

Standard Operating Procedures Ver. 1.1

The main reason for standardized operating procedures in the cockpit is simple: SAFETY. Standardized procedures require discipline and strict adherence to flows, callouts, and checklist use. Initially, substantial time will be required to the study and memorization of these procedures, but in the end the pilot will achieve a higher level of performance, efficiency, and safety that will serve as a solid foundation for his entire flying career.

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Preflight Duties

Preflight duties will be conducted in the following order:

1. Check Aircraft Maintenance and Inspection Status:
 - **Review past discrepancies, deferred items, and assure that no open discrepancies exist.** Check open squawks and review squawk history for the airplane.
 - Log in to CASSI, click on N-number and **verify that all aircraft and equipment inspections are current** including the 100-hour inspection, transponder certification, altimeter certification, altitude encoder, ELT battery, and airworthiness directives.
 - **If flying IFR**, verify that the VOR receiver check is current and the GPS database is current.

2. Calculate Weight and Balance and Aircraft Performance:
 - Complete a **weight and balance** calculations, check full and empty fuel CG, check limitations in POH.
 - Calculate **takeoff roll and takeoff distance** over 50ft obstacle using current temperature and field elevation
 - Calculate **landing roll and landing distance** over 50 ft obstacle for destination airport. If on a local flight calculate for local airport.
 - Note **runway lengths** of intended use and compare with performance number using a 50% buffer.
 - Note fuel quantity: **calculate minimum fuel required for flight with 1hr reserve.** Assure airplane is fueled appropriately.

3. Obtain a Standard Weather Briefing through DUATS or FSS (1-800-WX-BRIEF)
 - Check for **TFRs**
 - If staying in the area, obtain an Area briefing (30nm radius) within 1 hr. of departure.
 - When on a cross-country flight, obtain a Low Altitude Briefing
 - Check aviationweather.gov for satellite images and additional weather charts

4. Go to the aircraft and complete a preflight inspection and walkaround in the following order
 - Complete interior checks (call for fuel right away if needed)
 - Complete fuel and oil inspections
 - Complete walk-around inspection
 - Review Checklist

Required Documents and Equipment

Every pilot must carry in their flight bag the following minimum required documents:

- Current VFR navigation charts (Terminal/Sectional)
- Current IFR en route and approach charts (if on an IFR Flight Plan)
- Current A/FD
- Kneeboard
- Headset
- Sunglasses
- Aircraft Checklist
- Pencil/Pens x 2
- Flashlight (min 1 if flying at night)
- Extra batteries as required for headset or flashlight, etc.
- For extended flights over mountainous or uninhabited terrain, survival gear, first aid kit, food, and water.

Licensed Pilot:

- Pilot License
- State Issued ID
- Current Medical

Student Pilots on Solo Flights:

- Student Pilot Certificate with required endorsements for Solo flight
- Logbook with required endorsements for Solo flight
- State Issued ID
- Current Medical

Pilot Briefings

The following pilot briefings will be required prior to engine start as part of the Passenger Brief in the "Interior Checklist"

Pilot Briefings

- 1) Passenger Brief**
- 2) Weather Brief**
- 3) Departure/Clearance Brief**
- 4) Performance Brief**
- 5) Takeoff Emergency Brief**
- 6) Taxi Brief**

Passenger Brief

- Use of Seatbelts
- Operation of Doors and Windows
- Air Vents
- Fire Extinguisher
- Sterile Cockpit
- Look out for Traffic, Speak Up
- PIC designation/ Training Flight
- Transfer of Controls
- Emergencies

Weather Brief

- Runway wind condition
- Visibility
- Ceiling/Clouds
- Airmets/ Sigmets
- TFRs

Departure/Clearance Brief

- Runway in use
- No turns below 500AGL
- Review noise abatement departure procedure (VFR)
- Review initial climb altitude (VFR)
- Review IFR Clearance (IFR)

Performance Review

- Vr
- Vx
- Vy
- Takeoff Weight
- Takeoff Flap Configuration

- Takeoff Ground Roll Distance
- Takeoff Distance over 50ft obstacle
- Runway Length Available

Takeoff Emergency Brief

If *Engine Fire* or *Engine Failure* occurs before rotation speed (55kts) we will:

- Abort the takeoff
- Throttles immediately to idle
- Brake
- Mixture cutoff
- Mags off
- Master off.

If *Engine Fire* or *Engine Failure* occurs after rotation speed (55kts) we will:

- pitch forward for best glide (70kts or as per POH)
- land straight ahead or within 30° off Rwy Hdg to avoid obstacles
- secure the airplane
 - Fuel shutoff off
 - Mixture cutoff
 - Mags off
 - Lower flaps
 - Master off
 - Unlatch doors
 - Protect body

No turns beyond 30° off Rwy Hdg below 500ft AGL

Taxi Brief

- Refer to Taxi Diagram
- Review Expected/ Cleared Taxi Route

Exchange of Flight Controls

It is critical to clearly identify who is flying the airplane. To avoid confusion the following procedure must be used when exchanging the flight controls.

The pilot giving the controls will state:

"You have the flight controls"

The second pilot will take the controls and state:

"I have the flight controls"

The first pilot will verify and state:

"You have the flight controls"

If at any point it becomes necessary for the instructor to take the controls, he will state:

"I have the flight controls"

The student pilot will verify:

"You have the flight controls"

The instructor will state:

"I have the flight controls"

Collision Avoidance

While in VFR conditions (including while on an IFR Flight Plan), the pilot is required to remain vigilant for potential traffic conflicts along the route. During training this is especially critical when operating in the practice area, when not receiving radar flight following from ATC, during traffic pattern operations at tower controlled airports, and especially when operating in uncontrolled fields. The vast majority of mid-air collisions occur:

- During daylight hours
- Below 3,000 feet AGL
- Within 10 miles of an airport
- On weekend days

To ensure a higher margin of safety the following collision avoidance procedure must be adhered to:

- 1) Before taxiing from the tie down spot, any time the pilot approaches a taxiway intersection, or any time the pilot makes a turn into a new taxiway, the pilot will visually clear the area (of other aircraft, vehicles, or people) in both directions, and callout as they are doing so.
 - Example: *"Clear Left, Clear Right"*
- 2) After receiving takeoff clearance from the tower at a controlled airport, or when taking off from an uncontrolled airport, the pilot must visually check the base and final are free of conflicting air traffic and verbally announce "Approach Clear".
 - Example: *"Approach Clear"*. At uncontrolled airports it is also prudent to turn the airplane 360° to inspect the area before taking the runway. See also, uncontrolled field radio communication procedures.
- 3) When assigned a new heading or altitude the pilot will announce direction of turn and heading as assigned and/or new altitude.
 - Example: *"Left Turn Heading 260", "Climb and Maintain 3,500"*.
- 4) Before making any turns, whether in the traffic pattern or at altitude, the pilot will verbally announce as he checks for traffic in all directions. In a high wing aircraft (e.g. Cessna 152, Cessna 172), the pilot will need to gently raise the wing to clear the area. For example, if a LEFT turn has been assigned, the pilot will clear the area using the following phraseology:
 - Example: *"Clear Right, Clear Center, Clear Left"*

- 5) While climbing to a new en-route altitude, and especially when climbing at V_y or slower, the pilot will lower the nose of the airplane to look for traffic ahead. Optimally, after reaching 1000 ft, the pilot will select a cruise climb speed that will ensure adequate visibility forward and sufficient cooling to the engine.
- 6) Before practicing any maneuver at altitude, the pilot will make clearing turns to ensure the area remains clear of traffic. This is best accomplished by making a LEFT 90° turn followed by a RIGHT 90° turn. The pilot will announce that he is clearing the area, and announce when the area is clear.
 - Example: Before starting a maneuver announce: "*Clearing the area*". After completing your clearing turns announce: "*Area is clear*".
- 7) Anytime traffic is spotted, point out the traffic, state the "clock" direction of the traffic, estimated distance, and whether the traffic is below the horizon and thus below your altitude by stating "*low*", above the horizon or above your altitude by stating "*high*", or on the horizon and at your altitude by stating "*same altitude*". If the traffic does not appear to pose a collision conflict, announce "*no factor*". If the traffic appears stationary on the windshield at your altitude (eye level with you on the horizon), announce you are taking immediate evasive action as outlined in CFR FAR Part 91.
 - Example: "*Traffic, 10 o'clock, 3 miles, low, no factor*"
 - Example: "*Traffic, 12 o'clock, 1 mile, same altitude, Turning right to avoid*"

Radio Procedures

- 1) Always write down the latest ATIS information. You are required to have this information in the cockpit before departure.
- 2) If you are ever unclear about an instruction or if the last radio instruction was not heard properly, always VERIFY with the controller, or ask the controller to repeat the instruction by using the phrase "Say Again".
 - Example 1: *"San Carlos Tower, Cessna 35583, verify cleared to land runway 30"*
 - Example 2: *"San Carlos Tower, Cessna 35583, Say again"*
- 3) When you receive a radio instruction that you are not ready to execute or which in your best judgment would compromise safety, let the tower know that you are unable to comply by using the word "Unable". Don't let the tower fly your airplane and do not allow yourself to get rushed by ATC.
 - Example: Tower *"Cessna 35583, cleared for immediate takeoff, traffic 1 mile final."* You: *"Tower, Cessna 35583, unable."*
- 4) You may abbreviate your callsign ("Cessna 583 instead of Cessna 35583") only after the tower has abbreviated your call-sign first.
- 5) When you receive a traffic advisory, acknowledge by stating "*Traffic in Sight*" if the traffic is in sight, or "*Looking*" if traffic is not in sight.
 - Example: Tower *"Cessna 583, you are following a Pilatus on a 3 mile final, cleared to land runway 30 number two, report traffic in sight"* You: *"Cleared to land runway 30, number 2, traffic in sight, Cessna 583"*
or
"Cleared to land, runway 30, looking for traffic, Cessna 583."
- 6) After you receive taxi instructions, always read back the clearance and state the taxiway and runway assignment. When receiving a takeoff or landing clearance, always read back the clearance and state the runway assignment.
 - Example 1: Tower *"Cessna 583, San Carlos Ground, Taxi to runway 30 via Juliet."* You *"Taxi to runway 30 via Juliet, Cessna 583"*
 - Example 2: Tower *"Cessna 583, San Carlos Tower, Cleared for takeoff runway 30, Bay Meadows departure."* You: *"Cleared for takeoff, runway 30, Cessna 583."*

Cockpit Flows and Checklist Use

Normal Operations: The pilot will learn how to “flow the switches” for each stage of flight from memory. The pilot will then verify that ALL items in the checklist were completed correctly by reviewing the appropriate aircraft checklist. The pilot will announce the checklist, complete the flow, review the checklist, and announce when the checklist has been completed.

Example:

- 1) Climbing through 1,500 ft AGL, the pilot will announce: "*Climb checklist*"
- 2) The pilot will complete the climb checklist flow
- 3) The pilot will pick up the checklist and READ each item on the checklist
- 4) The pilot will announce when finished: "*Climb checklist complete*"

With the exception of Engine Out Emergency Procedures (where a troubleshooting flow is accepted, most abnormal procedures and emergency checklists are to be completed using the do/verify philosophy. To minimize the chances of pilot error during these procedures, they are not to be performed as part of a flow pattern. Instead, **abnormal procedures are to be conducted using a read/do methodology with the appropriate checklists.**

Standard Callouts

Normal Callouts

Action	Callout
<i>Initial Checklist</i>	"Initial Checklist Complete"
<i>Exterior Checklist</i>	"Exterior Checklist Complete"
<i>Interior Checklist</i>	"Interior Checklist"
<i>Interior Checklist Complete</i>	"Interior Checklist Complete"
<i>Start Checklist</i>	"Start Checklist"
<i>Start Checklist Complete</i>	"Start Checklist Complete"
<i>Pre Taxi Checklist</i>	"Pre Taxi Checklist"
<i>Pre Taxi Checklist Complete</i>	"Pre Taxi Checklist Complete"
<i>Run Up Checklist</i>	"Run Up Checklist"
<i>Run Up Checklist Complete</i>	"Run Up Checklist Complete"
<i>Pre-Takeoff Checklist</i>	"Pre-Takeoff Checklist"
<i>Pre-Takeoff Checklist Complete</i>	"Pre-Takeoff Checklist Complete"
<i>(Climbing through 1500' AGL) Climb Checklist</i>	"Climb Checklist"
<i>Climb Checklist Complete</i>	"Climb Checklist Complete"
<i>(After leveling off at your cruise altitude) Cruise Checklist</i>	"Cruise Checklist"
<i>Cruise Checklist Complete</i>	"Cruise Checklist Complete"
<i>(When starting the descent for the airport ~ 10 - 20 miles out) Descent Checklist</i>	"Descent Checklist"
<i>Descent Checklist Complete</i>	"Descent Checklist Complete"
<i>(When runway is in sight, or when established on downwind) Pre-Landing Checklist</i>	"Pre-Landing Checklist"
<i>Pre-Landing Checklist Complete</i>	"Pre-Landing Checklist Complete"
<i>(Turning Final) GUMPS Check</i>	"GUMPS Check"
<i>After Landing Checklist</i>	"After Landing Checklist"
<i>After Landing Checklist Complete</i>	"After Landing Checklist Complete"
<i>Secure Checklist</i>	"Secure Checklist"
<i>Secure Checklist Complete</i>	"Secure Checklist Complete"

During All Operations

Action	Callout
<i>Prior to engaging starter</i>	Shout "Clear Prop"
<i>Before Extending Wing Flaps (Flight)</i>	"Vfe Check"
<i>Before making a turn</i>	"Clear Left, Clear Center, Clear Right" (in direction of turn)
<i>1000 ft. Above/Below Assigned Altitude</i>	"1000 to go"
<i>500 ft. Above/Below Assigned Altitude</i>	"500 to go"
<i>100 ft. Above/Below Assigned Altitude</i>	"Approaching Altitude"

Normal Takeoff

Action	Callout
<i>After advancing power: Tachometer Indications - Engine Instruments in Green Arcs - Airspeed Indications -</i>	"Power Checks" "Engine Instruments In The Green" "Airspeed Alive"
<i>Aborted Takeoff</i>	"Abort, Abort, Abort"
<i>At Rotation Speed</i>	"Rotate"
<i>Positive Rate-of-Climb</i>	"Positive Rate"
<i>At Vy Speed</i>	"Vy"
<i>300ft AGL Visually check flaps are retracted, Check Rwy Heading and Centerline</i>	"300ft, Check Flaps Up, Rwy Hdg, Check Centerline"
<i>Passing through 1500 ft AGL</i>	"Climb Checklist"
<i>1000 ft. Above/Below Assigned Altitude</i>	"1000 to go"
<i>500 ft. Above/Below Assigned Altitude</i>	"500 to go"
<i>100 ft. Above/Below Assigned Altitude</i>	"Approaching Altitude"

During IFR Operations

Actions	Callouts
Precision Approach	
<i>Localizer Alive</i>	"Localizer Alive"
<i>Glide slope Alive</i>	"Glide slope Alive"
<i>1 dot below glide slope</i>	"Before Landing Checklist"
<i>Final Approach Fix DME Fix or Waypoint at Glide slope Intercept</i>	"Final Approach Fix, 1600ft." (GS crossing alt.), no flags"
<i>500 ft. Above DA</i>	"500 to Minimums, Stabilized"
<i>400 ft Above DA</i>	"400"
<i>300 ft Above DA</i>	"300"
<i>200 ft Above DA</i>	"200"
<i>100 ft. Above DA</i>	"Approaching Minimums"
<i>Arrival at DA, Runway not in sight, Approach Lights not in sight</i>	"Minimums, Missed Approach"
<i>Arrival at DA, Runway in sight:</i>	"Minimums, Runway in sight, Landing"
<i>Arrival at DA, Approach Lights In Sight</i>	"Minimums, Approach Lights, Continue"
<i>100 ft Above TDZE</i>	"Runway in Sight, Landing" Or "Missed Approach"
Non-Precision	
<i>CDI Alive</i>	"Course Alive"
<i>ADF Approach: Needle within 10°</i>	"ADF Needle within 10°"
<i>GPS Approach: Mode Active</i>	"Approach Active, Pre Landing Checklist"
<i>VOR/NDB Approach: 2 nm prior to FAF or Proc turn Inbound</i>	"Pre Landing Checklist"
<i>Final Approach Fix</i>	"Final Approach Fix, 2000 (alt), no Flags"
<i>500 ft. Above MDA</i>	"500 to Minimums"
<i>100 ft. Above MDA</i>	"Approaching Minimums"
<i>At MDA</i>	"Minimums, Distance or Time to MAP"
<i>Runway in Sight Prior to VDP</i>	"Runway in Sight, Maintain Altitude"
<i>AT VDP: (NORMAL STABILIZED DESCENT AND LANDING MAY NOT BE POSSIBLE BEYOND "VDP", AT WHICH POINT MISSED APPROACH</i>	"VDP, Runway in sight, Landing" Or "VDP, Approach Lights, Continue" Or "VDP, Bad Position, Maintain Altitude"

<i>WOULD BE MANDATORY.)</i>	
<i>Arrival at Missed Approach Point with or without Runway in Sight</i>	"Missed Approach Point, Going Missed Approach"
Non-Precision - Circling FAF Inbound	
<i>Within Circling Radius at/above MDA</i>	"Within ____ nm, Circling"
<i>Flight Below MDA with Runway in sight</i>	"Normal Position, Leaving MDA"
<i>Loss of Visual Contact with Runway</i>	"Visual Lost, Going Missed"

Note: If a VDP is **published**, descending below MDA beyond the VDP is discouraged. In such a case, establish an immediate climb, continue to the MAP, and execute the published MAP.

Visual Approaches under IFR	
<i>500 ft. Above Field Elevation</i>	"500 to Go, stabilized"

Emergency Callouts

Action	Callout
<i>Power Loss in Flight Checklist</i>	"Power Loss in Flight Checklist"
<i>Power Loss in Flight Checklist Complete</i>	"Power Loss in Flight Checklist Complete"
<i>Engine Secure – In Flight Checklist</i>	"Engine Secure – In Flight Checklist"
<i>Engine Secure – In Flight Checklist Complete</i>	"Engine Secure – In Flight Checklist Complete"
<i>Electrical Fire – In Flight Checklist</i>	"Electrical Fire – In Flight Checklist"
<i>Electrical Fire – In Flight Checklist Complete</i>	"Electrical Fire – In Flight Checklist Complete"
<i>Engine Fire – In Flight Checklist</i>	"Engine Fire – In Flight Checklist"
<i>Engine Fire – In Flight Checklist Complete</i>	"Engine Fire – In Flight Checklist Complete"
<i>Engine Fire – During Start Checklist</i>	"Engine Fire – During Start Checklist"
<i>Engine Fire – During Start Checklist Complete</i>	"Engine Fire – During Start Checklist Complete"

Abnormal Callouts

Action	Callout
<i>Electrical Failure Checklist</i>	"Electrical Failure Checklist"
<i>Electrical Failure Checklist Complete</i>	"Electrical Failure Checklist Complete"

<i>Radio Failure Checklist</i>	"Radio Failure Checklist"
<i>Radio Failure Checklist Complete</i>	"Radio Failure Checklist Complete"

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