Standard Operating Procedures

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General Information

SimuFlite strongly supports the premise that the disciplined use of well-developed Standard Operating Procedures (SOP) is central to safe, professional aircraft operations, especially in multi-crew, complex, or high performance aircraft.

If your flight department has an SOP, we encourage you to use it during your training. If your flight department does not already have one, we welcome your use of the SimuFlite SOP.

Corporate pilots carefully developed this SOP. A product of their experience, it is the way SimuFlite conducts its flight operations.

The procedures described herein are specific to the Citation V and apply to specified phases of flight. The flight crew member designated for each step accomplishes it as indicated.

Definitions

LH/RH – Pilot Station. Designation of seat position for accomplishing a given task because of proximity to the respective control/indicator. Regardless of PF or PNF role, the pilot in that seat performs tasks and responds to checklist challenges accordingly.

PF – Pilot Flying. The pilot responsible for controlling the flight of the aircraft.

PIC – Pilot-in-Command. The pilot responsible for the operation and safety of an aircraft during flight time.

PNF – Pilot Not Flying. The pilot who is not controlling the flight of the aircraft.

Flow Patterns

Flow patterns are an integral part of the SOP. Accomplish the cockpit setup for each phase of flight with a flow pattern, then refer to the checklist to verify the setup. Use normal checklists as "done lists" instead of "do lists."

Flow patterns are disciplined procedures; they require pilots who understand the aircraft systems/controls and who methodically accomplish the flow pattern.

A standardized flow pattern for the cockpit setup before starting engines appears in the Preflight section.

Checklists

Use a challenge-response method to execute any checklist. After the PF initiates the checklist, the PNF challenges by reading the checklist item aloud. The PF is responsible for verifying that the items designated as PF or his seat position (i.e., LH or RH) are accomplished and for responding orally to the challenge. Items designated on the checklist as PNF or by his seat position are the PNF's responsibility. The PNF confirms the accomplishment of the item, then responds orally to his own challenge. In all cases, the response by either pilot is confirmed by the other and any disagreement is resolved prior to continuing the checklist.

After completion of any checklist, the PNF states "_____ checklist is complete." This allows the PF to maintain situational awareness during checklist phases and prompts the PF to continue to the next checklist, if required.

Effective checklists are pertinent and concise. Use them the way they are written: verbatim, smartly, and professionally.

Omission of Checklists

While the PF is responsible for initiating checklists, the PNF should ask the PF whether a checklist should be started if, in his opinion, a checklist is overlooked. As an expression of good crew resource management, such prompting is appropriate for any flight situation: training, operations, or checkrides.

Challenge/No Response

If the PNF observes and challenges a flight deviation or critical situation, the PF should respond immediately. If the PF does not respond by oral communication or action, the PNF must issue a second challenge that is loud and clear. If the PF does not respond after the second challenge, the PNF must ensure the safety of the aircraft. The PNF must announce that he is assuming control and then take the necessary actions to return the aircraft to a safe operating envelope.

Abnormal/Emergency Procedures

When any crewmember recognizes an abnormal or emergency condition, the PIC designates who controls the aircraft, who performs the tasks, and any items to be monitored. Following these designations, the PIC calls for the appropriate checklist. The crewmember designated on the checklist accomplishes the checklist items with the appropriate challenge/response.

NOTE: "Control" means responsible for flight control of the aircraft, whether manual or automatic.

The pilot designated to fly the aircraft (i.e., PF) does not perform tasks that compromise this primary responsibility, regardless of whether he uses the autopilot or flies manually.

Both pilots must be able to respond to an emergency situation that requires immediate corrective action without reference to a checklist. The elements of an emergency procedure that must be performed without reference to the appropriate checklist are called memory or recall items. Accomplish all other abnormal and emergency procedures while referring to the printed checklist.

Accomplishing abnormal and emergency checklists differs from accomplishing normal procedure checklists in that the pilot reading the checklist states both the challenge and the response when challenging each item.

When a checklist procedure calls for the movement or manipulation of controls or switches critical to safety of flight (e.g., throttles, engine fire switches, fire bottle discharge switches), the pilot performing the action obtains verification from the other pilot that he is moving the correct control or switch prior to initiating the action.

Any checklist action pertaining to a specific control, switch, or equipment that is duplicated in the cockpit is read to include its relative position and the action required (e.g., "Left Throttle – OFF; Left Boost Pump – NORMAL").

Time Critical Situations

When the aircraft, passengers, and/or crew are in jeopardy, remember three things.

- FLY THE AIRCRAFT – Maintain aircraft control.
- RECOGNIZE CHALLENGE – Analyze the situation.
- RESPOND – Take appropriate action.

Rejected Takeoffs

The rejected takeoff (abort) procedure is a preplanned maneuver; both crewmembers must be aware of and briefed on the types of malfunctions that mandate an abort. Assuming the crew trains to a firmly established SOP, either crewmember may call for an abort.

The PF normally commands and executes the takeoff abort for directional control problems or catastrophic malfunctions. Additionally, any indication of the following malfunctions prior to V_1 is cause for an abort:

- engine failure
- engine fire
- thrust reverser deployment
- loss of directional control.

In addition to the above, the PF usually executes an abort prior to 70 KIAS for any abnormality observed.

When the PNF calls an abort, the PF announces "Abort." or "Continue." and executes the appropriate procedure.

Critical Malfunctions in Flight

In flight, the observing crewmember positively announces a malfunction. As time permits, the other crewmember makes every effort to confirm/identify the malfunction before initiating any emergency action.

If the PNF is the first to observe any indication of a critical failure, he announces it and simultaneously identifies the malfunction to the PF by pointing to the indicator/annunciator.

After verifying the malfunction, the PF announces his decision and commands accomplishment of any checklist memory items. The PF monitors the PNF during the accomplishment of those tasks assigned to him.

Non-Critical Malfunctions in Flight

Procedures for recognizing and verifying a non-critical malfunction or impending malfunction are the same as those used for time critical situations: use positive oral and graphic communication to identify and direct the proper response. Time, however, is not as critical and allows a more deliberate response to the malfunction. Always use the appropriate checklist to accomplish the corrective action.

Radio Tuning and Communication

The PNF accomplishes navigation and communication radio tuning, identification, and ground communication. For navigation radios, the PNF tunes and identifies all navigation aids. Before tuning the PF's radios, he announces the NAVAID to be set. In tuning the primary NAVAID, the PNF coordinates with the PF to ensure proper selection sequencing with the autopilot mode. After tuning and identifying the PF's NAVAID, the PNF announces "(Facility) tuned and identified."

Monitor NDB audio output anytime the NDB is in use as the NAVAID. Use the marker beacon audio as backup to visual annunciation for marker passage confirmation.

In tuning the VHF radios for ATC communication, the PNF places the newly assigned frequency in the head not in use (i.e., preselected) at the time of receipt. After contact on the new frequency, the PNF retains the previously assigned frequency for a reasonable time period.

Pre-Departure Briefings

The PIC should conduct a pre-departure briefing prior to each flight to address potential problems, weather delays, safety considerations, and operational issues. Pre-departure briefings should include all crewmembers to enhance team-building and set the tone for the flight. The briefing may be formal or informal, but should include some standard items. The acronym AWARE works well to ensure no points are missed. This is also an opportunity to brief any takeoff or departure deviations from the SOP due to weather or runway conditions.

NOTE: The acronym AWARE stands for the following.

- Aircraft status
- Weather
- Airport information
- Route of flight
- Extra

Altitude Assignment

The PNF sets the assigned altitude in the altitude alerter and points to the alerter while orally repeating the altitude. The PNF continues to point to the altitude alerter until the PF confirms the altitude assignment and alerter setting.

Advising of Aircraft Configuration Change

If the PF is about to make an aircraft control or configuration change, he alerts the PNF to the forthcoming change (e.g., gear, speedbrake, and flap selections). If time permits, he also announces any abrupt flight path changes so there is always mutual understanding of the intended flight path.

Time permitting, a PA announcement to the passengers precedes maneuvers involving unusual deck or roll angles.

Transitioning from Instrument to Visual Conditions

If visual meteorological conditions (VMC) are encountered during an instrument approach, the PNF normally continues to make callouts for the instrument approach being conducted. However, the PF may request a changeover to visual traffic pattern callouts.

Phase of Flight SOP

Holding Short

PF	PNF
CALL "Before Takeoff checklist."	
	ACTION Complete Before Takeoff checklist.
	CALL "Before Takeoff checklist complete."

Takeoff Briefing

ACTION Brief the following:

- initial heading/ course
- initial altitude
- airspeed limit (if applicable)
- clearance limit
- emergency return plan
- SOP deviations.

Consider the following:

- impaired runway conditions
- weather
- obstacle clearance
- SIDS.

Cleared for Takeoff

CALL "Takeoff checklist."	
	ACTION Complete Takeoff checklist.
	CALL "Takeoff checklist complete."

Takeoff Roll

PF	PNF
Setting Takeoff Power	
CALL "Set _____ ."	**CALL** " _____ set."
Initial Airspeed Indication	
	CALL "Airspeed alive."
	At 70 KIAS,
	CALL "70 kts crosscheck."
At V_1	
	CALL "V_1."
ACTION Move hand from throttles to yoke.	
At V_R	
	CALL "Rotate."
ACTION Rotate to approximately 12° to 15° pitch attitude for takeoff.	

Climb

PF	PNF
At Positive Rate of Climb	
	CALL "Positive rate."
Only after PNF's call, **CALL** "Gear up."	
	CALL "Gear selected up." When gear indicates up, "Gear indicates up."
After Gear Retraction	
	ACTION Immediately accomplish attitude correlation check. ▪ PF's and PNF's ADI displays agree. ▪ Pitch and bank angles are acceptable.
	CALL "Attitudes check." Or, if a fault exists, give a concise statement of the discrepancy.
At V_2 + 10 KIAS and 400 Ft Above Airport Surface (Minimum)	
	CALL "V_2 + 10 KIAS."
CALL "Flaps up."	
	CALL "Flaps selected UP." When indicator indicates UP, "Flaps indicate UP."

Climb (continued)

PF	PNF
At V_{ENR} (Minimum)	
CALL "Climb power."	
	CALL "Climb power set."
At 1,500 Ft (Minimum) Above Airport Surface and Workload Permitting	
CALL "Climb checklist."	
	ACTION Complete Climb checklist.
	CALL "Climb checklist complete.
At Transition Altitude	
CALL "29.92 set." Transition Altitude checklist."	**CALL** "29.92 set."
	ACTION Complete Transition Altitude checklist.
	CALL "Transition Altitude checklist complete."
At 1,000 Ft Below Assigned Altitude	
	CALL "____ (altitude) for ____ (altitude)." (e.g., "9,000 for 10,000.")
CALL "____ (altitude) for ____ (altitude)." (e.g., "9,000 for 10,000.")	

Cruise

PF	PNF
CALL "Cruise checklist."	
	ACTION Complete Cruise checklist.
	CALL "Cruise checklist complete."
Altitude Deviation in Excess of 100 Ft	
	CALL "Altitude."
CALL "Correcting."	
Course Deviation in Excess of One Half Dot	
	CALL "Course."
CALL "Correcting."	

Descent

PF	PNF
CALL "Descent checklist."	
	ACTION Complete Descent checklist.
	CALL "Descent checklist complete."
At 1,000 Ft Above Assigned Altitude	
	CALL "____ (altitude) for ____ (altitude)." (e.g., "10,000 for 9,000.")
CALL "____ (altitude) for ____ (altitude)." (e.g., "10,000 for 9,000.")	
At Transition Level	
CALL "Altimeter set ____ Transition Level checklist."	**CALL** "Altimeter set ____ ."
	ACTION Complete Transition Level checklist.
	CALL "Transition Level checklist complete."
At 10,000 Ft	
	CALL "10,000 ft."
CALL "Check. Speed 250 kts."	

Maintain sterile cockpit below 10,000 ft above airport surface.

Descent (continued)

PF	PNF

At Appropriate Workload Time

REVIEW **REVIEW**

Review the following:
- approach to be executed
- field elevation
- appropriate minimum sector altitude(s)
- inbound leg to FAF, procedure turn direction and altitude
- final approach course heading and intercept altitude
- timing required
- DA/MDA
- MAP (non-precision)
- VDP
- special procedures (DME step-down, arc, etc.)
- type of approach lights in use (and radio keying procedures, if required)
- missed approach procedures
- runway information and conditions.

ACTION Brief the following:
- configuration
- approach speed
- minimum safe altitude
- approach course
- FAF altitude
- DA/MDA altitude
- field elevation
- VDP
- missed approach
  - heading
  - altitude
  - intentions
- abnormal implications.

Accomplish as many checklist items as possible. The Approach checklist must be completed prior to the initial approach fix.

Precision Approach

PF	PNF
Prior to Initial Approach Fix	
CALL "Approach checklist."	
	ACTION Complete Approach checklist.
	CALL "Approach checklist complete."
After Level-Off on Intermediate Approach Segment	
CALL "Flaps APPROACH."	
	CALL "Flaps selected APPROACH."
	When flaps indicate APPROACH "Flaps indicate APPROACH."
At Initial Convergence of Course Deviation Bar	
CALL "Localizer/course alive."	**CALL** "Localizer/course alive."
At Initial Downward Movement of Glideslope Raw Data Indicator	
CALL "Glideslope alive."	**CALL** "Glideslope alive."
When Annunciators Indicate Localizer Capture	
CALL "Localizer captured."	**CALL** "Localizer captured."

Precision Approach (continued)

PF	PNF

At One Dot From Glideslope Intercept

	CALL "One dot to go."
CALL "Gear down. Before Landing checklist."	
	CALL "Gear selected down."
	When gear indicates down, "Gear indicates down."
	ACTION Complete Before Landing checklist except for full flaps and autopilot/ yaw damper.

When Annunciator Indicates Glideslope Capture

CALL "Glideslope captured."	**CALL** "Glideslope captured."
CALL "Flaps LAND."	
	CALL "Flaps selected LAND."
	When flaps indicate LAND, "Flaps indicate LAND."

If the VOR on the PNF's side is used for crosschecks on the intermediate segment, the PNF's localizer and glideslope status calls are accomplished at the time the PNF changes to the ILS frequency. This should be no later than at completion of the FAF crosscheck, if required. The PNF should tune and identify his NAV radios to the specific approach and monitor.

Precision Approach (continued)

PF	PNF
At FAF	
CALL "Outer marker." or "Final fix."	
	ACTION ▪ Start timing. ▪ Visually crosscheck that both altimeters agree with crossing altitude. ▪ Set missed approach altitude in altitude alerter. ▪ Check PF and PNF instruments. ▪ Call FAF inbound.
	CALL "Outer marker." or "Final fix." "Altitude checks."
At 1,000 Ft Above DA (H)	
	CALL "1,000 ft to minimums."
CALL "Check."	

Precision Approach (continued)

PF	PNF

At 500 Ft Above DA(H)

CALL "500 ft to minimums."

CALL "Check."

NOTE: An approach window has the following parameters:

- within one dot deflection, both LOC and GS
- IVSI less than 1,000 fpm
- IAS within V_{AP} ±10 kts (no less than V_{REF} or 0.6 AOA, whichever is less)
- no flight instrument flags with the landing runway or visual references not in sight
- landing configuration, except for full flaps (non-precision or single engine approaches).

When within 500 ft above touchdown, the aircraft must be within the approach window. If the aircraft is not within this window, a missed approach must be executed.

At 200 Ft Above DA(H)

CALL "200 ft to minimums."

CALL "Check."

At 100 Ft Above DA(H)

CALL "100 ft to minimums."

CALL "Check."

Precision Approach (continued)

PF	PNF
At Point Where PNF Sights Runway or Visual References	
	CALL "Runway (or visual reference) ____ o'clock."
CALL "Going visual. Land," or "Missed approach."	
	ACTION As PF goes visual, PNF transitions to instruments.
At DA(H)	
	CALL "Minimums. Runway (or visual reference) ____ o'clock."
ACTION Announce intentions.	
CALL "Going visual. Land." or "Missed approach."	
	ACTION As PF goes visual, PNF transitions to instruments.

Precision Missed Approach

PF	PNF
At DA(H)	
	CALL "Minimums. Missed approach."
CALL "Missed approach."	
ACTION Apply power firmly and positively. Activate go-around mode and initially rotate the nose to the flight director go-around attitude.	**ACTION** Assist PF in setting power for go-around.
CALL "Flaps APPROACH."	
	CALL "Flaps selected APPROACH."
	When flaps indicate APPROACH, "Flaps indicate APPROACH."
At Positive Rate of Climb	
	CALL "Positive rate."
CALL "Gear up."	
	CALL "Gear selected up."
	When gear indicates up, "Gear indicates up."
	ACTION Announce heading and altitude for missed approach.

Precision Approach Deviations

PF	PNF
± One Half Dot ñ Glideslope	
	CALL "One half dot (high, low) and (increasing, holding, decreasing)."
CALL "Correcting."	
± One Half Dot ñ Localizer	
	CALL "One half dot (right, left) and (increasing, holding, decreasing)."
CALL "Correcting."	
V_{AP} ± ____	
	CALL "Speed (plus or minus) _____ (knots) and (increasing, holding, decreasing)."
CALL "Correcting."	
At or Below V_{REF}	
	CALL "V_{REF}." or "V_{REF} minus _____ (knots below V_{REF})."
CALL "Correcting."	
Rate of Descent Exceeds 1,000 FPM	
	CALL "Sink _____ (amount) hundred and (increasing, holding, decreasing)."
CALL "Correcting."	

Non-Precision Approach

PF	PNF
Prior to Initial Approach Fix	
CALL "Approach checklist."	
	ACTION Complete Approach checklist.
	CALL "Approach checklist complete."
After Level-Off on Intermediate Approach Segment	
CALL "Flaps APPROACH."	
	CALL "Flaps selected APPROACH."
	When flaps indicate APPROACH, "Flaps indicate APPROACH."
At Initial Convergence of Course Deviation Bar	
CALL "Localizer/course alive."	**CALL** "Localizer/course alive."
When Annunciators Indicate Course Capture	
CALL "Localizer/course captured."	**CALL** "Localizer/course captured."

Non-Precision Approach (continued)

PF	PNF
Prior to FAF	
	CALL "_____ (number) miles/minutes from FAF."
CALL "Gear down. Before Landing checklist."	
	CALL "Gear selected down."
	When gear indicates down, "Gear indicates down."
	ACTION Complete Before Landing checklist except for full flaps and autopilot/yaw damper.

Non-Precision Approach (continued)

PF	PNF
At FAF	
CALL "Outer marker." or "Final fix."	**CALL** "Outer marker." or "Final fix." "Altimeters check."
	ACTION ▪ Start timing. ▪ Visually crosscheck that both altimeters agree. ▪ Set MDA (or nearest 100 ft above) in altitude alerter. ▪ Check PF and PNF instruments. ▪ Call FAF inbound.
At 1,000 Ft Above MDA	
	CALL "1,000 ft to minimums."
CALL "Check."	

Non-Precision Approach (continued)

PF	PNF

At 500 Ft Above MDA

CALL "500 ft to minimums."

CALL "Check."

NOTE: An approach window has the following parameters:

- within one dot CDI deflection or 5° bearing
- IVSI less than 1,000 fpm
- IAS within V_{AP} ±10 kts (no less than V_{REF} or 0.6 AOA, whichever is less)
- no flight instrument flags with the landing runway or visual references not in sight
- landing configuration, except for full flaps.

When within 500 ft above touchdown, the aircraft must be within the approach window. If the aircraft is not within this window, a missed approach must be executed.

At 200 Ft Above MDA

CALL "200 ft to minimums."

CALL "Check."

At 100 Ft Above MDA

CALL "100 ft to minimums."

CALL "Check."

At MDA

CALL "Minimums. _____ (time) to go." or "Minimums. _____ (distance) to go."

CALL "Check."

Non-Precision Approach (continued)

PF	PNF
At Point Where PNF Sights Runway or Visual References	
	CALL "Runway (or visual reference) ____ o'clock."
CALL "Going visual. Land. or "Missed approach."	
When leaving MDA, **CALL** "Flaps LAND."	
	CALL "Flaps selected LAND."
	When flaps indicate LAND, "Flaps indicate LAND."

Non-Precision Missed Approach

PF	PNF
At MAP	
	CALL "Missed approach point. Missed approach."
CALL "Missed approach."	
ACTION Apply power firmly and positively. Activate go-around mode and initially rotate the nose to the flight director go-around attitude.	**ACTION** Assist PF in setting power for go-around.
CALL "Flaps APPROACH."	
	CALL "Flaps selected APPROACH." When flaps indicate APPROACH, "Flaps indicate APPROACH."
At Positive Rate of Climb	
	CALL "Positive rate."
CALL "Gear up."	
	CALL "Gear selected up." When gear indicates up, "Gear indicates up."
	ACTION Announce heading and altitude for missed approach.

Non-Precision Missed Approach (continued)

PF	PNF

At V_{REF} +10 and 400 Ft Above Airport Surface (Minimum)

CALL "Flaps UP."

CALL "Flaps selected UP."

When flaps indicate UP, "Flaps indicate UP."

At 1,500 Ft (Minimum) Above Airport Surface and Workload Permitting

CALL "Climb checklist."

ACTION Complete Climb checklist.

CALL "Climb checklist complete."

Non-Precision Approach Deviations

PF	PNF
± One Dot ñ Localizer/VOR	
	CALL "One dot (right, left) and (increasing, holding, decreasing)."
CALL "Correcting."	
± 5 At or Beyond Midpoint for NDB Approach	
	CALL "____ (degrees off course) (right, left) and (increasing, holding, decreasing).
CALL "Correcting."	
V_{AP} ± ____	
	CALL "Speed (plus or minus) _____ (knots) and (increasing, holding, decreasing)."
CALL "Correcting."	
At or Below V_{REF}	
	CALL "V_{REF}." or "V_{REF} minus _____ (knots below V_{REF})."
CALL "Correcting."	
Rate of Descent Exceeds 1,000 FPM	
	CALL "Sink _____ (amount) hundred and (increasing, holding, decreasing)."
CALL "Correcting."	

Visual Traffic Patterns

PF	PNF

Before Pattern Entry/Downwind (1,500 Ft Above Airport Surface)

CALL "Approach checklist."

ACTION Complete Approach checklist.

CALL "Approach checklist complete."

Downwind

CALL "Flaps APPROACH."

CALL "Flaps selected APPROACH."

When flaps indicate APPROACH "Flaps indicate APPROACH."

CALL "Gear down. Before Landing checklist."

CALL "Gear selected down."

When gear indicates down, "Gear indicates down."

ACTION Complete Before Landing checklist except for full flaps and yaw damper.

Visual Traffic Patterns (continued)

PF	PNF
At 1,000 Ft Above Airport Surface	
	CALL "1,000 AGL."
CALL "Check."	
At 500 Ft Above Airport Surface	
	CALL "500 AGL."
CALL "Check."	
At 200 Ft Above Airport Surface	
	CALL "200 AGL."
CALL "Check."	

Landing

PF	PNF
At Point on Approach When PF Sights Runway or Visual Reference (Landing Assured)	
CALL "Going visual. Land. Flaps LAND."	
	CALL "Flaps selected LAND."
	When flaps indicate LAND, "Flaps indicate LAND."
ACTION Push autopilot and trim disconnect switch.	**ACTION** Continue with: ▪ speed check ▪ vertical speed check ▪ callouts ▪ gear down verification ▪ flap verification.
CALL "Autopilot/yaw damper off."	
	CALL "Final gear and flaps recheck." "Before Landing checklist complete."
At 100 Ft Above Touchdown	
	CALL "100 ft."
At 50 Ft Above Touchdown	
	CALL "50 ft."
At Touchdown	
CALL "Extend speedbrakes."	
	ACTION Extend speedbrakes.
	CALL "Speedbrakes extended."

Landing (continued)

PF	PNF
As Thrust Reversers Deployment	
	CALL "Six lights."
At Thrust Reverser Idle Speed (60 KIAS)	
	CALL "60 kts."