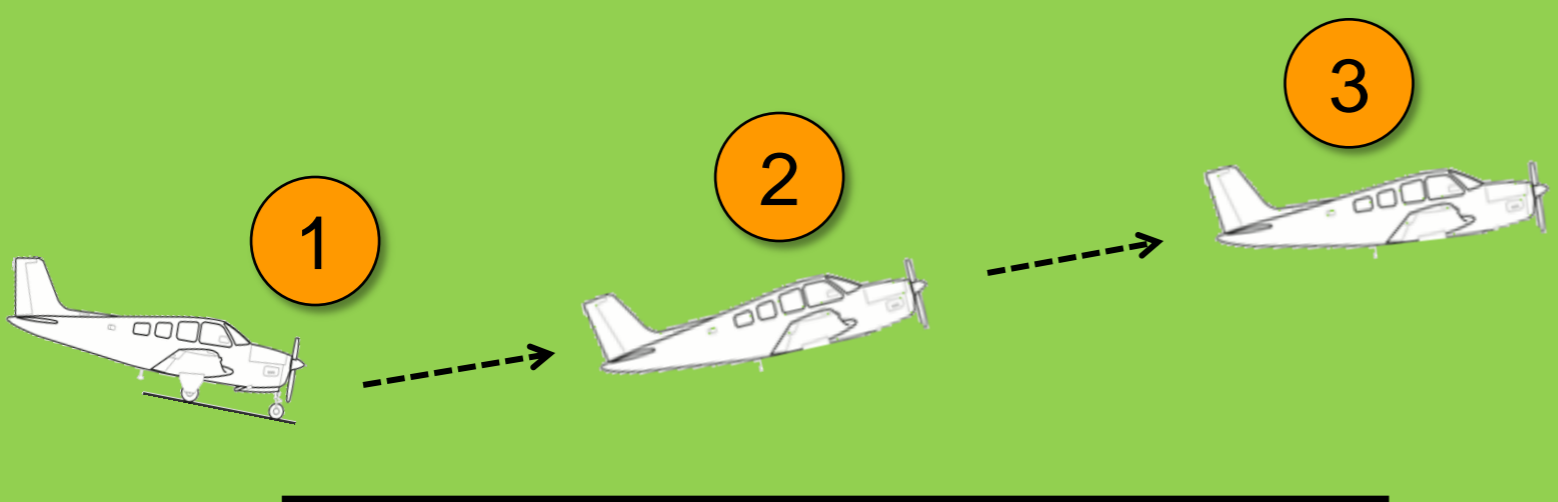
- Verify a positive rate of climb
- Retract flaps
- Retract landing gear
- Accelerate through V_{YSE}
- Open cowl flaps

3

- If needed to clear obstacles, adjust attitude to V_{XME} (+12°)

4

- When clear of obstacles, adjust attitude to V_{YME} attitude (+7°) and enter climb



1

Bonanza/Debonair

- Apply full power
 - Mixture
 - Throttle
 - Propeller
- Maintain rudder coordination
- Establish V_x attitude (+10°)

2

- Verify a positive rate of climb
- Retract flaps
- Retract landing gear
- Open cowl flaps, if equipped

3

- When clear of obstacles, adjust attitude to V_y attitude (+7°) and enter climb

Missed Approach

Do not pitch to V_x attitude

- **Bonanza/Debonair:** Establish V_y at Step 1
- **Baron/Travel Air:** Establish V_{YME} at Step 3.