

Takeoff & Landing Precautions

Don't become a Statistic

Presented to: CAP / FIRC

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Federal Aviation
Administration



Introduction

- **Approximately 65% of all general aviation accidents occur during takeoffs, landings, or low altitude maneuvering and virtually all are pilot-related**



Introduction

- **We can't eliminate the need to maneuver near the ground or to take off or land, but we can address the skill issues with the pilots performing those maneuvers**



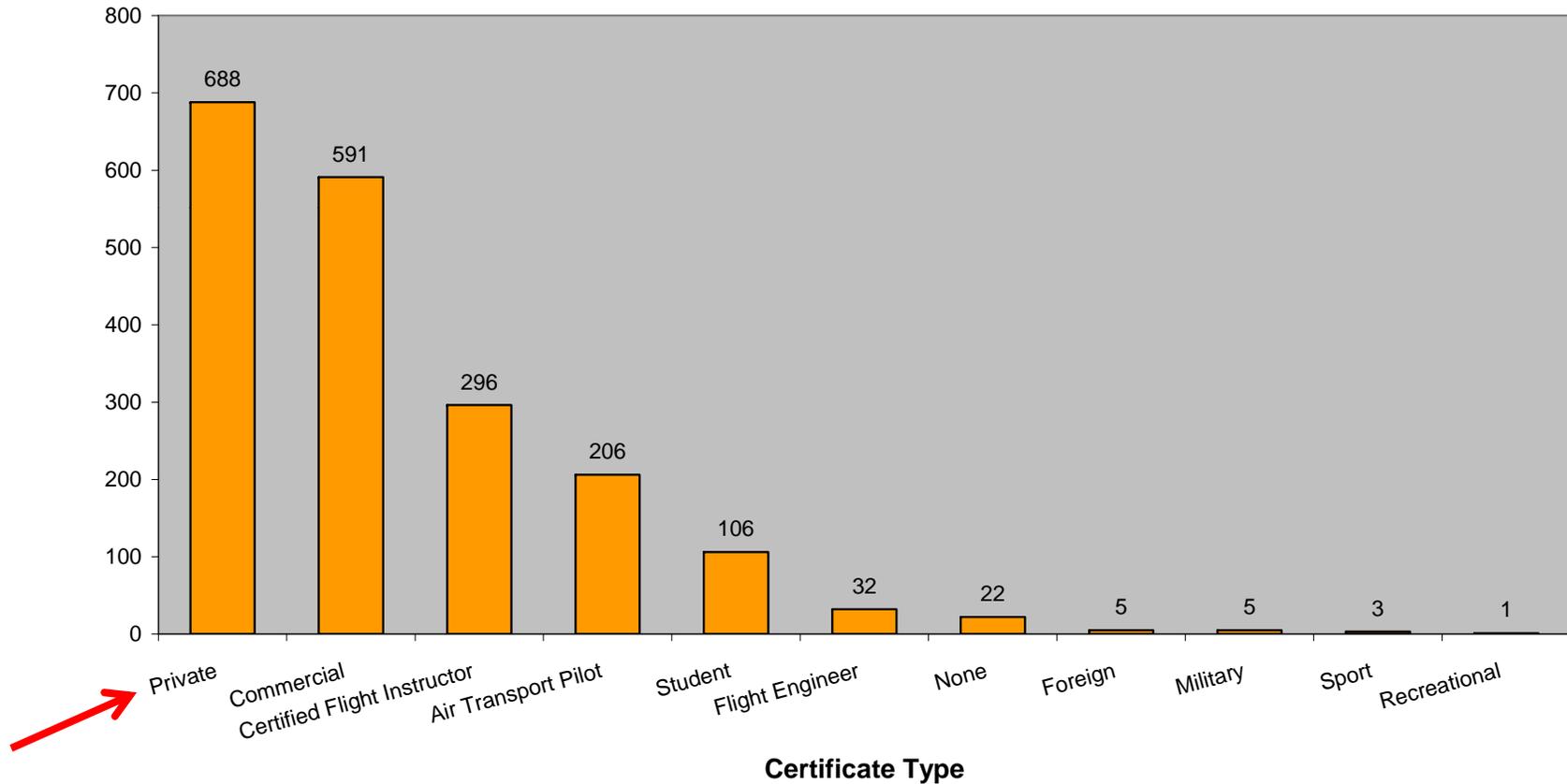
Overview

- **Statistics**
- **Contributing factors**
- **Analysis**
- **Recommendations**
- **Conclusions**



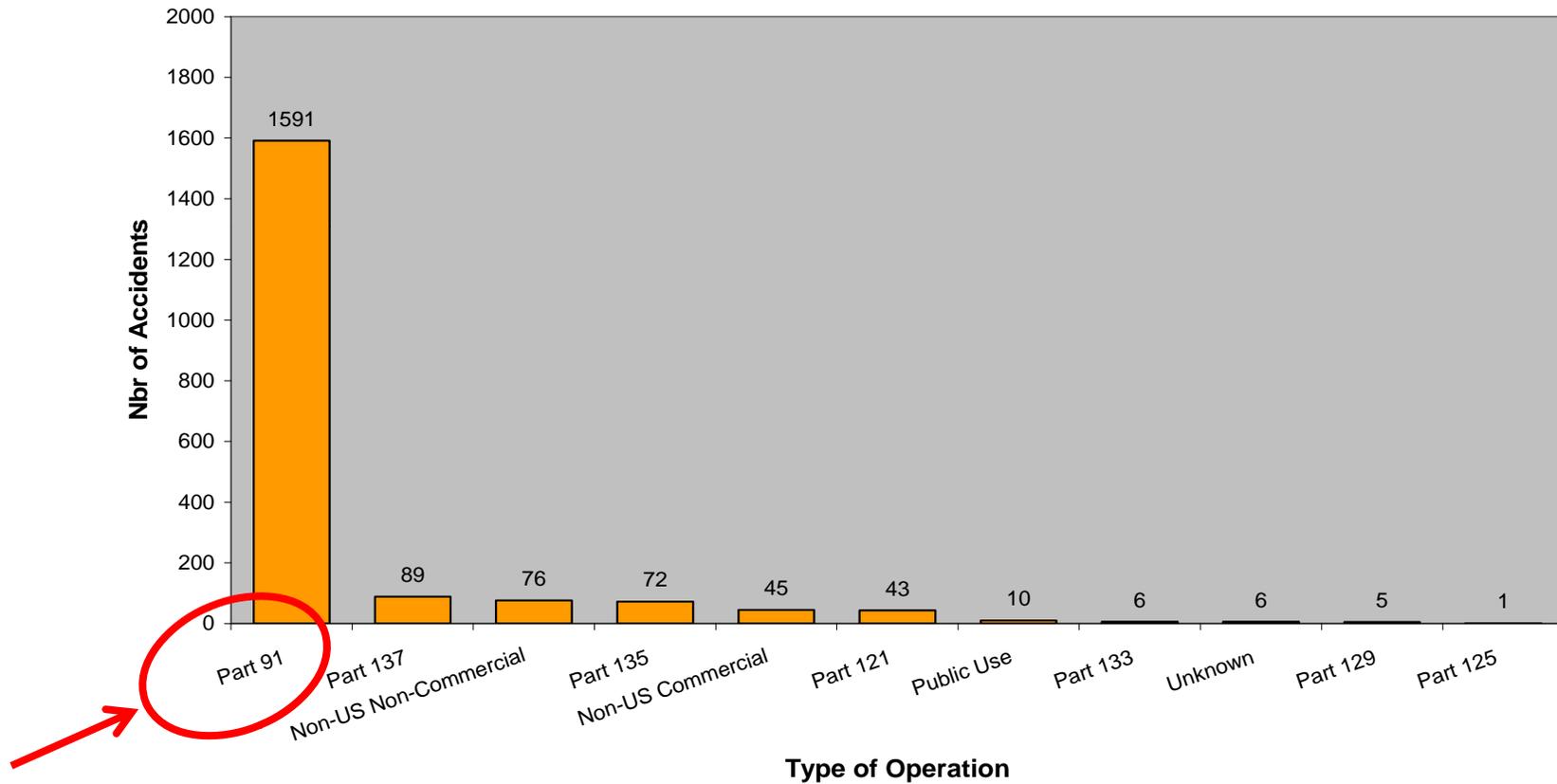
Statistics

FAASTeam Accidents - National Level Pilot Certificate January 2005 through December 2005



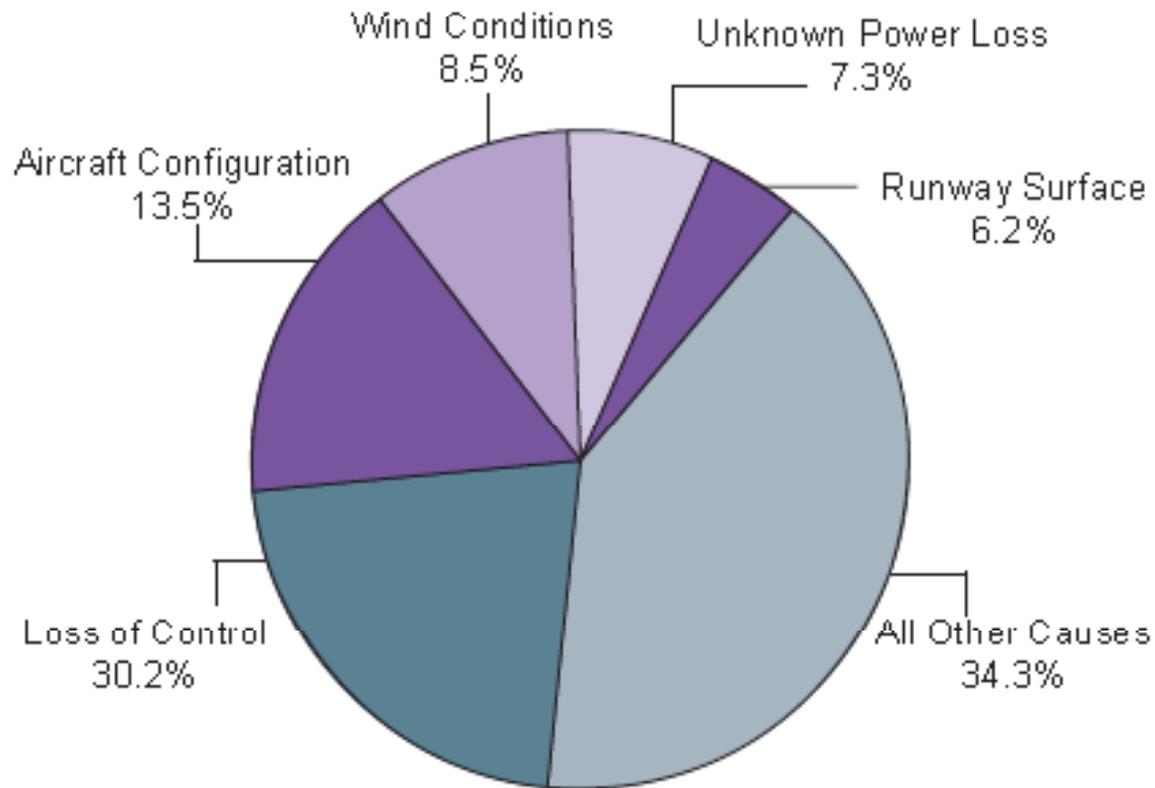
Statistics

FAASTeam Accidents by Type of Operation - National Level
Jan 2005 through Dec 2005



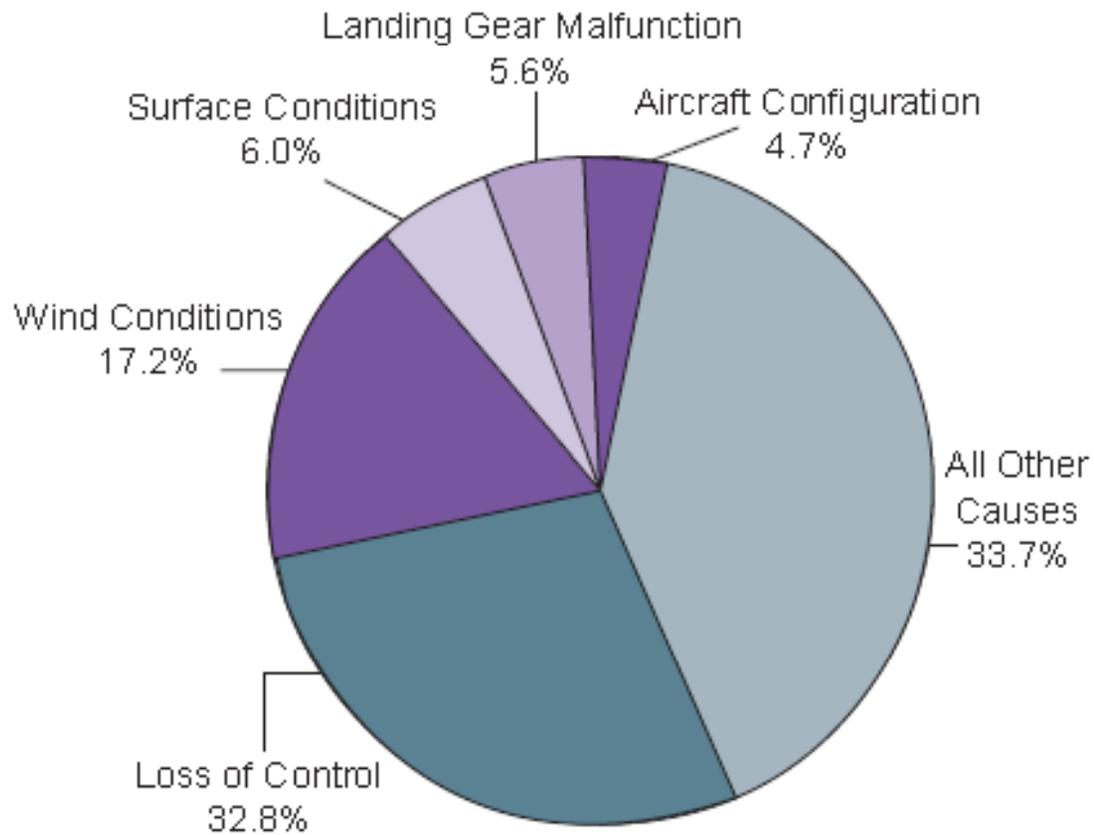
Statistics

Leading Takeoff Accident Causes



Statistics

Leading Landing Accident Causes



Statistical Conclusion

- **30.2% - Loss of Control on Takeoff**
- **32.8% - Loss of Control on Landing**
- **Most accidents occur under FAR Part 91**
- **Most accidents occur by Private Pilots**



Contributing Factors

- ✓ **Aircraft Control**
- ✓ **Configuration**
- ✓ **Runway Length**
- ✓ **Density Altitude**
- ✓ **Obstructions**
- ✓ **Wind**
- ✓ **Runway Slope**
- ✓ **Soft / Contaminated Runway**
- ✓ **Heavy**
- ✓ **Night**



Important !!!

- **Remember to always use:**
 - the manufacturer's recommended procedures;
 - airplane configuration and airspeeds
 - other information relevant to to specific make and model airplane
- **USE:**
 - FAA-approved Airplane Flight Manual and/or Pilot's Operating Handbook (AFM/POH) for that airplane.



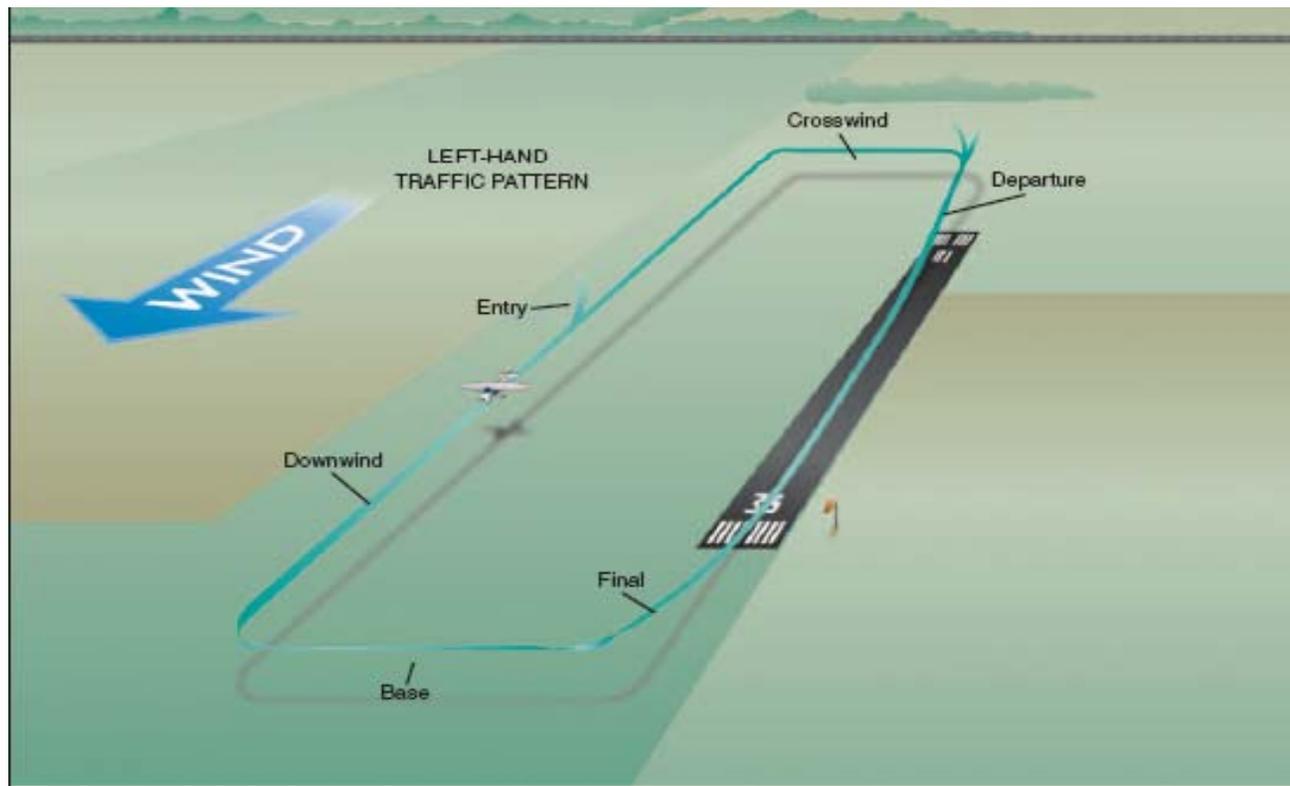
Analysis

- **Pattern**
- **Stabilized Approach**
- **Go Around**
- **Wind effect on T/O & Landing**
- **Region of Reverse Command**
- **Faulty Approaches**



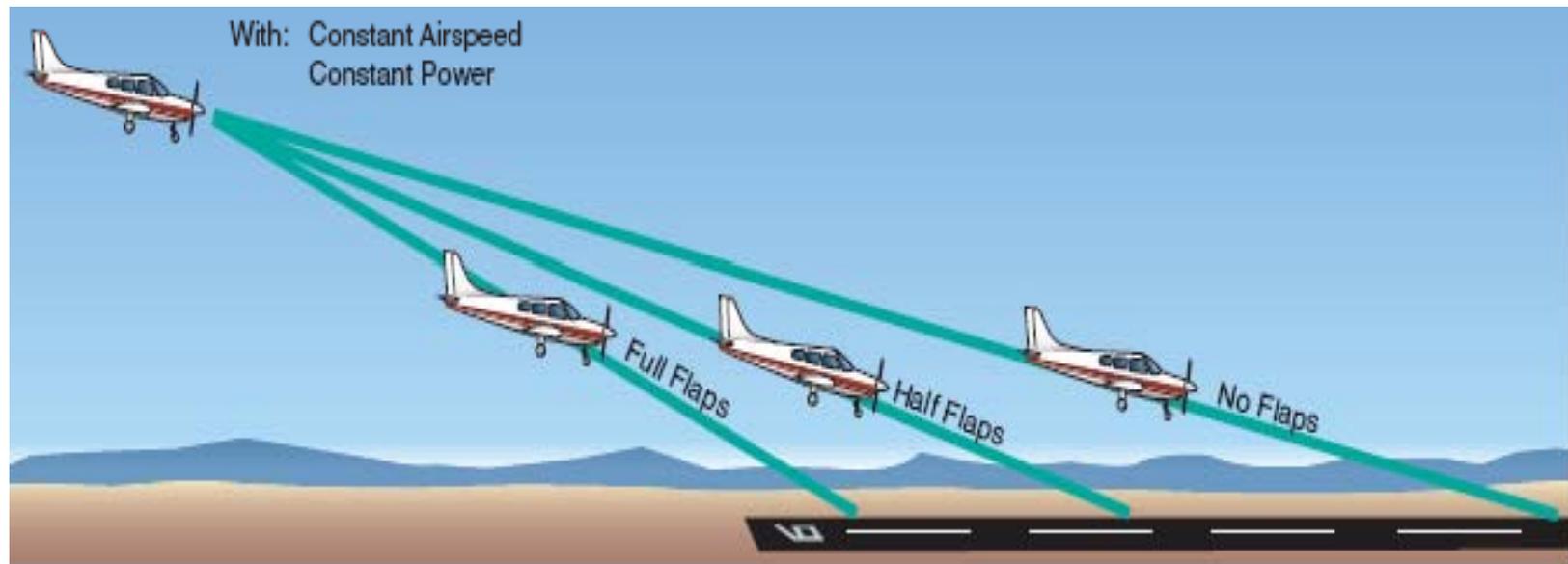
Pattern

- **Standard Pattern:**
 - Left Turns



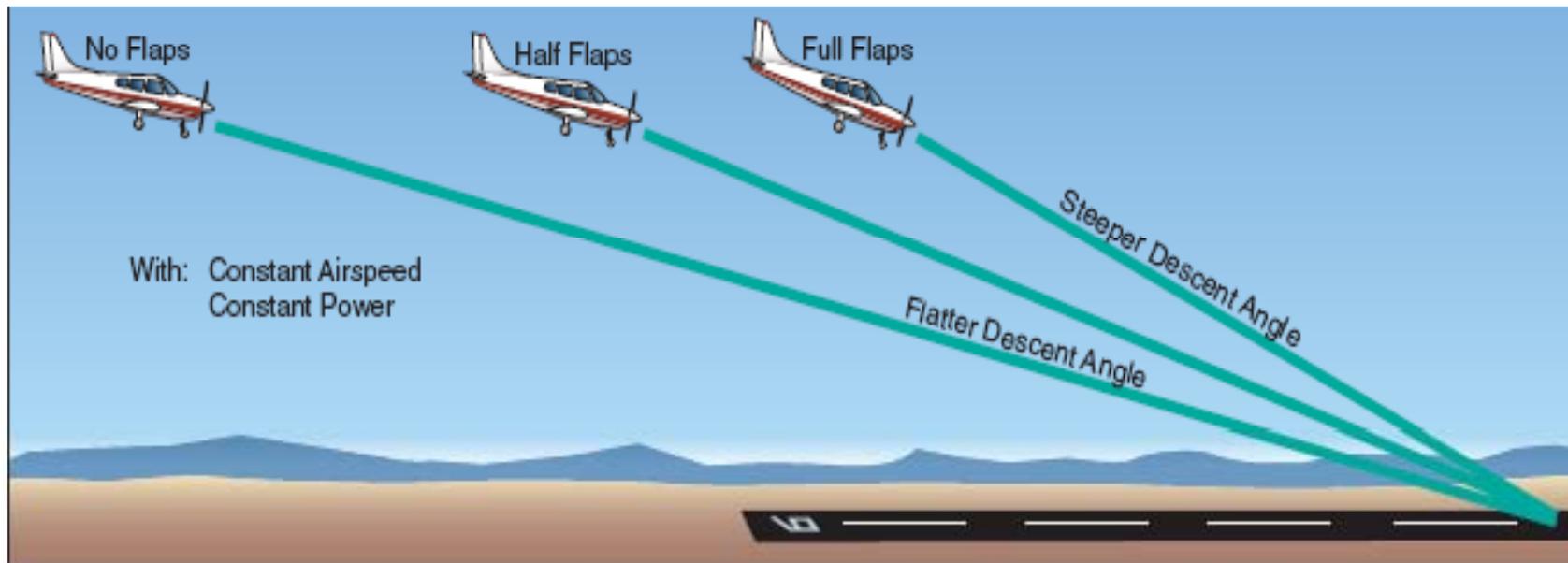
Pattern

- **Effect of Flaps**
 - Landing Point



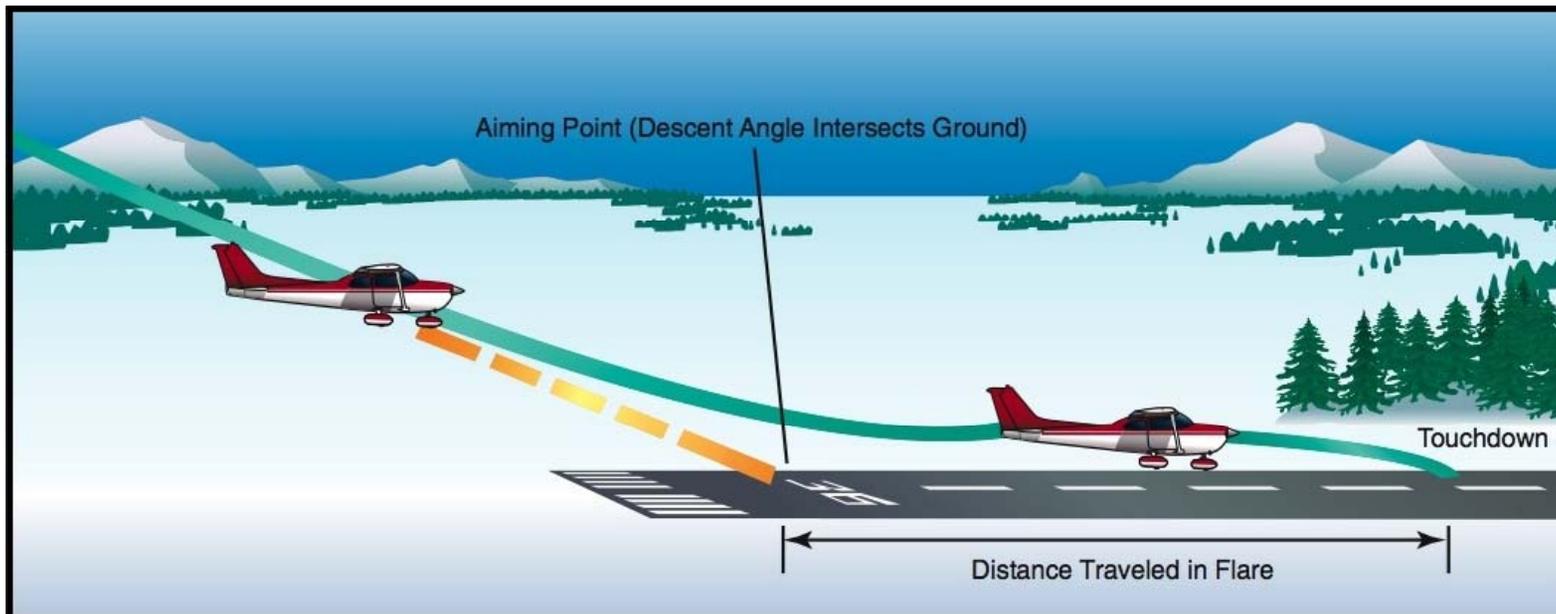
Pattern

- **Effect of Flaps**
 - Descent angle



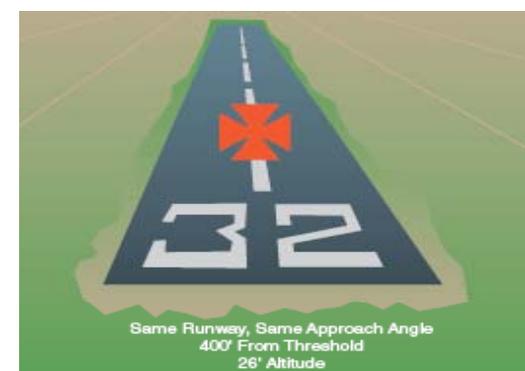
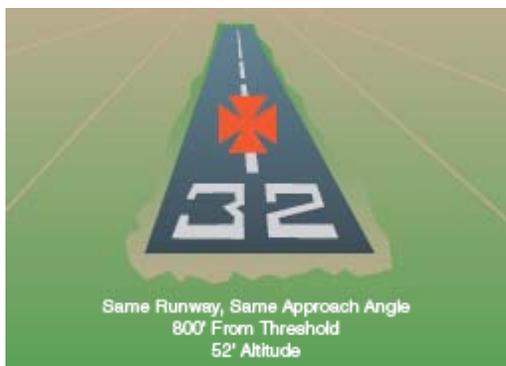
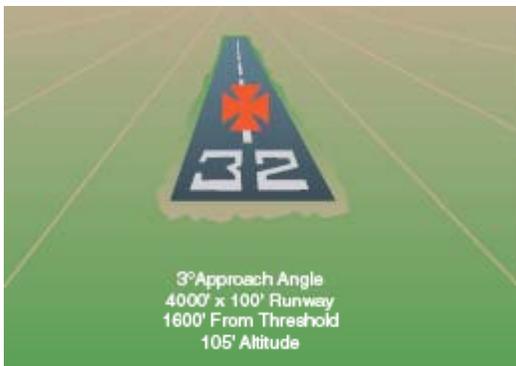
Stabilized Approach

- the pilot establishes and maintains a constant angle glide-path towards a predetermined point on the landing runway.



Stabilized Approach

- during a stabilized approach the runway shape does not change.



Stabilized vs. Unstabilized



Stabilized



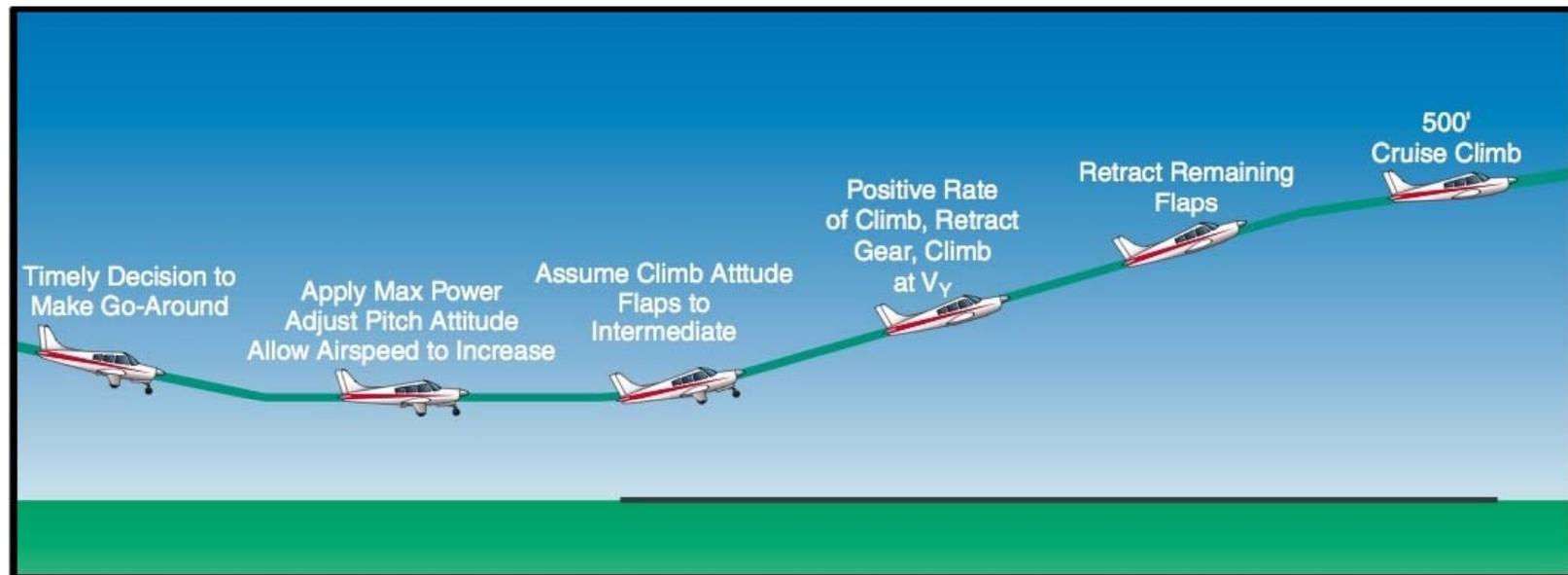
Go Around

- **Make the decision EARLY**
 - Power
 - Attitude
 - Configuration



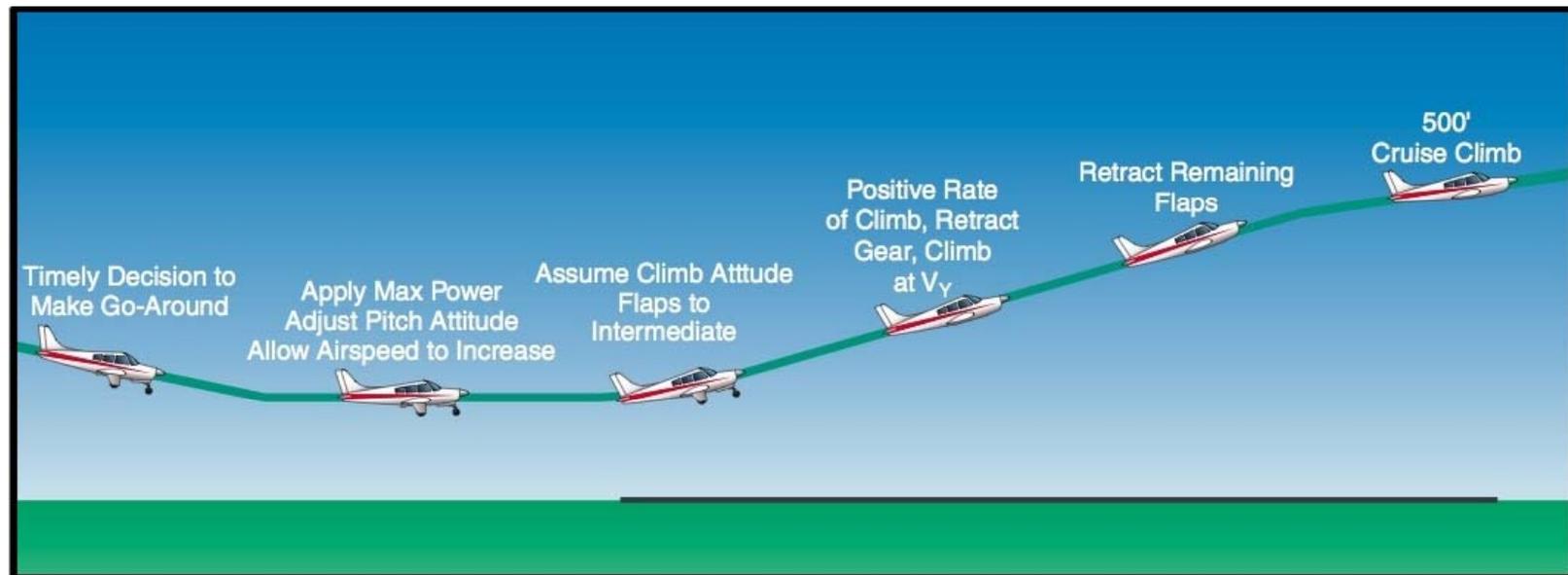
Go Around

- The pilot executing a go-around must accept the fact that an airplane will not climb until it can fly, and it will not fly below stall speed.
- cleaning up:
 - be concerned first with flaps and secondly with the landing gear (if retractable).



Go Around

- The addition of power will tend to raise the airplane's nose suddenly and veer to the left
- Right rudder pressure must be increased to counteract torque and P-factor to keep the nose straight



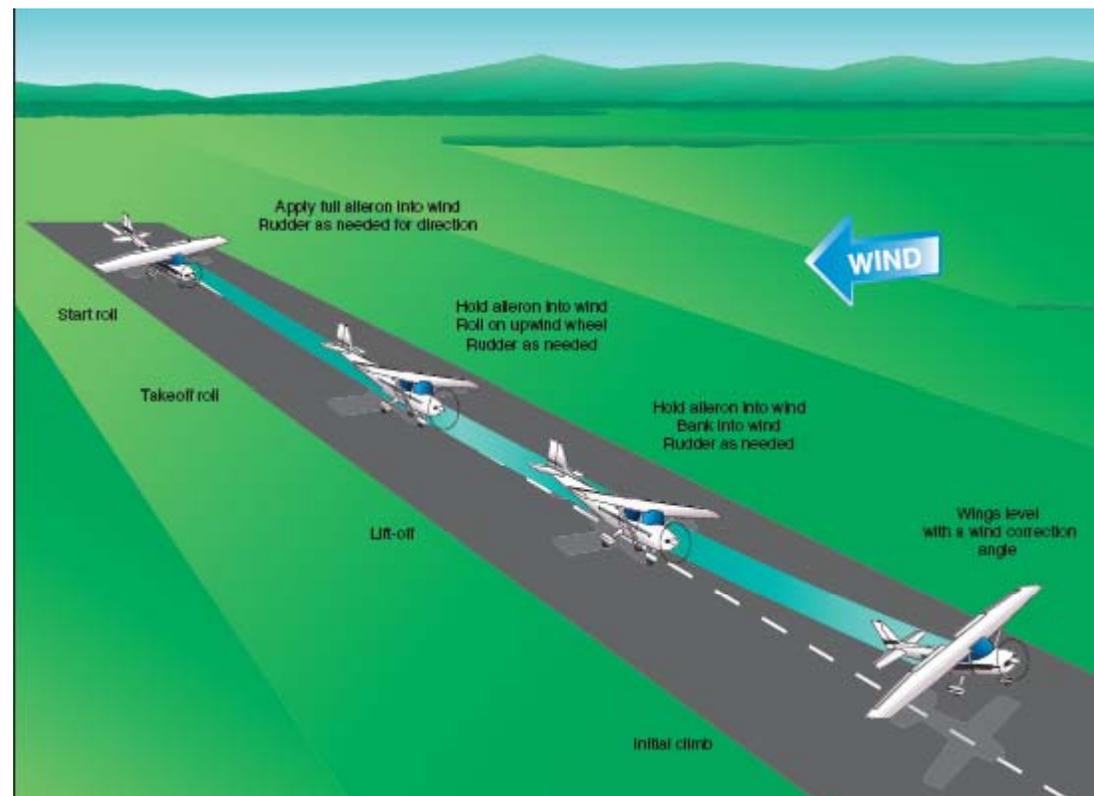
Common errors (Go Around)

- **Failure to recognize a condition that warrants a rejected landing.**
- **Indecision.**
- **Delay in initiating a go-round.**
- **Failure to apply maximum allowable power in a timely manner.**
- **Abrupt power application.**
- **Improper pitch attitude.**
- **Failure to configure the airplane appropriately.**
- **Attempting to climb out of ground effect prematurely.**
- **Failure to adequately compensate for torque/P-factor.**



Wind Effect (takeoff)

- Aileron held into the crosswind
- As aileron becomes more effective - reduce



Wind Effect

2 methods of accomplishing a crosswind approach:

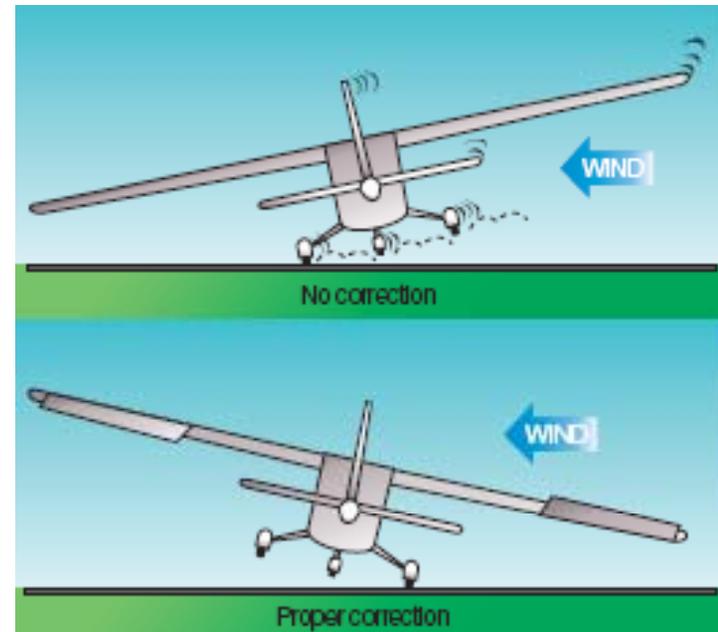
Crab Method



Wing Low



Wind Effect



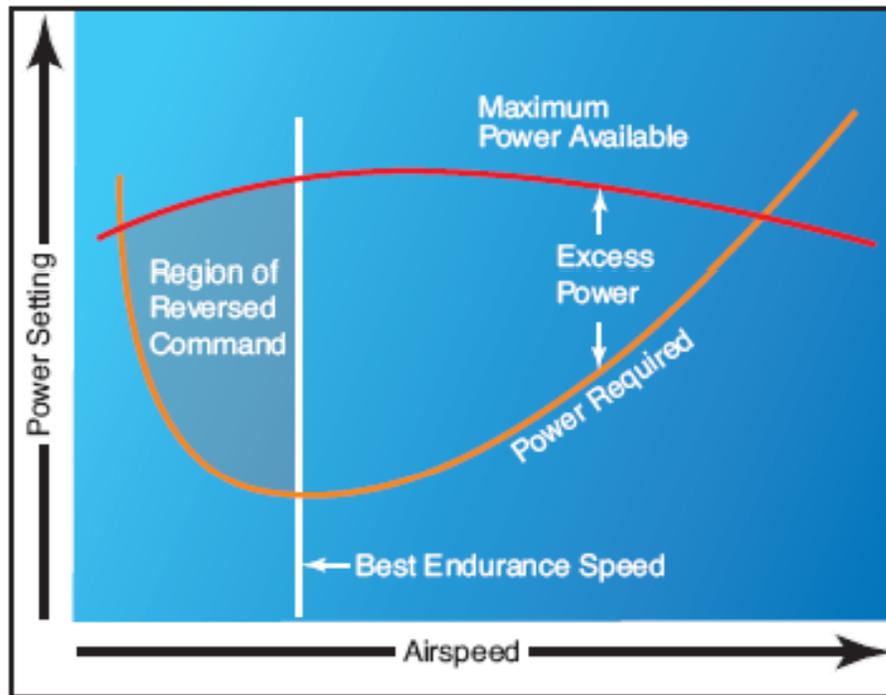
Common Errors (Crosswind Approach)

- **Attempting to land in XW that exceeds maximum demonstrated XW component.**
- **Inadequate compensation for wind drift - base leg to final approach**
- **Inadequate compensation for wind drift on final approach.**
- **Unstabilized approach.**
- **Failure to compensate for increased drag during sideslip resulting in excessive sink rate and/or too low an airspeed.**
- **Touchdown while drifting.**
- **Excessive airspeed on touchdown.**
- **Failure to apply appropriate flight control inputs during rollout.**
- **Failure to maintain direction control on rollout.**



Region of Reverse Command

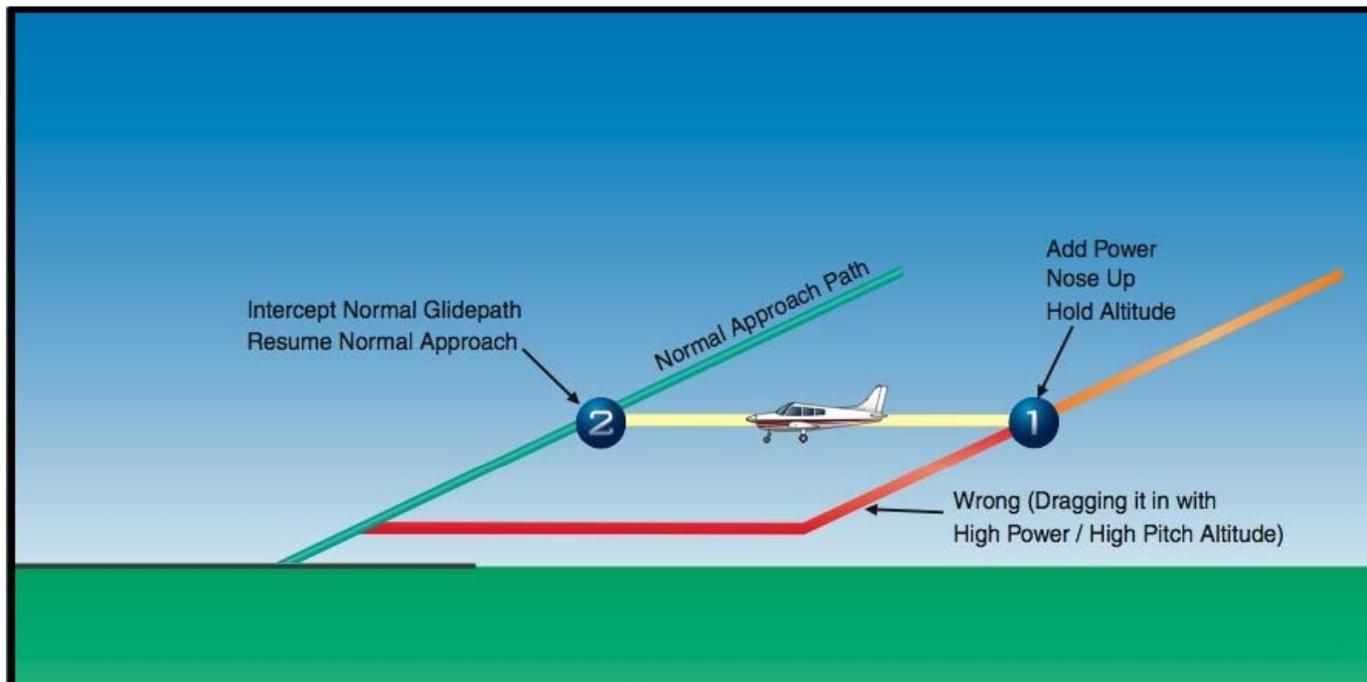
- Flight regime in which flight at a higher airspeed requires a lower power setting and a lower airspeed requires a higher power setting in order to maintain altitude.



Faulty Approaches

- **Low Final Approach**

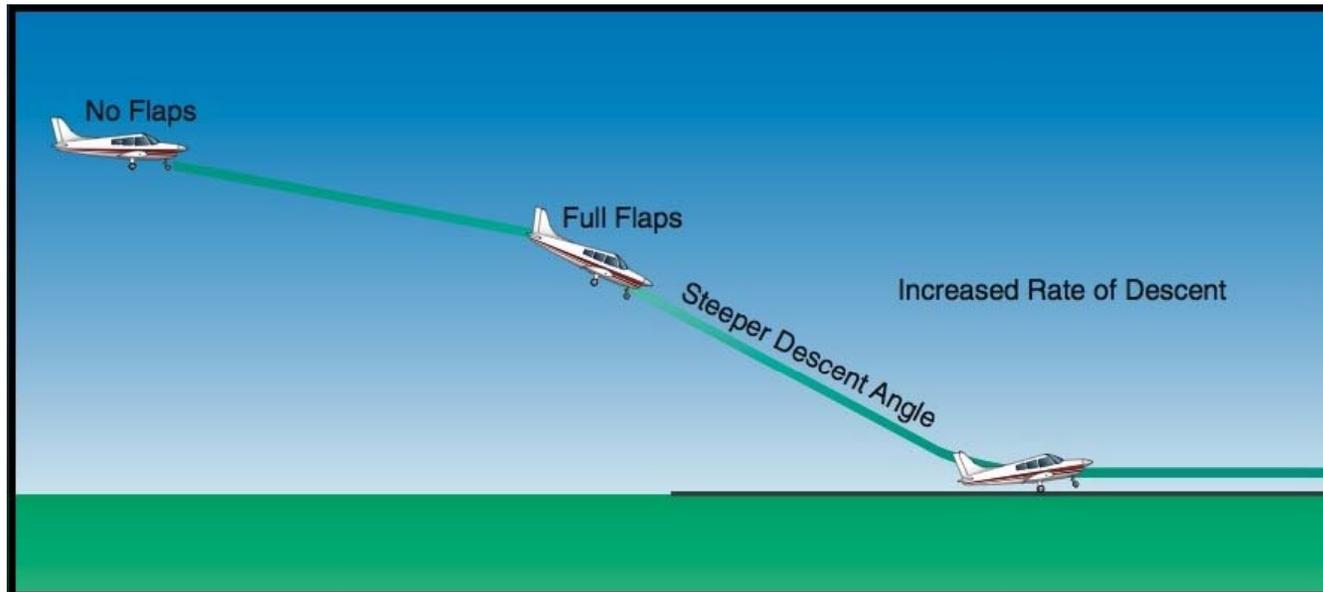
- DO NOT increase the pitch attitude without increasing the power
- DO NOT retract the flaps
- **EXECUTE AN IMMEDIATE GO-AROUND**



Faulty Approaches

- **High Final Approach**

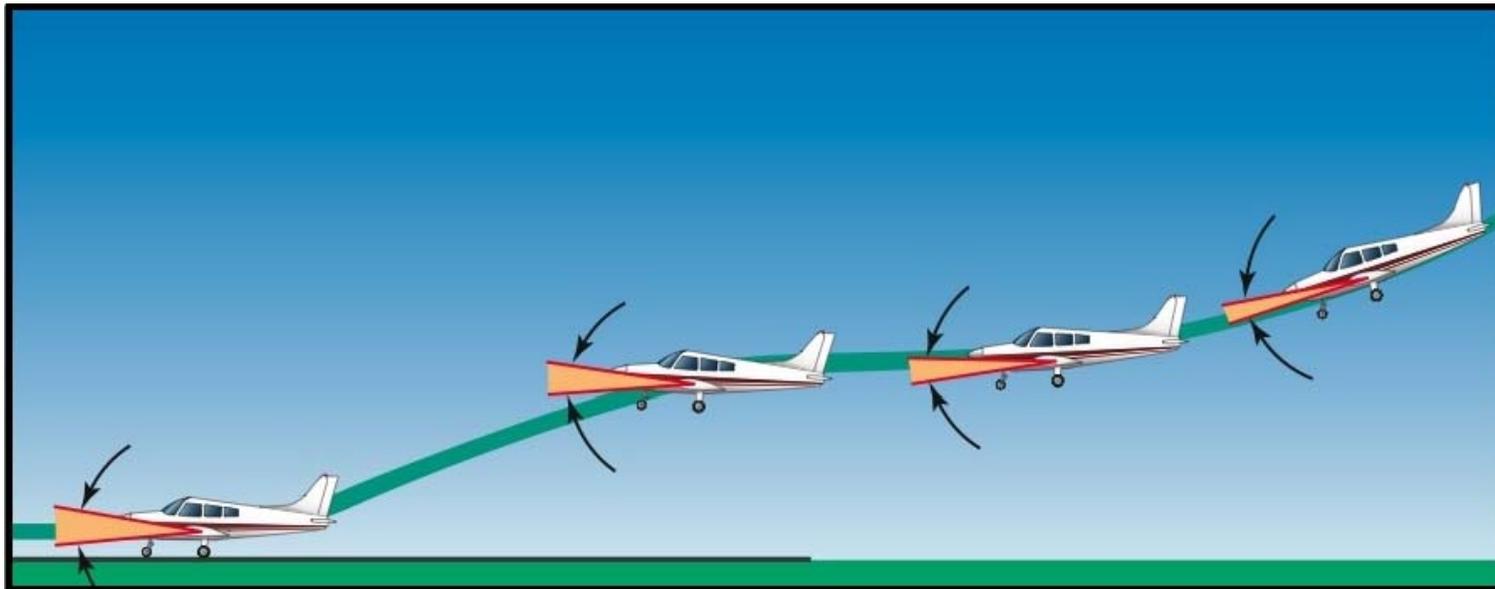
- lower the flaps as required
- reduction in power may be necessary while lowering the nose simultaneously to maintain approach airspeed and steepen the approach path
- When the proper approach path has been intercepted, adjust the power as required to maintain a stabilized approach



Faulty Approaches

- **Slow Final Approach**

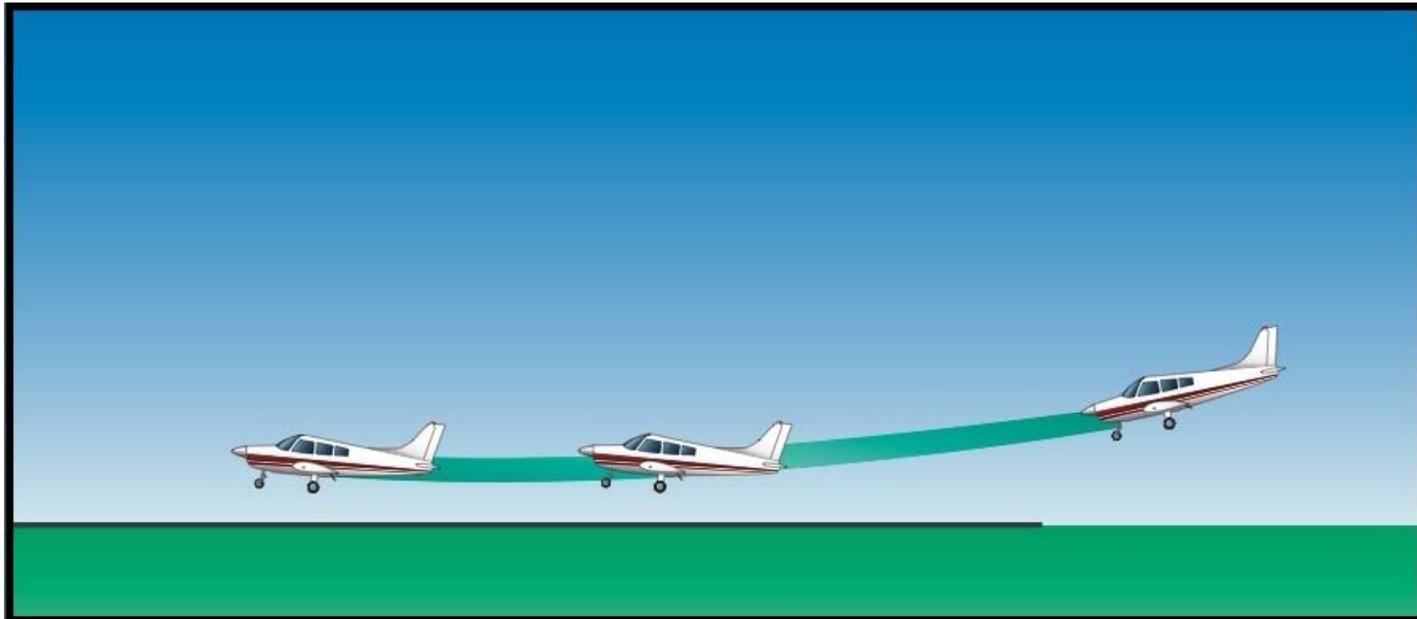
- During an excessively slow approach, the wing is operating near the critical angle of attack
- depending on the pitch attitude changes and control usage, the airplane may stall or sink rapidly



Faulty Approaches

- **Floating During Roundout**

- airspeed on final approach is excessive
- If a landing cannot be made on the **first third of the runway**, or the airplane drifts sideways, you should **EXECUTE A GO-AROUND**.



Conclusions

- **Most accidents in General Aviation occur due to loss of aircraft control**
- **Remember to always use:**
 - the manufacturer's recommended procedures;
 - airplane configuration and airspeeds
 - other information relevant to to specific make and model airplane



Pay Close Attention

- ✓ **Aircraft Control**
- ✓ **Configuration**
- ✓ **Runway Length**
- ✓ **Density Altitude**
- ✓ **Obstructions**
- ✓ **Wind**
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Conclusions

“Just because your aircraft has a “parachute” doesn’t make it safe”



Questions???

