



VICTORIA FLYING CLUB

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Approach and Landing

- Review Descending, Slow Flight and Slipping
- Definition and Motivation
- Approach and Landing
 - Normal, Short-Field, Soft-Field, Crosswind
 - Factors
- Summary and Questions
- Pre-Flight Briefing



Review Descending and Slow Flight

- Mentally perform a power-off and power-on descent and state all observations and required actions (PAT).
- Define and state the best glide airspeed.
- How do we recognize that a ground reference can be reached during a descent?
- What is slow flight and how do we recover from the slow flight range?
- Define and state the two stall v-speeds.



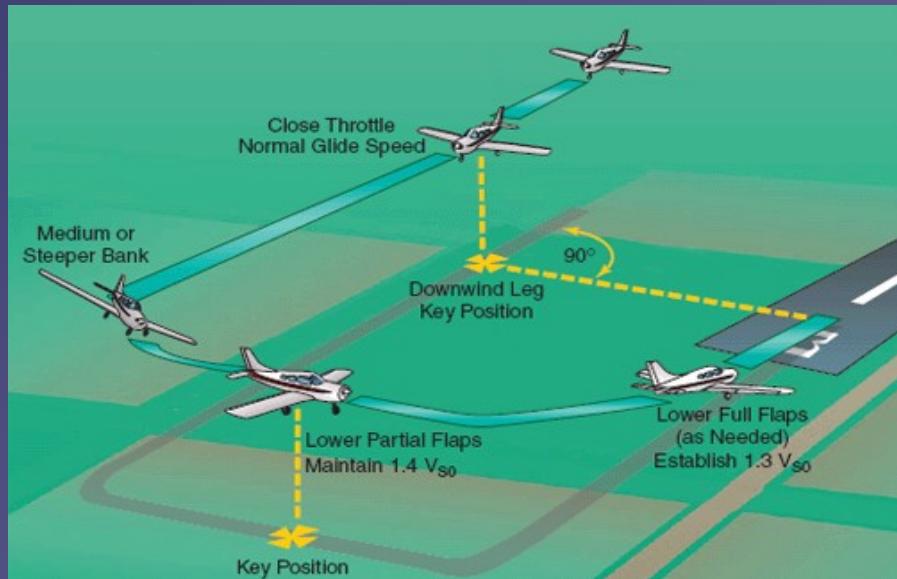
Definition and Motivation



- *Landing is the last part of a flight, where a flying animal, aircraft, or spacecraft returns to the ground.*
- **Stabilized approach, flare, touchdown, ground roll**
- Essential maneuver used in every single flight



Normal Approach and Landing



- Criteria: hard uncontaminated surface, **long** runway, no obstacles, **low** density altitude, no or steady headwind
- Check environment and consult **performance** data in POH
- Pre-landing checks according to **checklists** in POH
- **Passenger, arrival and emergency briefings**



Normal Landing – Approach



Align and Descent

Perspective

Approach Speed

- Align with **runway** and establish a **stabilized descent**
- Aim for runway threshold to flare into landing zone
- Set **flaps** as required (**10°-20°**) in **white arc** (below **85 KIAS**)
- *Continuously* check correct approach **airspeed** (**65-75 KIAS**)
- Adjust **power** to maintain **attitude** and **perspective**



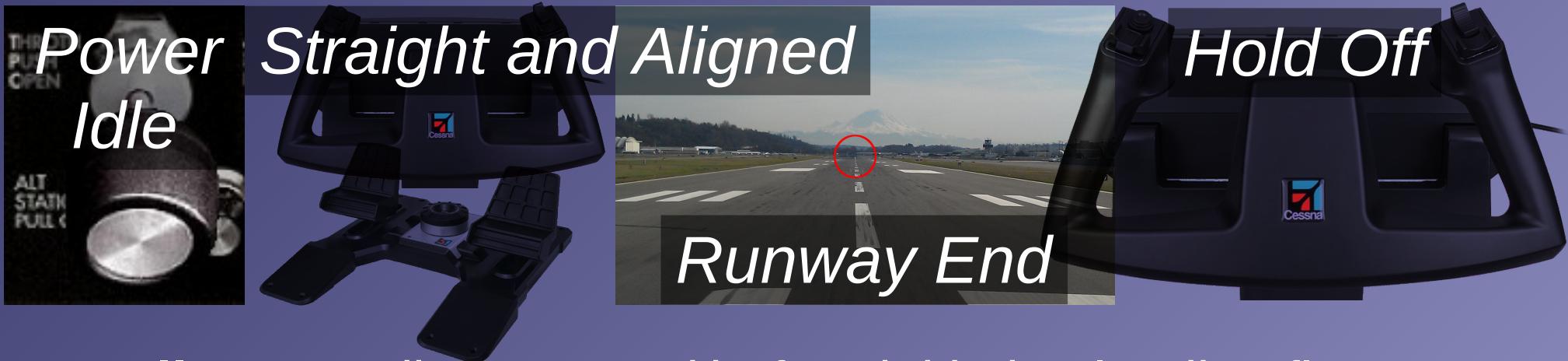
Approach Perspective



- Maintain **descent angle** (perspective) and **attitude**
- Control **airspeed** and **rate of descent** with **power**
- Be aware of potential **visual illusions**



Normal Landing – Flare and Touchdown



- Callout *Landing Assured* before initiating landing flare
- Reduce **power** to **idle** keeping **straight**
- Use **runway end** as reference for directional control
- Continue to **decelerate** in **level slow flight** above runway
- Gently increase **elevator** back-pressure to assume **landing attitude** gradually – slight **nose-up**, **main-wheels** first

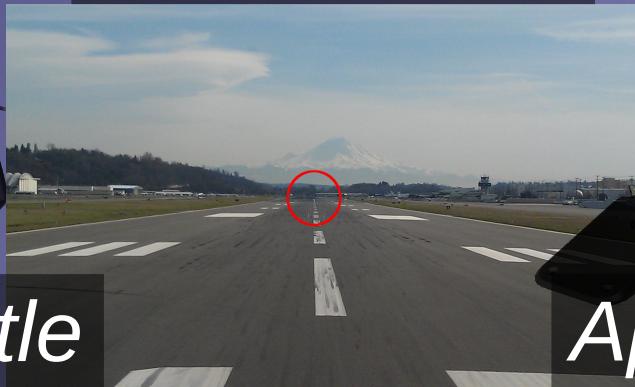


Normal Landing – Ground Roll

Keep Straight



Runway End



Allow Nose Wheel to Settle



Apply Brakes

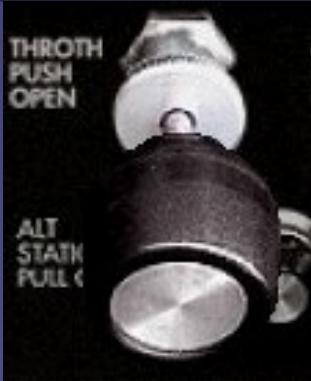
- Keep **straight** with **rudder** using **peripheral vision**
- Hold **elevator** back-pressure allowing nose wheel to settle
- *Gently apply* **brakes** keeping **straight** towards **runway end**
- **Slow down** to taxi speed and **vacate runway**
- Post-Landing – flaps, transponder, lights, time, clearance



Overshoot / Go-Around

Full Power

Control Yaw



*Assume Slight
Nose-Up Attitude*



*Flaps Up
In Stages*



- Reasons: balked landing, failures, traffic, animals, humans
- Apply **full power** controlling yaw with **rudder**
- Assume a *slight nose-up attitude* just above the horizon
- Retract **flaps** to **10°** and accelerate to safe climb speed
- Maintain climb speed and retract flaps in **white arc**

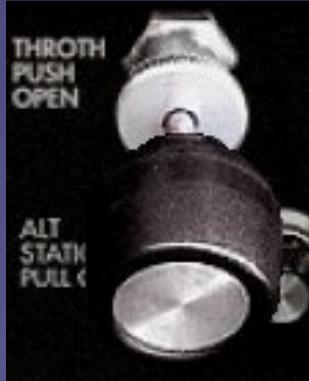


Touch and Go

Flaps Up



Full Power



Keep Straight



Runway End



- Ensure sufficient runway length beforehand
- Retract **flaps** completely during ground roll, **trim** for take-off
- Apply **full power** and keep **straight** with **rudder**
- Use **runway end** as reference for directional control
- Perform **take-off run** and **initial climb** as required



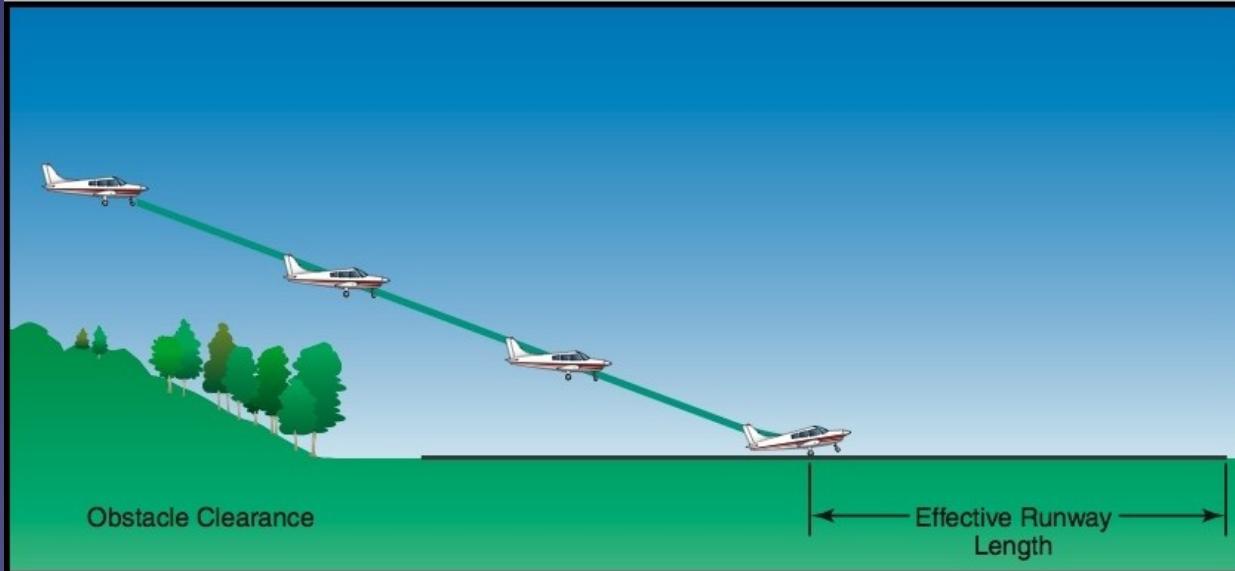
Stop and Go



- *Ensure sufficient runway length beforehand*
- Perform landing to **full stop** on the runway
- Perform subsequent **take-off** from **stop position**



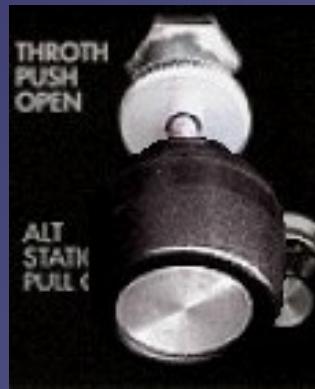
Short-Field Landing



- Criteria: hard uncontaminated surface, **short** runway, **obstacles**, **high** density altitude, no or steady headwind
- Check environment and consult **performance** data in POH
- Pre-landing checks according to **checklists** in POH
- Passenger, arrival and emergency briefings



Short-Field Landing – Approach



Align and Descent

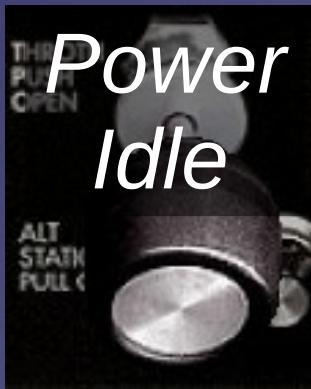
Perspective

Approach Speed

- Align with **runway** and establish a *stabilized descent*
- Aim for runway threshold or *before* to flare into landing zone
- Set **full flaps** (30°) in **white arc** (**40-85 KIAS**)
- *Continuously* check correct approach **airspeed** (**61 KIAS**)
- Adjust **power** to maintain **attitude** and **perspective**



Short-Field Landing – Flare and Touchdown



- Callout *Landing Assured* before initiating landing flare
- Reduce **power** to **idle** keeping **straight**
- Use **runway end** as reference for directional control
- Continue to **decelerate** in **level slow flight** above runway
- Gently increase **elevator** back-pressure to assume **landing attitude** gradually – slight **nose-up**, **main-wheels first**



Short-Field Landing – Ground Roll

Keep Straight Runway End



Hold Back-Pressure



Flaps Up



Apply Brakes

- Keep **straight** with **rudder** using **peripheral vision**
- Hold **elevator** back-pressure allowing nose wheel to settle
- Retract **flaps** *immediately*
- Apply **brakes** *firmly* and increase **elevator** back-pressure
- Keep **straight** and **slow down** to taxi speed and **vacate runway**
- Cleanup – flaps, transponder, lights, time, clearance



Landing Performance

SHORT FIELD LANDING DISTANCE AT 2550 POUNDS										
Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst								
S. L.	545	1290	565	1320	585	1350	605	1380	625	1415
1000	565	1320	585	1350	605	1385	625	1420	650	1450
2000	585	1355	610	1385	630	1420	650	1455	670	1490
3000	610	1385	630	1425	655	1460	675	1495	695	1530
4000	630	1425	655	1460	675	1495	700	1535	725	1570
5000	655	1460	680	1500	705	1535	725	1575	750	1615
6000	680	1500	705	1540	730	1580	755	1620	780	1660
7000	705	1545	730	1585	760	1625	785	1665	810	1705
8000	735	1585	760	1630	790	1670	815	1715	840	1755

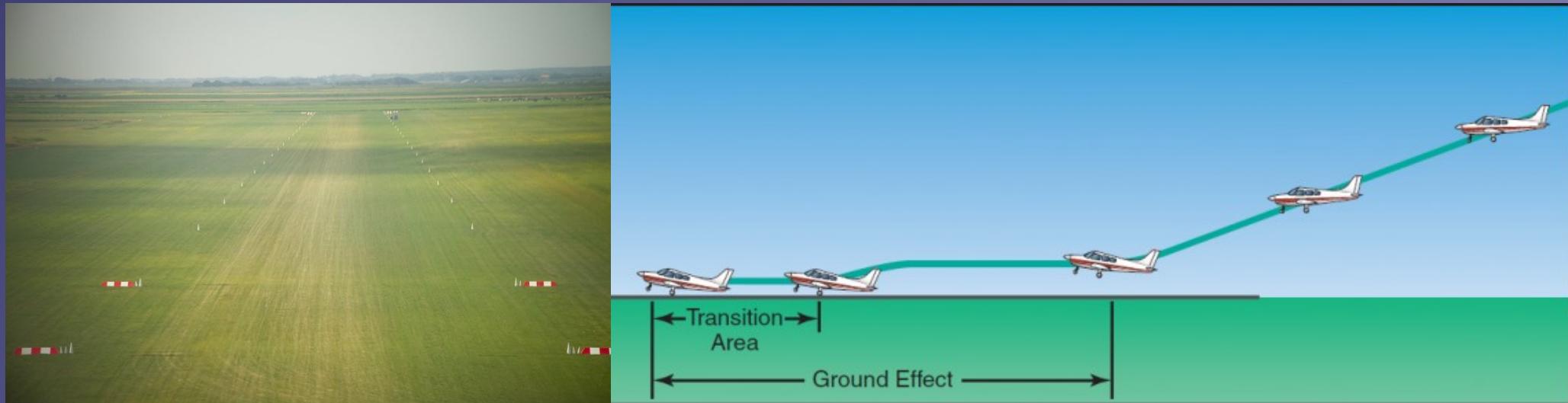
NOTES:

1. Short field technique as specified in Section 4.
2. Decrease distances 10% for each 9 knots headwind. For operation with tail winds up to 10 knots, increase distances by 10% for each 2 knots.
3. For operation on dry, grass runway, increase distances by 45% of the "ground roll" figure.
4. If landing with flaps up, increase the approach speed by 9 KIAS and allow for 35% longer distances.

- Consider conditions
- Select pressure altitude
- Select temperature
- Determine required landing ground roll and distance
- Apply corrections



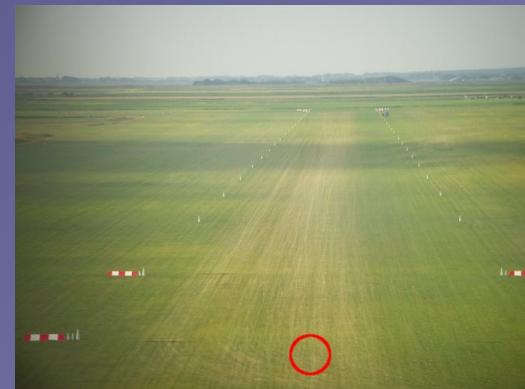
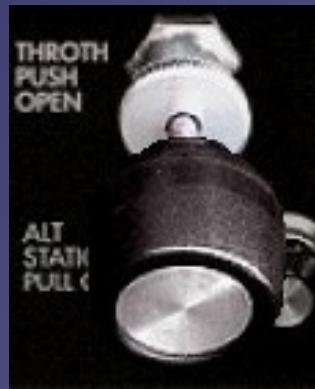
Soft-Field Landing



- *Criteria:* **soft**, **rough** or **contaminated** surface, **long** runway, no obstacles, low density altitude, no or steady headwind
- Check environment and consult **performance** data in POH
- Pre-landing checks according to **checklists** in POH
- **Passenger**, **departure** and **emergency** briefings



Soft-Field Landing – Approach



Align and Descent

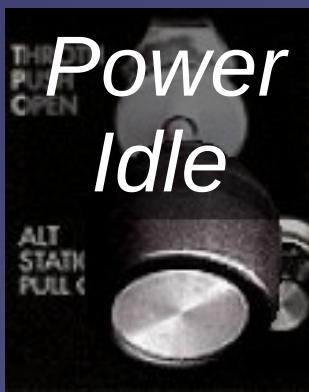
Perspective

Approach Speed

- Align with **runway** and establish a **stabilized descent**
- Aim for runway threshold to flare into landing zone
- Set **full flaps** (30°) in **white arc** ($40\text{-}85 \text{ KIAS}$)
- Continuously check correct approach **airspeed** ($60\text{-}70 \text{ KIAS}$)
- Adjust **power** to maintain **attitude** and **perspective**



Soft-Field Landing – Flare and Touchdown



- Callout *Landing Assured* before initiating landing flare
- Reduce **power** to **idle** keeping **straight**
- Use **runway end** as **reference** for directional control
- Continue to **decelerate** in level slow flight above runway
- Gently increase **elevator** back-pressure to assume **landing attitude** gradually – slight **nose-up**
- Gently add **power** to relieve **main wheels** during touchdown



Soft-Field Landing – Ground Roll

Keep Straight Runway End



Hold Nose Wheel Off



Keep Rolling

- Keep **straight** with **rudder** using **peripheral vision**
- Adjust **power** and **elevator** back-pressure to **hold off** nose wheel
- Apply *minimum brakes* and **keep straight**
- Keep **rolling** at taxi speed and **vacate runway**
- Stop on **supporting surface** *before* retracting flaps
- Cleanup – flaps, transponder, lights, time, clearance

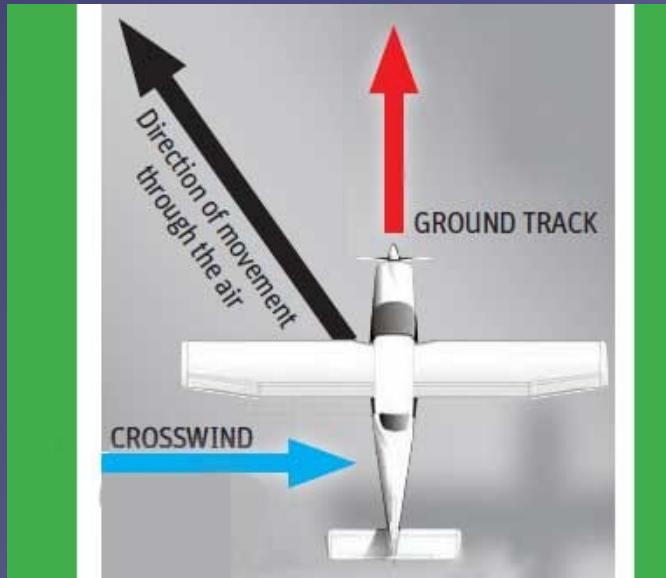


Review Slipping

- Define a slip and explain the difference between a side and a forward slip and their applications.
- Mentally perform a side slip and state all observations and actions.



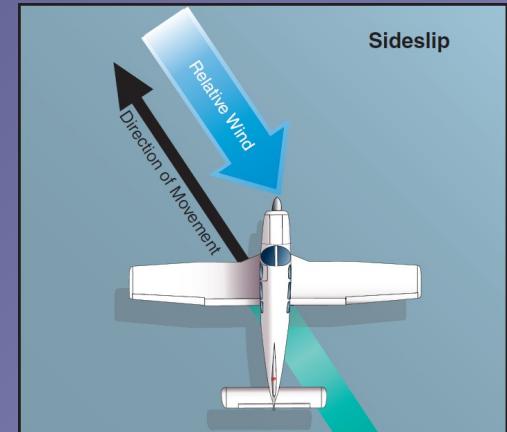
Crosswind Landing



- *Criteria: steady or gusty crosswind component (windshear)*
- Check environment and consult **performance** data in POH
- Pre-landing checks according to **checklists** in POH
- Maximum demonstrated crosswind component **15 knots**
- Passenger, arrival and emergency briefings



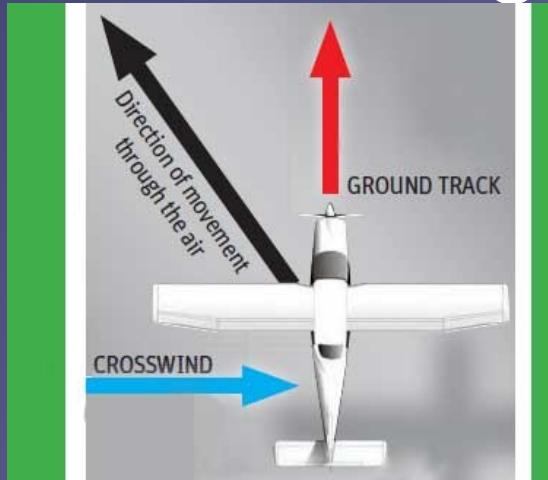
Crosswind Landing – Approach



- Align with **runway** and establish a crabbing *stabilized descent*
- Aim for runway threshold to flare into landing zone
- Set **minimum flaps** as required in **white arc (40-85 KIAS)**
- *Continuously* check correct approach **airspeed (65-75 KIAS)**
- Consider higher approach speed in gusts (windshear)
- Adjust **power** to maintain **attitude** and **perspective**
- Transition from crab into **side-slip** at **200' AGL**



Crosswind Landing – Flare and Touchdown



- Callout *Landing Assured* before initiating landing flare
- Reduce **power** to **idle** keeping **straight** side-slipping
- Use **runway end** as **reference** for directional control
- Continue to **decelerate** in level slow flight above runway
- Gently increase **elevator** back-pressure to assume **landing attitude** gradually – slight **nose-up**
- Touch down with **windward wheel** first



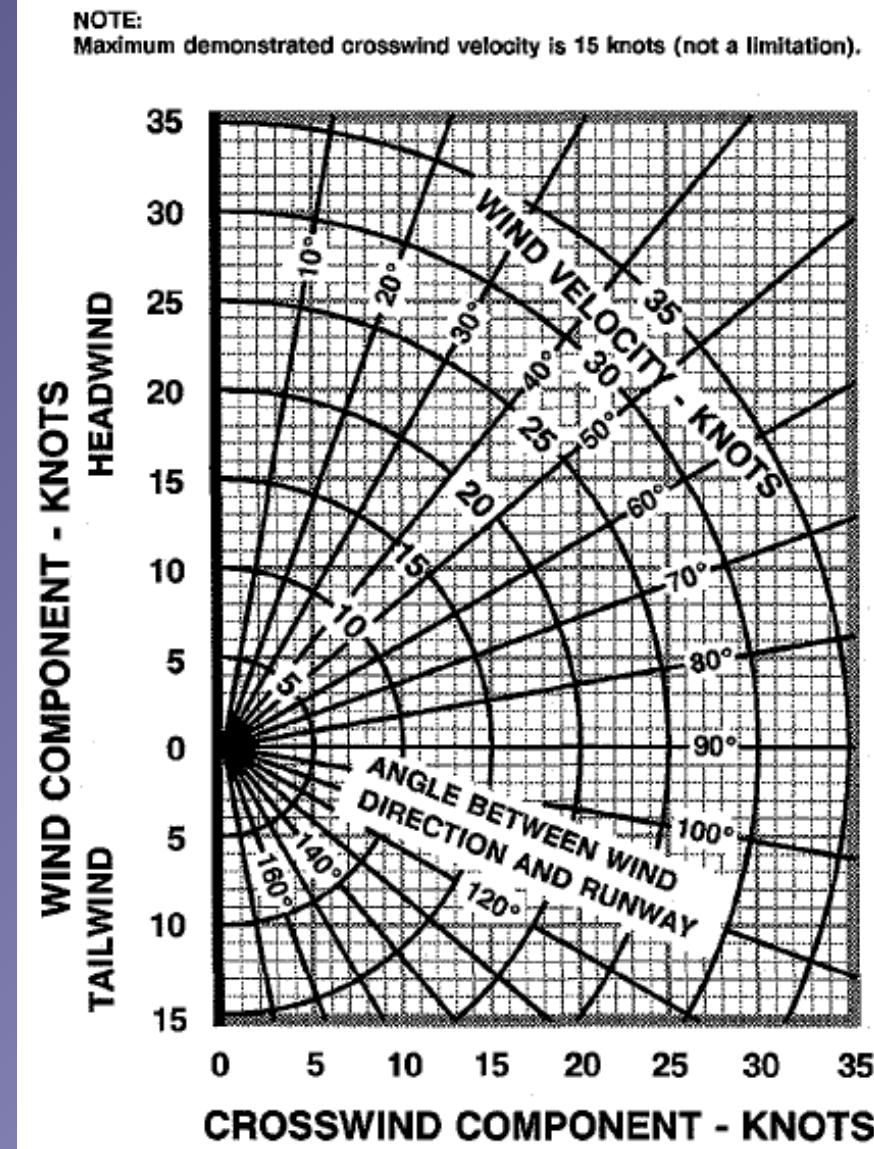
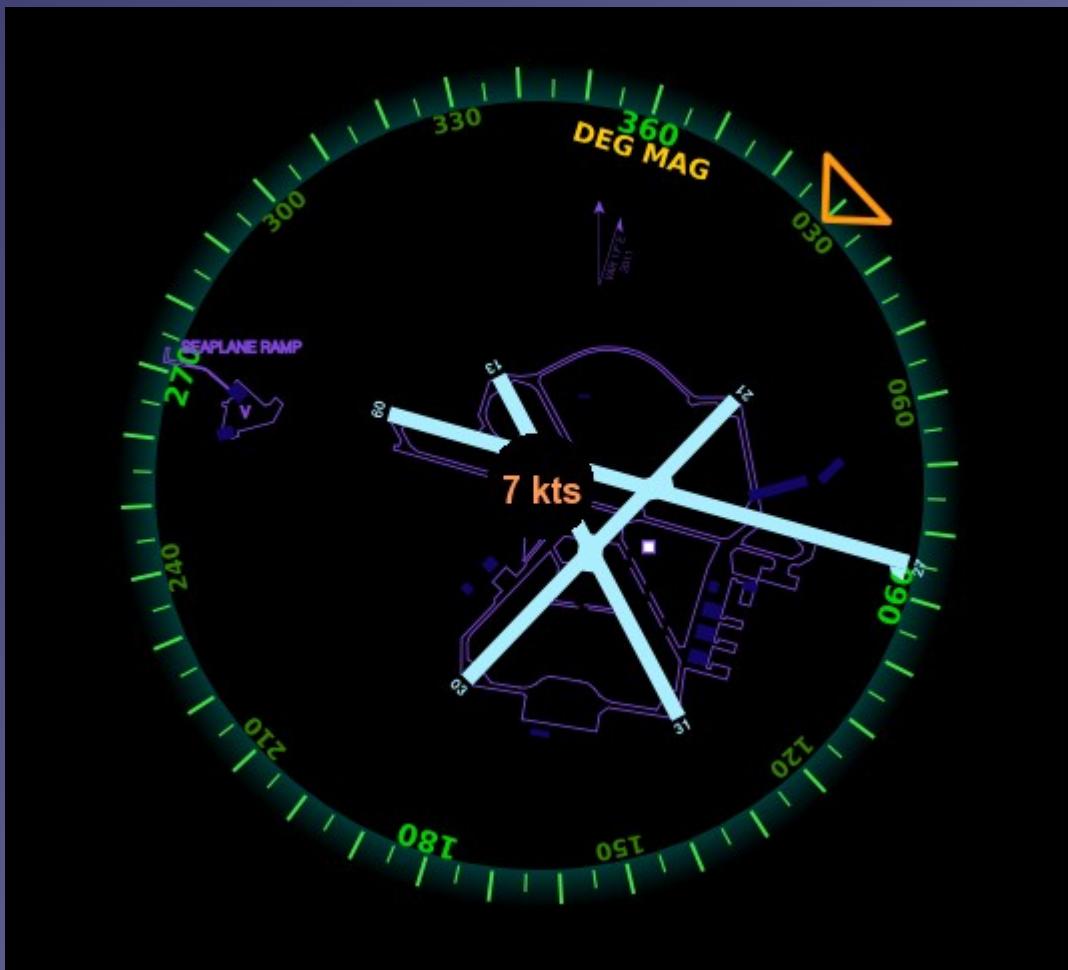
Crosswind Landing – Ground Roll



- Keep **straight** with **rudder** using **peripheral vision**
- Let **leeward wheel** settle and use **aileron** into the wind
- Hold **elevator** back-pressure allowing nose wheel to settle
- *Gently apply* **brakes** keeping **straight** towards **runway end**
- **Slow down** to taxi speed and **vacate runway**
- Cleanup – flaps, transponder, lights, time, clearance



Crosswind Component



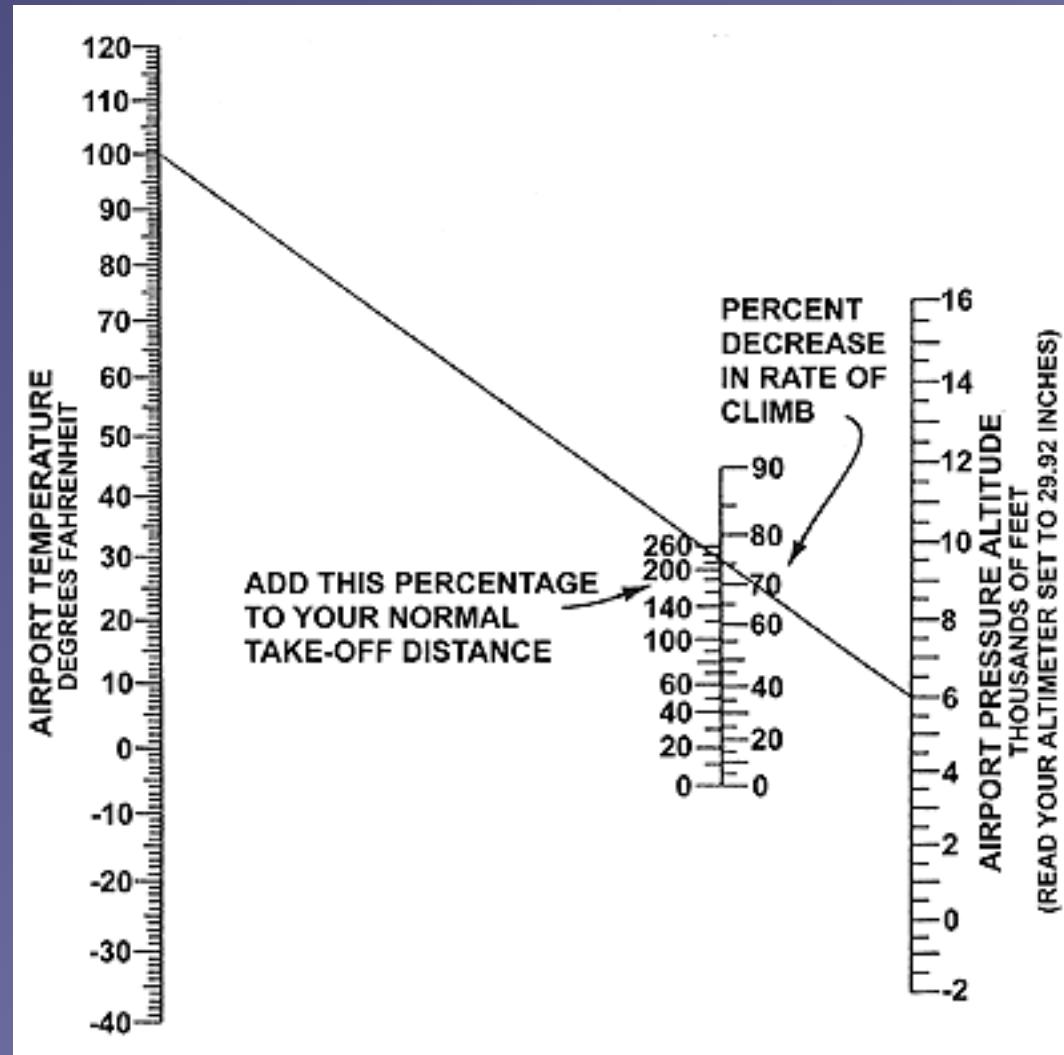


Landing Factors

- **Density** (Altitude, Pressure, Temperature, Humidity)
- **Surface Material** (Hard, Soft, Rough) and **Slope**
- Surface **Contamination** (Wet, Dry, Slush, Snow, Ice)
- **Wind** / Turbulence (Head-/Tailwind, Gusts, Windshear)
- **Wake** Turbulence
- **Obstacles**
- **Weight and Balance**
- Lifting Surfaces **Contamination**
- Ground Effect, Wheelbarrowing, Weathercocking



Density Altitude – Koch Chart





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High Density Altitude Operations



- Check environment and consult **performance** data in POH
- Pre-landing checks according to **checklists** in POH
- **High, hot, humid**



Special Landings



- Soft, short, high, hot, gusty, heavy, contaminated...



Wheelbarrowing



- Higher load on the nose-wheel
- Tendency to pivot about the nose wheel may result in ground loop
- Before pivoting: Ease back elevator to reduce weight
- After pivoting: Relax forward elevator and abort if not stopped



Summary / Quiz

- What are the factors affecting landings and the selection of a take-off type?
- Mentally perform a short-field landing and state all observations and actions.
- Mentally perform a soft-field landing and state all observations and actions.
- Mentally perform a crosswind landing and state all observations and actions.



Pre-Flight Briefing

- Exercise
- Training Area
- Departure and Arrival Procedures
- Weather Briefing / NOTAMs
- Aircraft and Documents
- Time and Fuel Requirements
- Safety Considerations and Responsibilities



Landing (Ex. 18, LP. 4, 5, 6, 14, 16, 18)

- Objective
- Review
- Motivation
- Howto
- Summary / Questions
- Preflight Briefing