



VICTORIA FLYING CLUB

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VICTORIA FLYING CLUB

Take-Off

- Definition and Motivation
- **Take-Offs**
 - **Normal, Short-Field, Soft-Field, Crosswind**
 - Factors



VICTORIA FLYING CLUB

Definition and Motivation

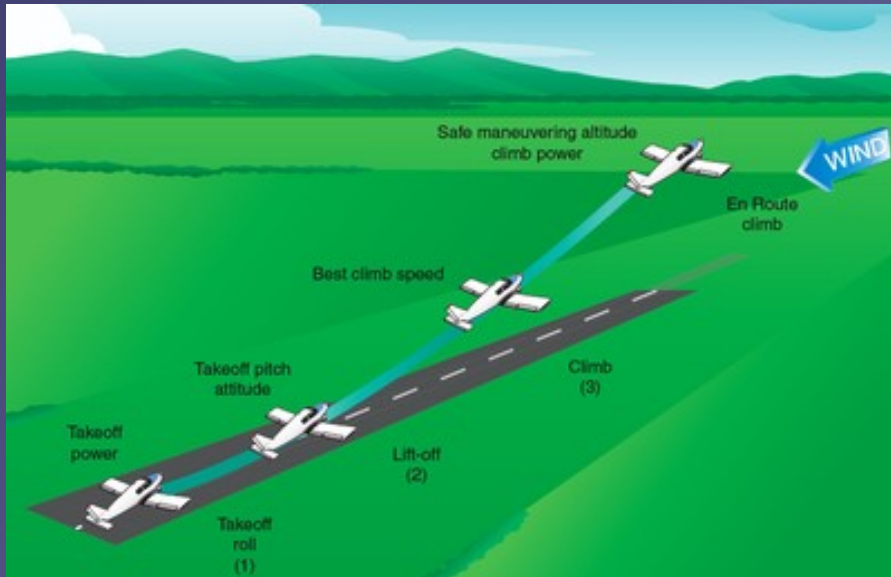


- *Act of leaving a supporting surface including the immediately preceding and following acts*
- Leaving the ground and **becoming airborne**
- Essential maneuver used in every single flight



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Normal Take-Off



- *Criteria:* hard uncontaminated surface, **long** runway, no obstacles, **low** density altitude, no or steady headwind
- Check environment and consult performance data in POH
- Pre-take-off checks according to checklists in POH
- Mixture **full rich**, lean for **maximum RPM** above **3000' DA**
- Passenger, departure and emergency briefings



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Normal Take-Off – Line Up



- **Check** approach sector and **callout** *Approach Sector Clear*
- Align with runway **centerline** using **rudder** and **brakes**
- Keep **nose-wheel centered** and **stop** before take-off run
- Crosscheck runway heading, magnetic compass, heading indicator



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Normal Take-Off – Run



Keep
Straight

Runway End



Lift Off



- Callout *Take-Off* before initiating take-off run
- Smoothly apply **full power** keeping **straight** with **rudder**
- Use **runway end** as reference for directional control
- Check RPM/ASI and callout *RPM Checked, Airspeed Alive*
- Continue to **accelerate** to lift-off speed ($V_r = 55 \text{ KIAS}$)
- Gently apply **elevator** back-pressure to lift off nose-wheel



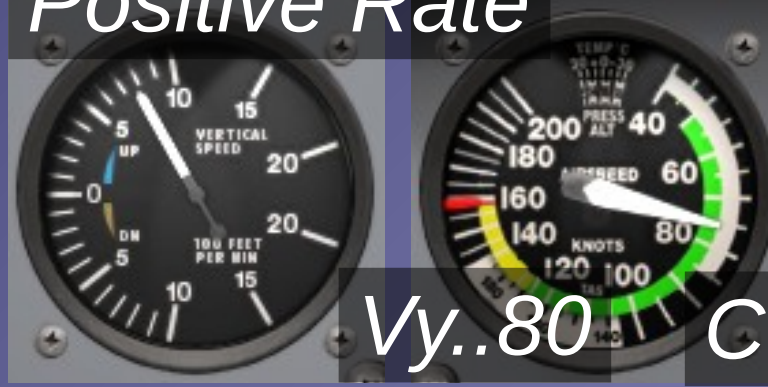
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Normal Take-Off – Initial Climb

Adjust Attitude



Positive Rate



Vy..80

Maintain Vy



Control Direction

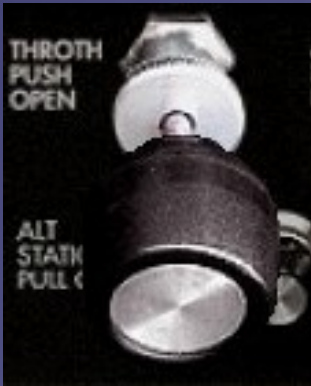
- Check VSI and callout *Positive Rate*
- Accelerate to **best rate of climb** airspeed ($V_y = 74 \text{ KIAS}$)
- Adjust and maintain nose-up **attitude** for **airspeed**
- **Trim** away elevator forward-pressure as required
- Maintain directional control and control yaw with **rudder**



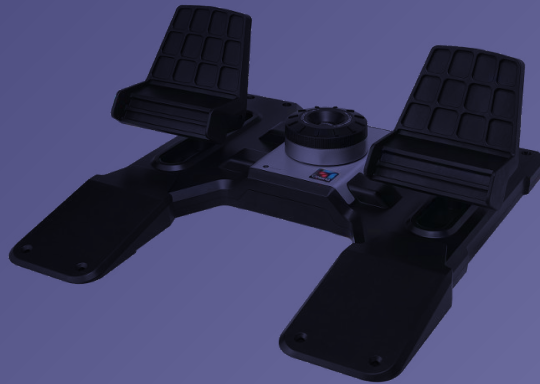
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Aborted / Rejected Take-Off

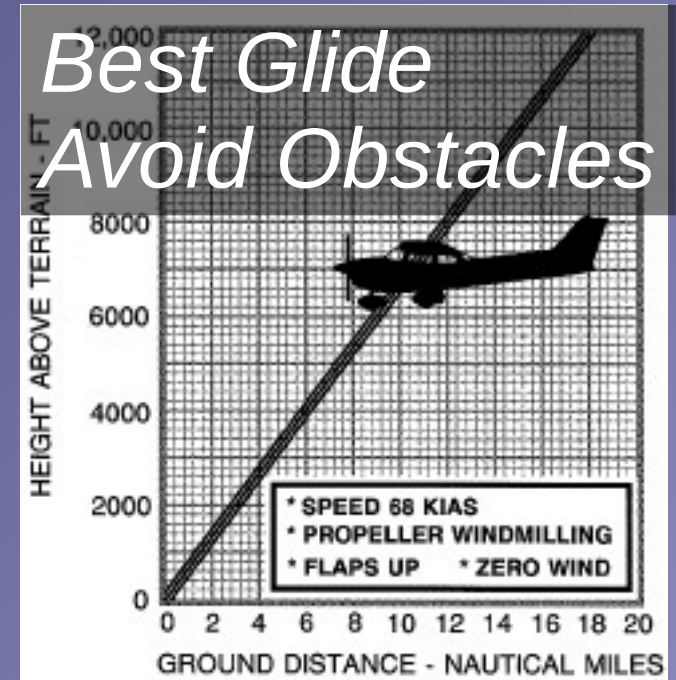
Power Idle



Apply Brakes



*Best Glide
Avoid Obstacles*

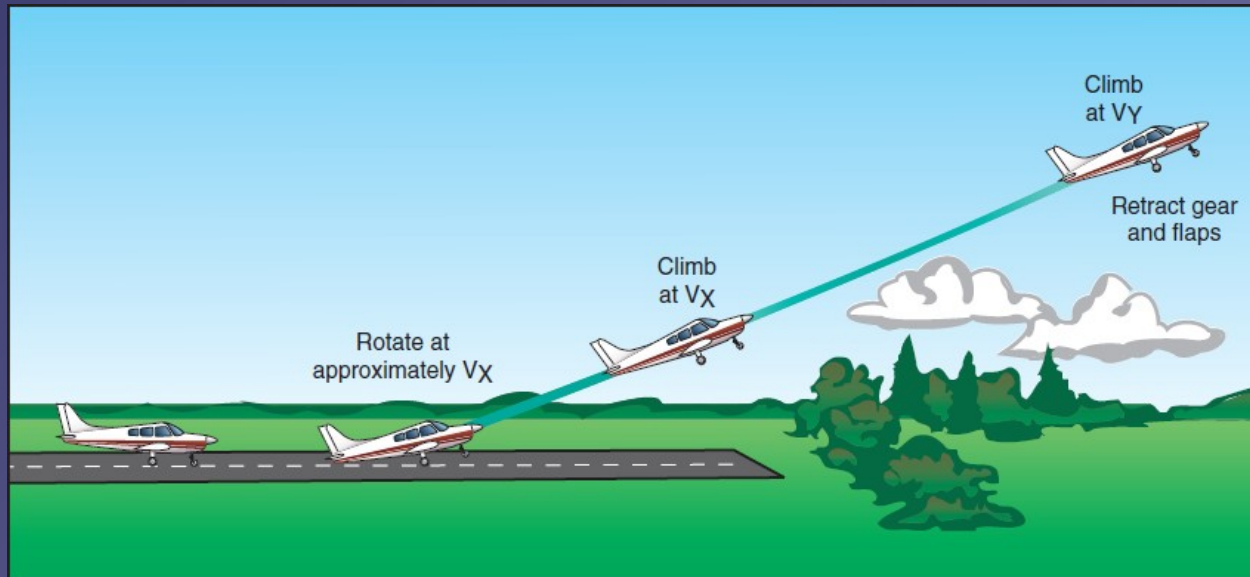


- *Reasons:* failures, traffic, animals, humans
- *During Take-Off Run:* power **idle**, apply **brakes**
- *Immediately after Take-Off:* **best glide airspeed (68 KIAS)**, avoid **obstacles**



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Short-Field Take-Off



- *Criteria:* hard uncontaminated surface, **short** runway, **obstacles**, **high** density altitude, no or steady headwind
- Check environment and consult performance data in POH
- Pre-take-off checks according to checklists in POH
- Mixture **full rich**, lean for **maximum RPM** above **3000' DA**
- Passenger, departure and emergency briefings



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Short-Field Take-Off – Line Up

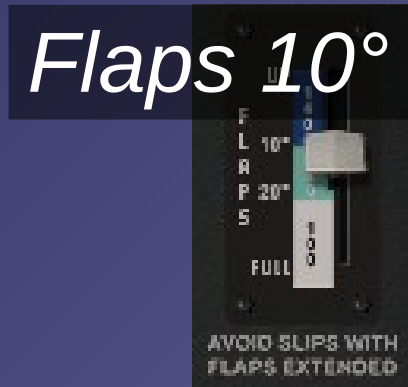


- **Check** approach sector and **callout** *Approach Sector Clear*
- Align with runway **centerline** using **rudder** and **brakes**
- Keep **nose-wheel centered** and **stop** before take-off run
- Crosscheck runway heading, magnetic compass, heading indicator



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Short-Field Take-Off – Run



- Set **flaps 10°** apply and **hold brakes**
- *Smoothly* apply **full power** and check static RPM (**2300-2400**)
- **Callout** *Take-Off* before initiating take-off run
- Release **brakes**
- Apply *slight* elevator back-pressure
- Check RPM/ASI and **callout** *RPM Checked, Airspeed Alive*
- Keep straight with **rudder** accelerating to lift-off (**$V_r = 44..51$ KIAS**)





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Short-Field Take-Off – Initial Climb

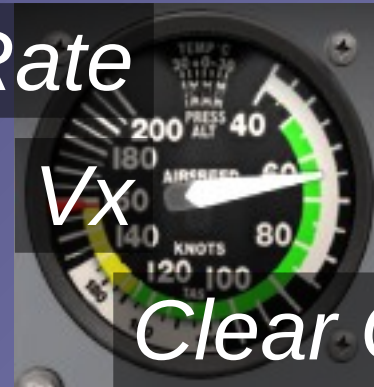
Adjust Attitude



Positive Rate



V_x



Maintain V_x

Clear Obstacles, V_y



- Check VSI and callout *Positive Rate*
- Accelerate to **best angle of climb** airspeed ($V_x = 62 \text{ KIAS}$)
- Adjust and maintain **nose-up attitude** for **airspeed** and **trim**
- Maintain directional control and control yaw with **rudder**
- Accelerate to **best rate of climb** airspeed ($V_y = 74 \text{ KIAS}$) after **obstacles** cleared and **trim**
- Retract **flaps** above **500' AGL** in **white arc**



VICTORIA FLYING CLUB

Take-Off Performance

SHORT FIELD TAKEOFF DISTANCE AT 2550 POUNDS

CONDITIONS:

Flaps 10°
Full Throttle Prior to Brake Release
Paved, level, dry runway
Zero Wind
Lift Off: 51 KIAS
Speed at 50 Ft: 56 KIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
S. L.	860	1465	925	1575	995	1690	1070	1810	1150	1945
1000	940	1600	1010	1720	1090	1850	1170	1990	1260	2135
2000	1025	1755	1110	1890	1195	2035	1285	2190	1380	2355
3000	1125	1925	1215	2080	1310	2240	1410	2420	1515	2605
4000	1235	2120	1335	2295	1440	2480	1550	2685	1660	2880
5000	1355	2345	1465	2545	1585	2755	1705	2975	1825	3205
6000	1495	2605	1615	2830	1745	3075	1875	3320	2010	3585
7000	1645	2910	1785	3170	1920	3440	2065	3730	2215	4045
8000	1820	3265	1970	3575	2120	3880	2280	4225	2450	4615

NOTES:

1. Short field technique as specified in Section 4.
2. Prior to takeoff from fields above 3000 feet elevation, the mixture should be leaned to give maximum RPM in a full throttle, static runup.
3. 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.
4. For operation on dry, grass runway, increase distances by 15% of the "ground roll" figure.

SHORT FIELD TAKEOFF DISTANCE AT 2400 POUNDS

CONDITIONS:

Flaps 10°
Full Throttle Prior to Brake Release
Paved, level, dry runway
Zero Wind
Lift Off: 48 KIAS
Speed at 50 Ft: 54 KIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
S. L.	745	1275	800	1370	860	1470	925	1570	995	1685
1000	810	1390	875	1495	940	1605	1010	1720	1085	1845
2000	885	1520	955	1635	1030	1760	1110	1890	1190	2030
3000	970	1665	1050	1795	1130	1930	1215	2080	1305	2230
4000	1065	1830	1150	1975	1240	2130	1335	2295	1430	2455
5000	1170	2015	1265	2180	1360	2355	1465	2530	1570	2715
6000	1285	2230	1390	2410	1500	2610	1610	2805	1725	3015
7000	1415	2470	1530	2685	1650	2900	1770	3125	1900	3370
8000	1560	2755	1690	3000	1815	3240	1950	3500	2095	3790

NOTES:

1. Short field technique as specified in Section 4.
2. Prior to takeoff from fields above 3000 feet elevation, the mixture should be leaned to give maximum RPM in a full throttle, static runup.
3. 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.
4. For operation on dry, grass runway, increase distances by 15% of the "ground roll" figure.



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Soft-Field Take-Off



- *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-take-off checks according to **checklists** in POH
- Mixture **full rich**, lean for maximum RPM above **3000' DA**
- Passenger, departure and emergency briefings



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Soft-Field Pre-Take-Off

Checks	
PREFLIGHT INSPECTION	
1. Aircraft documents	CHECK
2. Fire extinguisher	CHECK
3. First Aid Kit	CHECK
4. Control Lock	RECHECK
5. Flight controls and brakes	CHECK
6. Ignition switch	OFF
7. Electrical equipment, radios	ON
8. Master switch	DOWN
9. Fuel gauges	CHECK QUANTITY
10. Master	OFF
11. External inspection	OFF
PASSENGER BRIEFING	
1. Doors, windows	DOWN
2. Seatbelts	DOWN
3. Fire Extinguisher	DOWN
4. First Aid Kit	DOWN
5. EL	DOWN
6. Controls	DOWN
7. Smoking	DOWN
8. Life Vests	DOWN
9. Loose Articles - Secure	DOWN
ENGINE START	
1. Documents, safety equipment and baggage	COMPLETE
2. Passenger Briefing	COMPLETE
3. Seatbelts	SECURE
4. Brakes	SET
5. Avionics Power Switch	CHECK IN
6. Circuit Breakers	CHECK IN
7. Fuel valve	LEFT
8. Mixture	RICH
9. Throttle	SET
10. Carb Heat	ON
11. Master	ON
12. Beacon Light	ON
13. Primer	As Req & locked
14. Propeller area	CLEAR
15. Mags	START
16. Throttle	1000 RPM
17. Oil Pressure	CHECK
AFTER START	
1. Avionics Power Switch	ON
2. Flaps	RETRACT
3. Nav Lights	ON
4. Transponder	STANDBY
5. Radios	SET
6. ATIS	COPY
7. Flight Instruments	SET
8. Fuel Valve	RIGHT
9. Tail clearance	RIGHT
10. Brakes	CHECK
11. Flight Instruments	CHECK
BEFORE TAKE OFF	
1. Belts, Doors, Windows, Seats	SECURE
2. Primer	LOCKED
3. Master	ON
4. Mags	BOTH
5. Carb Heat	COLD
6. Mixture	RICH
7. Flaps	AS REQUIRED
8. Fuel	SET FOR T/O
9. Fuel	BOTH
10. Flight Instruments	CHECK
11. Flight Controls	FREE & CORRECT
12. Radio	SET
13. Take off clearance	OBTAIN
LINE UP	
1. Time off	RECORD
2. Transponder	ALT (check code)
3. Landing Light	ON
4. Strobe Lights	ON
BEFORE LANDING	
1. Primer	LOCKED
2. Master	ON
3. Mags	BOTH
4. Carb Heat	ON
5. Mixture	RICH
6. Fuel Valve	BOTH
7. Brakes	CHECK
8. Seats, Belts, Harnesses	SECURE
AFTER LANDING	
1. Take off clearance	OBTAIN
2. Transponder	OFF
3. Carb Heat	OFF
4. Wing Flaps	UP
5. Strobe Lights	OFF
6. Landing Lights	OFF
SHUT DOWN	
1. Flight Instruments	CLOSED
2. Radios	131.5 (check tone)
3. Avionics Power	OFF
4. Nav Lights	OFF
5. Live mag check at idle	OFF
6. Mixture	Idle Cut Off
7. Mags	OFF
8. Master	OFF

Briefings

Mixture

Flaps 10°



- Complete pre-take-off checks on **supporting** surface
- Setup aircraft for **rolling** take-off on soft surface
- Departure and emergency briefings, **mixture**, **flaps**



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Soft-Field Take-Off – Line Up

Relieve Nose-Wheel and Keep Rolling



- Apply and **hold** elevator **back-pressure** to **relieve nose-wheel**
- **Check** approach sector and callout *Approach Sector Clear*
- Perform **rolling** take-off – do **not stop** after centerline alignment
- Crosscheck runway heading, magnetic compass, heading indicator



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Soft-Field Take-Off – Run



Keep
Straight



Runway End



- Callout *Take-Off* before initiating take-off run
- Smoothly apply **full power** keeping **straight** with **rudder**
- Use **runway end** as reference for directional control
- Apply slight elevator **back-pressure** to **raise nose-wheel**
- Check RPM/ASI and callout *RPM Checked, Airspeed Alive*
- Lift off at **slowest speed** possible commensurate



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Soft-Field Take-Off – Initial Climb

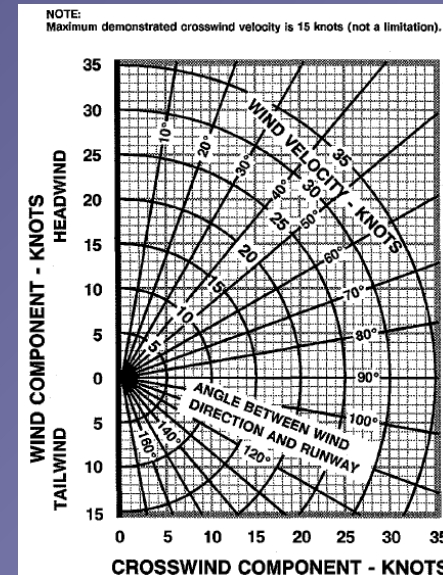
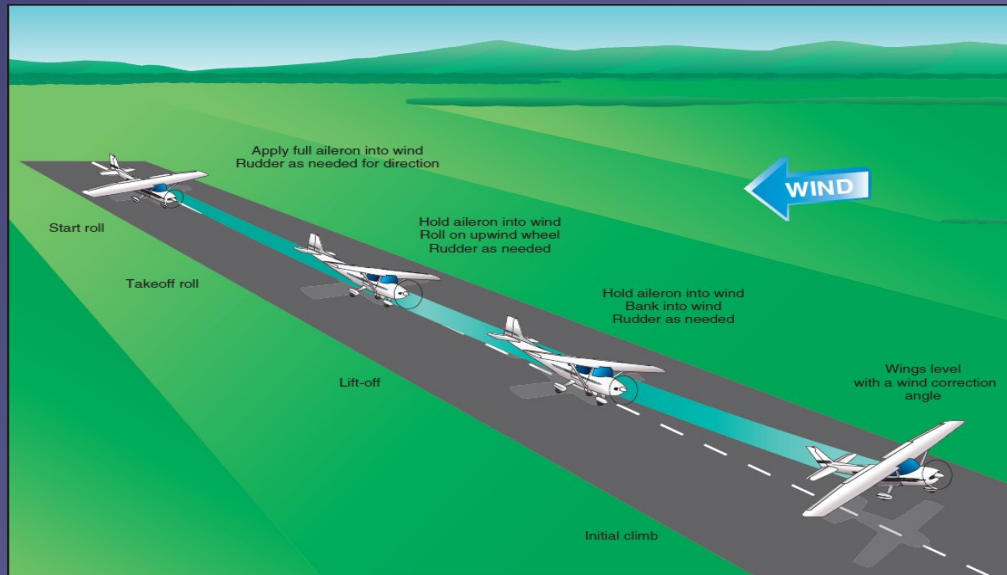


- Level-off and **remain in ground effect** after lift-off
- Accelerate in **ground effect** to desired **climb airspeed** (V_x , V_y)
- At **best angle of climb** ($V_x = 62 \text{ KIAS}$) transition into climb and
- Accelerate to **best rate of climb** ($V_y = 74 \text{ KIAS}$)
- Retract **flaps** in **white arc** when above **500' AGL**



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Crosswind Take-Off



- Criteria: **steady** or **gusty crosswind** component (windshear)
- Check environment and consult performance data in POH
- Pre-take-off checks according to checklists in POH
- Maximum demonstrated crosswind component **15 knots**
- Mixture **full rich**, lean for **maximum RPM** above **3000' DA**
- Passenger, departure and emergency briefings



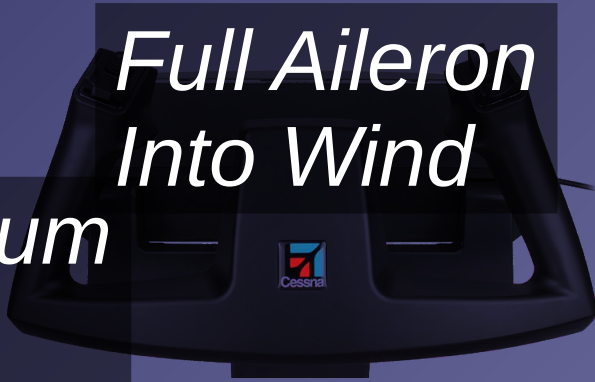
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Crosswind Take-Off – Run



*Minimum
Flaps*

*Full Aileron
Into Wind*



Keep Straight

*Reduce Aileron,
Briskly Lift Off*



- Use **minimum flap** setting required and **hold full ailerons** into the wind
- **Callout** *Take-Off* before initiating take-off run
- *Smoothly* apply **full power** keeping **straight** with **rudder**
- Use **runway end** as reference for directional control
- **Check** RPM/ASI and **callout** *RPM Checked, Airspeed Alive*
- Continue to **accelerate** to *slightly higher lift-off speed*
- *Gradually* **reduce aileron input** – some ailerons required at lift-off
- *Briskly* apply **elevator** back-pressure to lift off



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Crosswind Take-Off – Initial Climb



Level Wings



Coordinated Turn into Wind

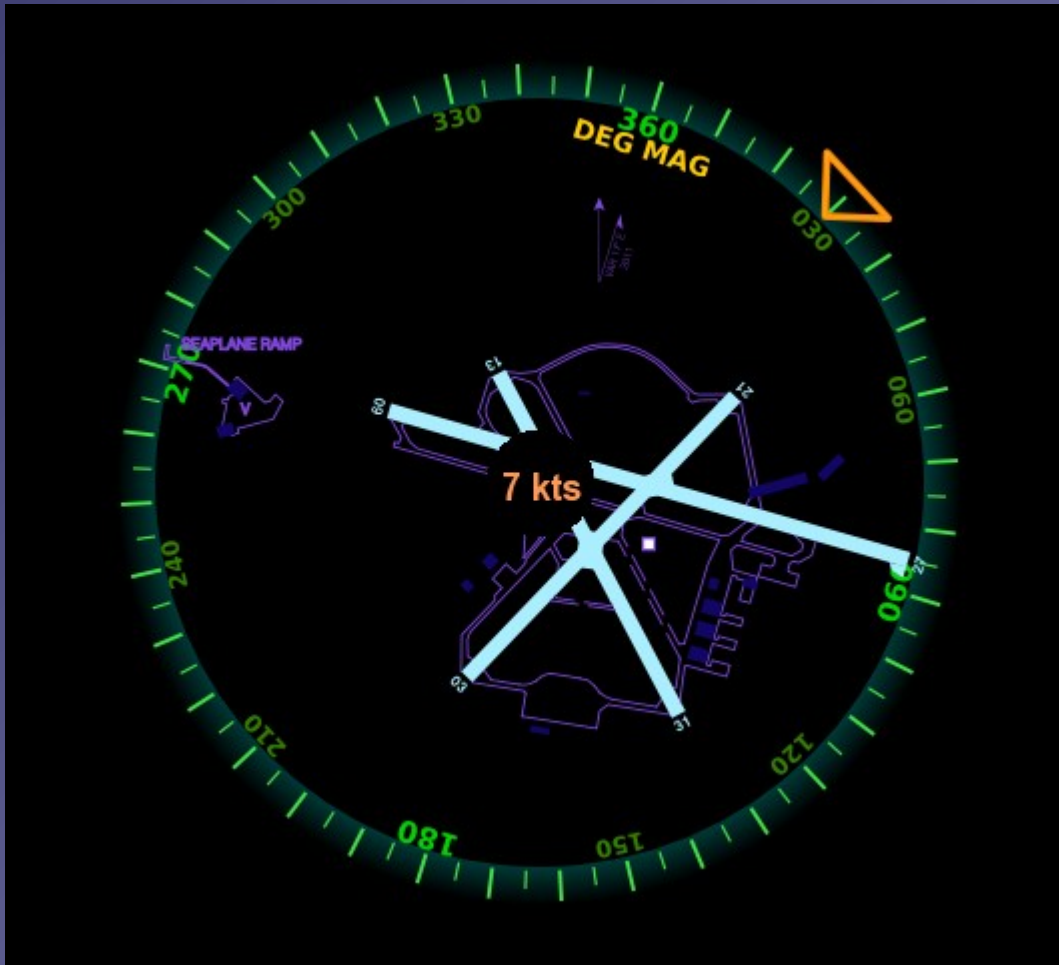


- Check VSI and callout *Positive Rate*
- **Level wings** when airborne
- Perform **coordinated turn** into the wind (crab) maintaining desired **track**
- **Accelerate** to desired **climb airspeed** (V_x , V_y)
- Adjust and maintain nose-up **attitude** for **airspeed** and **trim**
- Retract **flaps** in **white arc** above **500' AGL**



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Crosswind Component



NOTE:

Maximum demonstrated crosswind velocity is 15 knots (not a limitation).

