



# **PROCEDURES GUIDE**

## **FLIGHT MANEUVERS for the SPORT PILOT**

\* Author's Note: Whereas this procedures guide has been written for a specific application, it can easily be modified to fit many different make/model aircraft and locations.

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# **FORWARD**

This outline guide is solely intended to aid the student pilot learning to fly a Sport Cruiser at the Columbia County Airport. It outlines procedures used in flying the different maneuvers required for the Sport Pilot Certificate.

It is **not** intended to be a “how to” manual, but to serve as a source of both preview as well as review to aid the student pilot in visualizing the procedures to be taken as the various maneuvers are flown.

It is not a stand-alone guide or manual, but is intended to be used in conjunction with both flight and ground instruction, as well as with the “Sport Cruiser Flight and Operating Manual”



## **NORMAL TAKEOFF**

1. Taxi to runway centerline
2. H.A.T. check (heading, altimeter, transponder)
3. Check windsock, trees, etc. for wind direction/speed
4. Apply power smoothly to full takeoff power and hold
5. Hold slight back pressure on stick
6. As airplane accelerates: maintain centerline (steering with rudder pedals); check airspeed alive and engine instruments (5000 RPM, oil pressure, )
7. As airplane gets light (approx. 55KIAS) apply back pressure to stick and rotate (take off)
8. Ease stick pressure to trimmed airspeed (65 KIAS)
9. Apply right rudder as necessary to counteract left turning tendencies.
10. At 200' AGL (400' MSL) raise flaps, maintain 70 KIAS, until 1000' AGL then accelerate to KIAS

## **CROSSWIND TAKEOFF**

1. #1,2,3 as above
2. Apply aileron deflection into the wind; i.e. if the wind is from the right hold the stick full to the right
3. Apply power smoothly to full takeoff power and hold.
4. As airplane accelerates and ailerons become effective, reduce aileron deflection, so that there is only a slight bank at rotation
5. Maintain runway centerline by steering with rudder pedals
6. Rotate as in normal take off
7. As airplane breaks ground allow it to “weathervane” into the wind, holding right rudder as necessary to counteract left turning tendencies
8. Maintain crosswind correction to maintain extended runway centerline
9. Accelerate as in normal takeoff

## **CLIMB**

1. Maintain full power
2. Set pitch attitude to result in 70 KIAS
3. Check engine instruments (oil temperature, oil pressure, CHT temperature)
4. Above 1000' AGL accelerate to 80 KIAS

## **LEVEL OFF FROM CLIMB**

1. Anticipate lowering the nose to result in level flight at pre-determined altitude
2. Hold nose down to maintain altitude as airplane accelerates. This will require increasing forward pressure. Do not reduce power yet!
3. Accelerate to 105 KIAS
4. Reduce power to cruise power (4,800 RPM)
5. Set trim to maintain airplane level attitude (nose down trim)



## **DESCENT**

1. Reduce power (4000 RPM); power will determine rate of descent
2. Set pitch to maintain 105 KIAS
3. Trim as necessary to maintain airplane attitude

## **LEVEL OFF FROM DESCENT**

1. Approx. 50' above target altitude increase power to cruise power (4,800 RPM)
2. Hold forward stick pressure to maintain altitude and accelerate to cruise airspeed (105 KIAS)
3. Set trim to maintain airplane attitude and level altitude

## **POWER OFF STALL**

1. Reduce power (3400 RPM)
2. Maintain altitude with back stick pressure
3. Below 75 KIAS lower flaps
4. Trim for 65 KIAS glide as you begin gentle descent
5. Slowly reduce throttle to power full off
6. Pull stick to yield slightly high nose attitude.
7. Continue to add back stick pressure until stall break

## **AND RECOVERY**

1. At stall break, simultaneously reduce back stick pressure and add full takeoff power
2. Raise flaps to position 20°
3. Pitch up to achieve 65 KIAS
4. Clean up flaps
5. Level off and resume normal cruise

## **POWER ON STALL**

1. Reduce power to 3400 RPM
2. Add back pressure to stick to maintain altitude, reduce airspeed to below 65 KIAS
3. Once airspeed is below 65 KIAS add full takeoff power; pitch up
4. Maintain nose up attitude until stall occurs. Be sure to add sufficient right rudder to maintain coordinated flight

## **AND RECOVERY**

1. Reduce back pressure on stick, while maintaining full power



## SLOW FLIGHT

1. Reduce power (3400 RPM)
2. Maintain altitude with back pressure on stick
3. Below 75 KIAS add full flaps
4. Trim nose up
5. Maintain altitude / heading continually
6. Power controls altitude
7. Pitch controls airspeed
8. Increase right rudder as necessary to maintain coordinated flight
9. Only enough bank in turns to result in standard rate turn

## TO RESUME NORMAL CRUISE FROM SLOW FLIGHT

1. Add full power
2. Raise flaps to 20°
3. Add forward stick pressure to maintain altitude, and accelerate
4. Trim nose down as necessary
5. Raise flaps before exceeding 75 KIAS
6. Accelerate to cruise speed (105 KIAS)
7. Reduce power to cruise power (4800)
8. Adjust trim as necessary to maintain level flight

## TAKEOFFS & LANDINGS – TRAFFIC PATTERN

1. H.A.T. check (Heading, Altimeter set to field elevation, Transponder set to altitude)
2. Rotate at 55 KIAS (slight back pressure on stick)
3. 200' AGL (400' MSL) flaps up
4. Climb at 70 KIAS
5. 1,200' MSL turn crosswind, while checking for traffic \*
6. Maintain 1,200' MSL while reducing power to 4800 RPM
7. Turn downwind 1/2 mile offset from runway, while checking for traffic
8. **RELAX & ENJOY**, but be ever vigilant for TRAFFIC
9. Abeam touch down point:
  - a. reduce power to 3400 RPM
  - b. below 75 KIAS flaps to position 20° as necessary
  - c. trim for 65 KIAS
10. Turn base leg when 1/2 mile beyond runway end (If downwind has been flown 1/2 mile offset from runway, the runway threshold will now be behind and to the left at a 45° angle)
11. RIGHT – check for traffic on final  
CENTER – check and correct for wind drift  
LEFT – look for runway  
Make adjustments for altitude with power; for airspeed with Pitch; DO NOT EXCEED 75 KIAS!



12. Time turn so that on rollout from turn you are aligned on the extended runway centerline
13. Lower flaps to full
14. Trim for 65 KIAS
15. Final trim for airspeed
16. If crosswind: Bank controls drift; rudder pedals control heading

\* When departing runway 21 plan crosswind so as to not overfly nursing home or trailer park.

## THE LANDING

Landing an airplane for the neophyte is perhaps the most difficult and intimidating maneuver that they will have to face on the way to becoming a pilot. For many there is the misconception that the landing is this one magical moment when airplane and occupants cease being airborne and become ground bound. But the fact of the matter is that the landing is actually a five phase event. These phases are: **1. The Glide; 2. The Flare; 3. Dissipating the Energy; 4. The Touchdown; 5. The Rollout.**

Let's look at each phase.

**THE GLIDE:** The important thing about the glide is that if it is done correctly, everything else should fall in to place. But if the glide is not right, then the likelihood of a good landing is greatly reduced. What makes the glide “correct” is for it to be “on target” and “on speed”.

By “on target” I mean that you have picked some kind of aim point, or “target” on the runway. It might be the touchdown zone marker, it might be the second center line, or it might even be the dying groundhog you hit on your takeoff. Having picked this aim point you must keep it in the same place in your windshield. If it is moving up the window, you will be landing short of your target, and if it is moving down, you will land beyond it. Most pilots control the movement of the “target” with power. If your target is moving down, reduce your power, and add power if the target is moving up the windshield.

By “on speed” I mean that you maintain the correct airspeed for the approach (65 – 60). Most pilots control the speed with pitch. If you are fast, pitch up a little, if slow pitch down. Obviously if you are chasing your altitudes with big changes in power you will also be making big changes in pitch. The ideal approach is a stable approach where there is no need for any change in pitch and/or power unless the atmosphere creates that need. Also keep in mind that all changes that are made should be small ones.

(NOTE: If you are so high on final that you have already bent the throttle trying to reduce more power, you should consider the section on **THE GO AROUND**)



**THE FLARE:** The Flare is when we break the glide. (Not to be confused with breaking the airplane.) Learning when to break the glide is very difficult to explain with words, and is a thing best learned by experience. It can be extremely frustrating, but typically all of a sudden the picture will “snap” into place and you will have it. As you endeavor to learn the flare, and before you “snap”, here are a few pointers.

Where you look, is key. During the glide we have focused on our aim point, but as we get close to the runway (10' – 15') we have to transition our focus further and further down the runway. The timing of this is somewhat crucial to a good flare. If we start looking way down the runway too soon, we typically will flare too high. On the other hand if we forget to transition our gaze, and stare intently on the “target” we will flare too late.

As a reference as to how far down the runway to transition your gaze, consider how far in front of your car you are looking when you are driving down the road at 60 MPH. That's about where you'll need to be looking as we get to phase 3.

**DISSIPATING THE ENERGY:** If we have timed our flare correctly we will now find ourselves anywhere from 2” – 7” above the runway. But the airplane is not yet ready to quit flying, because it still has a little too much speed. So we now have to dissipate the energy. We do this by slowly pulling back on the stick to keep the nose wheel slightly higher than the main wheels, as we decelerate. The idea is to touch down on the main wheels first. Patience is required as this is done. DO NOT be in a hurry to force the airplane onto the runway.

If we have allowed our speed to get too fast on final approach, it will take much longer to dissipate the energy, leading to potential ballooning, and then running out of energy too high above the runway. If we have allowed our airspeed to get too slow, we won't be able to arrest our sink (flare) and will have a hard landing.

**THE TOUCHDOWN:** The touchdown, in an ideal situation, occurs just once, and is a smooth contact of the main wheels with the runway. But the landing is not over yet, and it is imperative that the pilot still maintain back pressure on the stick. Failure to do so could lead to one finding oneself back in the air. Remember this phase is not over until slowed to taxi speed, so the stick must be held all the way back until exiting the runway.

**THE ROLLOUT:** The last phase of the landing is the rollout. Make sure that you keep your nosewheel on the runway center line until reaching the taxiway, and then insure that you stay on the yellow taxi center line. Doing so will minimize any possibility of striking any objects with your wingtips.



## GO AROUND

The Go Around is perhaps the most important, and often the most neglected, maneuver we have in flying. At any time in the landing sequence, **if the landing is in doubt** the go around should be initiated.

Absolutely first! Apply full takeoff power!!!

Then raise flaps to 20°

You might very well be trimmed full nose up at this point, so hold forward pressure on the stick to maintain 65 KIAS while you trim for that pitch attitude that yields 65KIAS

Be sure to add sufficient right rudder to correct for the left turning tendencies that the full power, steep pitch, and slow flight will produce!

1. Apply full power
2. Raise flaps to full up
3. Right rudder for left turning tendencies
4. Trim for 65 KIAS

## CONSTANT ALTITUDE TURNS

1. Set power and trim for normal cruise
2. Roll into turn with coordinated aileron and rudder inputs
3. As bank angle increases added backpressure on stick will be needed to maintain altitude (watch the relationship of the cowling and the horizon to determine this)
4. Add power to maintain airspeed
5. Do not exceed 60° of bank
6. If back pressure on stick is too much, reduce bank to maintain altitude
7. Time rollout so that wings are level at desired heading
8. Rollout with coordinated aileron and rudder inputs
9. Reduce back pressure on stick, and reduce power to prevent ballooning above desired altitude

## SHORT FIELD TAKEOFF

1. Taxi to runway centerline, allowing for maximum runway length
2. H.A.T. check
3. Check wind indicators
4. Hold brakes as you apply full takeoff power
5. Release brakes, maintain runway centerline, aileron deflection as necessary
6. Rotate at 40 KIAS
7. Accelerate in ground effect to 65 KIAS
8. Climb out at 65 KIAS
9. Climb to 200' AGL before raising flaps Climb out as in normal takeoff





## **SOFT FIELD TAKEOFF**

1. Before takeoff checks completed as you taxi, without stopping
2. H.A.T. check and wind checks complete
3. Maintain full back pressure on stick as you taxi
4. **DO NOT STOP!**
5. As you get to runway centerline add full takeoff power without coming to a stop
6. Maintain full back stick pressure until nose wheel gets light and lifts off of runway
7. Ease off back pressure on stick to keep the nosewheel just off the runway
8. Maintain this attitude until main wheels liftoff (aileron deflection as necessary for crosswind)
9. As airplane lifts off, lower nose and accelerate in ground effect to 65 KIAS
10. Continue as in SHORT FIELD takeoff

## **SIMULATED POWER FAILURE**

If things get real quiet up front, the engine is not getting one of three things: FUEL, FIRE, or AIR. Therefore it is important to determine which of these things it is not getting, and restore it, if at all possible. At the same time, keep in mind that altitude is one of your best friends right now. Therefore do not throw away altitude by allowing the airplane to dive and build up airspeed. Conversely do not allow the airplane to stall. That will really take your mind away from things it needs to be thinking about, such as:

**FUEL:** Check to insure that the fuel pump is **ON**  
Switch fuel tanks

**FIRE:** Check Master Switch **ON**  
Check "Magneto" switches **ON**

**AIR:** Carburetor Heat **ON**  
Check Choke **OFF**

### **THEN:**

1. Establish best glide speed of 65 KIAS
2. Choose a landing spot, and circle this spot, keeping it in view until approximately 1'000' AGL, at which point you should be at the "key" point



3. If you have time set “7700” code in transponder
4. Announce: “MAYDAY, MAYDAY, MAYDAY” (and your position, if known) on either current frequency (if talking to ATC) or 121.5
5. Lower flaps only when landing on chosen spot is assured
6. Resist urge to “stretch” the glide with back stick pressure
7. If landing off airport, turn off master switch and fuel selector prior to touching down

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