Knowing your aircraft well is essential to safe flying. These flash cards are designed to help pilots of all experience levels gain that knowledge. The blanks on the cards should be filled out after reviewing the pilot’s operating handbook (POH) and other relevant material.

Professional pilots often use aircraft-specific flash cards as a way of reviewing speeds, profiles, systems, and emergency procedures any time and anywhere. Now you can too.
**Fuel Capacity**

Total: ____________________________gal  Usable: ____________________ gal

Max Fuel Imbalance: ____________ gal

**Note:** Some aircraft have long range and/or tip tanks. Make sure you use the correct “usable” fuel amounts for your aircraft’s endurance calculations.
Fuel System

Circle the type(s) of fuel system(s) in your aircraft:

- [ ] Gravity-fed
- [ ] Pump Driven
- [ ] Fuel-injected
- [ ] Carbureted
Fuel Drains & Locations

Number of Drains: ____________________________________________

Locations: __________________________________________________
___________________________________________________________
___________________________________________________________
___________________________________________________________

Note: Most of the time, drains are located under the wings and nose.
Fuel Type & Weight

Type (avgas, jet, etc.): _________________________________________

Weight: ____________________________________________________ lb/gal

Color: ______________________________________________________
Oil

Minimum: ___________________________________________________

Maximum: ___________________________________________________

Grade: _____________________________________________________

**Note:** Your aircraft may require different types and grades of oils during the engine break-in period and during warmer and colder weather.
Engine

Make: __________________________  Model: _____________________

Horsepower: ____________________  Max RPM: ___________________

Note: Engine model numbers can tell you a lot. For example, a C172R has a Lycoming IO-360 engine. The “I” means fuel injected and the “O” means the cylinders are horizontally opposed. The “360” refers to cubic inches of displacement, describing the physical size of the engine.
Electrical System

Alternator Voltage: ___________________ Battery Voltage: ____________

Alternator Amperage: _________________________________________

Abnormal Indications & Warnings: _______________________________

________________________________________________________________
________________________________________________________________

Note: Electrical component amperage is listed on the faces of the circuit breakers. Turning OFF the components with the largest draw will lengthen the life of the battery following an alternator failure.
Magneto Check

Runup RPM: ________________________________________________

Maximum RPM Drop: _________________________________________

Max Difference Between Left & Right: ____________________________

Note: Question on how magnetos work? Check out the Air Safety Institute’s Engine & Propeller online course at airsafetyinstitute.org/engineprop.
Nosewheel Steering

☐ Steerable through _________________ degrees

or

☐ Free Castering

Note: This is important when maneuvering the aircraft on the ground with a tug and/or tow bar. Look for markings on the nosewheel strut, wheel pant, or cowling that indicate the steering limit. This does not apply if the nosewheel is free castering.
### Antennas

<table>
<thead>
<tr>
<th>Type:</th>
<th>Location:</th>
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**Note:** Aircraft antenna locations vary based on the aircraft make/model and equipment installed.
Maximum Weights

Maximum Ramp Weight: _________________________________ lb

Maximum Takeoff Weight: _________________________________ lb

Maximum Landing Weight: _________________________________ lb

Note: Maximum ramp weight includes the weight of fuel needed to taxi and complete the runup. This is why the maximum ramp weight may exceed the maximum takeoff weight in the normal category.
$V_{\text{NE}}$ - Never Exceed Speed

Note: $V_{\text{NE}}$ is denoted by the red line. Exceeding $V_{\text{NE}}$ may cause severe structural damage or failure of your aircraft.
**V\textsubscript{NO} - Maximum Structural Cruising Speed**

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Note: \( V\textsubscript{NO} \) is shown where the green and yellow arcs meet. It should not be exceeded except in smooth air.
**Vₐ - Maneuvering Speed**

At Max. Gross Weight _____________________________ knots

**Note:** $V_a$ is the maximum speed at which you may apply full control deflections without over-stressing the airplane. $V_a$ decreases as weight decreases. Pilots should fly below this speed in severe turbulence.
$V_Y$ - Best Rate of Climb

Note: $V_Y$ delivers the greatest altitude gain over a given period of time. In other words, $V_Y$ delivers you the most feet/minute.
**$V_x$ - Best Angle of Climb**

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**Note:** $V_X$ delivers the greatest altitude gain over a given distance.
**V<sub>R</sub> - Rotation Speed**

Normal: ____________________________ knots

Short-field: ________________________ knots

Soft-field: _________________________ knots

**Note:** On some aircraft, this is **not** marked on the airspeed indicator and will change depending on the aircraft's weight and takeoff procedure.
### $V_{FE}$ - Maximum Flap Extension Speed

<table>
<thead>
<tr>
<th>Increment</th>
<th>Speed (knots)</th>
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**Note:** Flap operating range is usually shown on the airspeed indicator by the white arc. Often, the first flap extension speed is above the white arc. Check your POH for exact values.
**V<sub>SO</sub> - Stall Speed—Landing Configuration**

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**knots at 0° Bank**

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**knots at 60° Bank**

**Note:** $V_{SO}$ is shown on the bottom of the white Arc.

**Remember:** $V_{SO}$ = “Stuff Out,” which means gear and flaps extend.
**V_{S1} - Stall Speed—Clean**

**Note:** $V_{S1}$ is shown on the bottom of the green arc.

**Remember:** $V_{S1} = \text{"Stuff In," which means gear and flaps retracted.}$
Normal Takeoff Procedures

Flap Setting: ____________________________________________

Rotation Speed: _________________________________________ knots

Climb Speed: ___________________________________________ knots
Normal Landing Procedures

<table>
<thead>
<tr>
<th>Leg</th>
<th>Power Setting</th>
<th>Flap Setting</th>
<th>Airspeed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crosswind:</td>
<td>_____________</td>
<td>_____________</td>
<td>_____________ knots</td>
</tr>
<tr>
<td>Downwind:</td>
<td>_____________</td>
<td>_____________</td>
<td>_____________ knots</td>
</tr>
<tr>
<td>Base:</td>
<td>_____________</td>
<td>_____________</td>
<td>_____________ knots</td>
</tr>
<tr>
<td>Final:</td>
<td>_____________</td>
<td>_____________</td>
<td>_____________ knots</td>
</tr>
</tbody>
</table>

**Note:** Memorizing proper power settings and airspeeds for each segment of the approach will help stabilize the approach and landing.
Short-Field Landing Procedures

<table>
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<tr>
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<tr>
<td>Final</td>
<td>_____________</td>
<td>___________</td>
<td>___________ knots</td>
</tr>
</tbody>
</table>

**Note:** The objective of the short-field landing is to transfer the aircraft’s weight from the wings to wheels as soon as possible. Touch down as slowly as possible, while simultaneously applying maximum braking.
Short-Field Takeoff Procedures

Flap Setting: ________________________________________________

Rotation Speed: ______________________________________________

Climb Speed: ________________________________________________ knots

Flap Retraction: ________________________________________________ knots

**Note:** The objective of the short-field takeoff is to transition from the takeoff roll to best-angle-of-climb speed as quickly, efficiently, and safely as possible. This generally means using minimal runway length, neutral elevator for low drag, proper flap setting, and avoiding lifting off too soon.
## Soft-Field Landing Procedures

<table>
<thead>
<tr>
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<th>Power Setting</th>
<th>Flap Setting</th>
<th>Airspeed</th>
<th></th>
</tr>
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<tbody>
<tr>
<td>Crosswind</td>
<td>_____________</td>
<td>_____________</td>
<td>_____________</td>
<td>knots</td>
</tr>
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<tr>
<td>Final</td>
<td>_____________</td>
<td>_____________</td>
<td>_____________</td>
<td>knots</td>
</tr>
</tbody>
</table>

**Note:** The objective of a soft-field landing is to have the wings support the aircraft’s weight as long as possible, which helps minimize the chance of sinking in the soft soil. Touch down as softly as possible, and avoid unnecessary braking. You may need to add power in the flare to avoid a hard landing.
Soft-Field Takeoff Procedures

Climb Speed: ________________________________________________ knots

Flap Setting: ________________________________________________

Flap Retraction: ______________________________________ (airspeed or altitude)

Note: Hold full aft elevator while taxiing into position and avoid unnecessary stopping or braking. Smoothly advance the throttle while maintaining back pressure on the yoke, and then slowly reduce the amount of back pressure after the nose wheel lifts off the ground as speed increases. After the aircraft becomes airborne, adjust its pitch attitude to remain in ground effect until reaching the proper climb speed.
Best Glide Speed

Note: Most light general aviation aircraft will glide about two miles for every 1,000 feet of altitude. Usually you'll want to extend the glide as long as possible by strictly maintaining the best glide speed and keeping the aircraft's configuration clean (e.g., gear and flaps up, feathered prop).
Maximum Demonstrated Crosswind Component

Note: This is the maximum crosswind in which the aircraft was tested during certification. Although it is not technically a limitation, it should be treated as one as directional control effectiveness decreases as crosswind velocity increases.
Types of Operations

- Night
- IFR
- Known Icing

**Note:** Even if an aircraft has deice or anti-ice equipment, it may not be certified for flight into known icing conditions. In fact, few light general aviation aircraft have this certification. Either way, having this equipment does not guarantee prolonged, safe flights in icing conditions.
Emergency Procedures: Engine Failure

Memory Items: ________________________________________________
___________________________________________________________
___________________________________________________________
___________________________________________________________
___________________________________________________________
___________________________________________________________

Emergency Procedures: Engine Failure

Memory Items: ________________________________________________
___________________________________________________________
___________________________________________________________
___________________________________________________________
___________________________________________________________
___________________________________________________________
Emergency Procedures: Engine Fire on Start

Memory Items: ______________________________________________
___________________________________________________________
___________________________________________________________
___________________________________________________________
___________________________________________________________
___________________________________________________________
Memory Items: ______________________________________________
_________________________________________________________
_________________________________________________________
_________________________________________________________
_________________________________________________________
_________________________________________________________

Emergency Procedures: Engine Fire in Flight
Emergency Procedures: Electrical Fire in Flight

Memory Items: ______________________________________________
___________________________________________________________
___________________________________________________________
___________________________________________________________
___________________________________________________________

Note: Electrical fires are usually smelled long before they are seen.
Emergency Procedures: Inadvertent Icing Encounter

**Note:** Due to lack of anti- or deice equipment, most light general aviation aircraft are not approved for flight into icing conditions. If the aircraft is not equipped and certified for icing, you must exit icing conditions immediately. If you have an inadvertent icing encounter in an aircraft without windshield anti-ice, adjust the defroster setting to provide maximum heat to help keep a portion of the windshield clear. Turn off the cabin heat, if that will provide more heat to the windshield. Remember to turn on the pitot heat, as well.
Spin Recovery

Memory Items: ______________________________________________
___________________________________________________________
___________________________________________________________
___________________________________________________________
___________________________________________________________

Note: Some pilots commit to memory the PARED acronym, which means Power-reduce, Ailerons-neutral, Rudder-full opposite, Elevator-forward to break the stall, and Dive-recover. Consult your aircraft’s POH for specific procedures.