

**CHAPTER 2**

**CREW COORDINATION PROCEDURES**

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## INTRODUCTION

This chapter describes some of the standard operating procedures for the operation of the BSU Piper PA-34-200 Seneca, with the goal of maintaining the safest flying and training environment possible. These guidelines and procedures have been established using a CRM approach and are designed to provide a high level of safety in both single and multi-pilot operations.

## DEFINITIONS

- PF – Pilot Flying (pilot actually manipulating the flight controls)
- PMF – Pilot Monitoring Flight (pilot who, while not actually manipulating the controls, actively monitors the flight)
- PUI – Pilot Under Instruction
- PIC – Pilot In Command (pilot who is in charge of the flight, regardless of who is the PF)
- SOP – Standard operating procedure
- MEI – BSU Authorized FAA Multi-engine CFI
- Chairflying (Dry time) – Practicing checklists and procedures on the ground in either:
  - An actual airplane (pretending to move controls and switches but NOT actually moving them or activating any aircraft systems)
  - A simulator
  - A cockpit mockup
- Flow – a way to execute checklists and SOPs mainly from memory (with some specific exceptions) where the sequence logically “flows” from one step to the next
- Checklist – A checklist is NOT a do list (with some specific exceptions) but primarily a written reference to verify a flow has been performed correctly and to catch any items that may occasionally be missed due to imperfection of human memory

## PIC AUTHORITY

Regardless of who is the PF, PUI or the PMF at any particular moment, the flight crews are reminded that ultimately, on any flight, the BSU designated CFI/MEI is the PIC.

When the situation demands, the MEI will take whatever action necessary for the safe conduct of the flight, and the PF/PUI will comply with the PIC instructions immediately. This does not preclude the other crewmember from making suggestions or asking questions, if appropriate to the situation.

In the situations where there are two MEIs onboard, the most senior MEI will be the PIC of the flight, unless otherwise agreed to before the flight.

### CAUTION

***BSU Flight Instructors are the PIC on any dual flight training event and are therefore responsible for the safe outcome of the flight. In any emergency, the PIC may take the flight controls from the PF if necessary.***

## **SINGLE vs. MULTI-PILOT OPERATIONS**

During training operations the procedures and maneuvers will be completed by the PF/PUI, with the pilot acting as a single pilot. The expectation is that the PUI is trained to operate entirely without assistance as a single pilot, in accordance with the latest FAA AMEL Commercial PTS.

This, however, does not preclude the option or, in certain circumstances, the necessity for the crew to act as a coordinated team. The flight crew is expected to adhere to the following procedures at all times. Where this is deemed not possible, sound crew judgment shall be used.

The MEIs have the flexibility to practice CRM and crew coordination procedures, as appropriate, to introduce the PUI to multi-cockpit environment, as long as the PUI single pilot competence is not compromised, and the overall training goal of single pilot competence is achieved.

While not relinquishing in any way their PIC authority, the MEIs are reminded that the PUIs are trained to be future PICs. The training should be conducted in such a manner that the PUI acts and thinks in all aspects of flight as if s(he) was the PIC, and not allowed to lapse into “I am just a student” mentality.

## **CHECKLISTS, FLOWS and SOP EXPLAINED**

Proper and accurate execution of flows and checklists is a hallmark of a professional pilot. As such, a professional pilot realizes that human memory cannot be entirely relied upon, thus written checklists are a necessity. Committing procedures to memory in the way of a flow is an excellent way to speed up checklist execution, as long as verification using written checklists is performed, and memory limitations are realized and respected. Majority of crew-caused accidents resulting in aircraft loss can be attributed to not following checklists and/or standard operating procedures. As such, flows and checklists complement each other, and together they constitute a complete procedure execution and verification system.

Checklist methodology may be addressed from two different angles:

*HOW the flows and checklists are performed and WHO performs the flows and checklists*

How the checklists are performed depends on the type of checklist methodology used and does not depend on which pilot, or how many pilots, perform a particular checklist. One pilot could perform all required checklist items, including verification, or two pilots may perform the same checklist, dividing the workload, and creating redundancy in the process of checking each other. Airline crews cross-check each other during checklist execution to specifically prevent missing any checklist items.

Who performs a checklist depends on the type of checklist, particular operation, safety and efficiency considerations and organizational rules and procedures.

## **HOW checklists are performed**

### **Checklist items and aircraft controls**

A control can be a lever, a switch, a toggle, a wheel, a knob, any other moveable aircraft control or a combination thereof. An item can be an action to be performed at the appropriate time on the checklist, or a combination of a specific control and a particular action to be performed on that control. From this point forward, the words “control” and “item” in conjunction with checklists and SOPs will be used interchangeably to mean any and all of the above, unless otherwise specified.

### **Checklist action**

Action is taken on a particular checklist item, such as SET, CHECKED, VERIFIED, etc. These terms are explained below.

### **Checklist flow**

Checklist items are performed by memory, in logical order of execution. Procedural steps are completed in such a manner as to “flow” from one area of the cockpit to the next in a logical manner. A necessary checklist ITEM is identified, and then the appropriate ACTION is performed. It is then repeated for the next item.

Note that a checklist flow is a concept, NOT a stand-alone checklist execution methodology. A flow is only half of a checklist execution method, with the other half being verification. All flows must be verified with the checklist IN-HAND. Performing an unverified flow is unacceptable during normal operations.

#### **NOTE**

**All BSU Aviation Checklists shall be verified with the checklist in-hand.**

### **Checklists containing solid horizontal lines**

Some checklists contain a solid horizontal line to divide them into logical portions that still fall under the same checklist. Perform the checklist flow down to the line. Time permitting, verify the items down to the line with the checklist in-hand. Perform the rest of the checklist flow after the line, then verify the entire checklist or the remainder of the checklist, as appropriate, thus completing the checklist.

### **Deferring checklist items**

The danger of deferring a checklist item is that the item can be forgotten and never acted upon later. This can (and has) result in situations like improper landing configuration, fuel starvation and gear-up landings. The checklist flows have been designed to minimize the need for deferring any critical item. It is recognized that occasionally, deferring an item may be operationally necessary, but should be avoided whenever possible.

### **Left to Right, Top to Bottom Flow Concept**

Some flows must be performed in a precise sequence. Other flows may offer a choice of order in which to perform the necessary items. As pilots are used to reading, and the reading is done left to right, top to bottom, it is logical to take the same approach to flows when situation permits.

The flows that lend themselves particularly well to this idea are setting/checking the flight instruments and setting/checking the avionics/transponder prior to takeoff. By using a familiar left to right, top to bottom approach, potential for missing items is minimized.

### **Do/Verify Checklist Execution Method**

Sometimes also referred to as a Flow/Confirm method; Checklist items are performed as a logical flow by memory, and then verified with the checklist in hand.

### **Read/Do Checklist Execution Method**

Checklist items are read off the checklist one by one, and performed in that order.

#### **NOTE**

**The BSU Seneca Normal and Emergency Checklists will be accomplished using the Do/Verify Method.**

**The BSU Seneca Abnormal Checklists will be accomplished using the Read/Do method.**

### **Checklist interruption**

If a checklist is interrupted, it **MUST** be restarted from the beginning.

### **Checklist start/completion**

Checklist name is stated prior to checklist execution. After the checklist is executed in its entirety, the fact is acknowledged by stating that the appropriate checklist is complete (refer to the Callouts section of this chapter)

### **Challenge/Response verification**

A method of checklist verification that is applicable to both Do/Verify and Read/Do methods of checklist execution. An item on a checklist is challenged, the correct action is performed (read/do method) or has already been performed (do/verify method) and then is verified with the checklist in hand, with the proper response being verbalized.

## **Memory Aids to checklist execution**

While not a replacement for proper checklists, memory aids (mnemonics) such as acronyms can be extremely helpful in order to assist with efficient checklist execution (i.e. GUMP for before landing, “Lights/Camera/Action” for takeoffs, ABCD for engine emergencies)

## **Specific item condition to be stated in verification**

Whenever possible, the checklists will indicate the actual action to be performed rather than a generic response. Some checklist items (such as flaps, mixture, lights, etc.) may have multiple possible conditions indicated by the use of words such as “SET” and/or “AS REQUIRED” on the checklist. They are not specific actions or verification responses, but rather indicate that the flaps, for example, are to be set as appropriate to the conditions. During the verification phase, the response must indicate the specific condition to which the control has been set.

- **SET** – means the control is set to the appropriate position for the conditions. Specify during verification what the control is specifically set to
  - “FLAPS ..... SET 10°” rather than just “FLAPS..... SET” - an incorrect verification response
- **AS REQUIRED** – means the control is adjusted as required for the conditions
  - “MIXTURE..... FULL RICH” or “MIXTURE..... LEANED FOR TAXI”; “as required” is never an appropriate verification response
- **CHECKED** – generic response meaning the control is evaluated to be operational, and also VISUALLY checked, to the extent possible, to be in the correct position
  - “PROPELLER AND SPINNER.....CHECKED” indicates the propeller condition and operational status has been evaluated appropriately
  - “TRIM..... SET for TAKEOFF” in the cockpit, then visually” ..... CHECKED” to be in the correct position on the stabilator
  - “PROPELLER GOVERNOR.....CHECKED” means that propeller governor equipment tests have been completed
- **IDENTIFIED** – means the proper control for the desired action is identified
  - “FLAPS..... IDENTIFIED”; Flap lever is positively identified prior to retraction of flaps on the ground, as opposed to the gear lever. Such identification can prevent accidental gear retraction on the ground.
- **VERIFIED** – means the control is verified to be the desired control and not something else
  - “FLAPS ..... VERIFIED”; as the lever is verified to be the flap, and not the gear lever.
- **CONFIRMED** – means the control is VISUALLY confirmed to be in the correct position
  - “FLAPS..... CONFIRMED UP”; after visually confirming by looking at the flaps on the wings that they have fully retracted.

## **WHO performs the checklists**

The methodologies described above are appropriate to both single and multi-pilot operations.

Unless instructionally beneficial or otherwise called for by particular situation (see the previous section), during normal BSU training operations *the PF / PUI will perform all flows and checklists as if s(he) were alone*. The PMF / MEI may elect handle radio communication, if appropriate, to allow for uninterrupted flow to be completed by the PF.

The verification of the items performed will be accomplished using the **Challenge/ Response** methodology. When performing Normal / Emergency checklists as a single pilot during training operations, the PUI will first perform the appropriate flow, then use the written checklist to verify the items performed, by challenging each item and indicating the appropriate response.

During actual emergencies, the MEI / PIC is responsible for performing and verifying the emergency box items, regardless of who is actually flying the plane.

## **EXAMPLES of checklist execution**

### **Single Pilot Checklist Execution**

During Normal procedures, PF / PUI performs the Before Landing Checklist as if s(he) were alone, using the Do/Verify method:

1. **PF** performs the flow, by memory, to include all necessary checklist items
2. **PF** states: "Before Landing Checklist"
3. **PF**, with the written checklist visible/readable, verbally and visually verifies each item on the checklist. (Challenge: "Mixtures" Response: "Full Rich", etc.)
4. Any missed items are identified and performed during the verification process.
5. **PF** states: "Before Landing Checklist Complete"

During Abnormal procedures, PF / PUI performs the Manual Gear Extension Checklist, using the Read/Do method:

1. **PF** states: "Manual Gear Extension Checklist"
2. **PF** reads ONE checklist item from the visible/readable checklist.
3. **PF** performs the action, then verbally and visually verifies the completed item. (Challenge: "Landing gear lights" Response: "Checked", etc.)
4. **PF** performs steps 2 and 3 on the remainder of the checklist items.
5. **PF** states: "Manual Gear Extension Checklist Complete"

## **Multi-Crew Checklist Execution:**

During Normal procedures, PF and PMF perform the Before Landing Checklist together, using the Do/Verify method:

1. **PF** performs the flow, by memory, to include all necessary checklist items.
2. **PF** states: “Before Landing Checklist”
3. **PMF**, with the written checklist in-hand, challenges one item at a time. (Challenge: “Mixtures”, etc.)
4. **BOTH PF AND PMF** visually verify the item in question (checking that the both mixtures are indeed full rich).
5. After verification, **PF** responds to the challenge. ( Response: ”Full Rich”, etc.)
6. Next item is challenged and verified, in accordance with Steps **3** through **5**.
7. Any missed items are identified and performed during the verification process.
8. **PMF** states: “Before Landing Checklist Complete”

## **SOP – Standard Operating Procedures**

### **Introduction**

It must be recognized that an airplane cannot be operated safely and efficiently by simply reading a checklist, with some very specific exceptions. Multiple procedures must be accomplished from memory to increase safety, efficiency and to minimize head-down time in the cockpit. Such procedures are often limited as to the time available for their execution, or are coupled to other tasks occurring simultaneously, whereas the pilot may reach task saturation, thus committing errors or neglecting collision avoidance.

### **SOP Concept**

Standard operating procedures are developed to be executed from memory for such tasks where it would be impractical, unsafe or otherwise inappropriate to spell out each item of the procedure on a checklist. They vary from relatively long procedures that must be executed smoothly, timely and in the proper sequence (i.e. Engine start), to such safety related items that must be done every time aircraft is moved (i.e. Clearing taxi areas). You will find SOPs used throughout this manual.

### **SOP knowledge and practice**

As is with any memory flow, SOP proficiency can only be obtained while chairflying. SOP execution must become automatic so attention is not taken away from controlling the aircraft. This requires significant time spent practicing outside of just flying the airplane. All flight crews shall be thoroughly familiar and demonstrate complete SOP knowledge.



**SOPs during flows and checklist execution**

SOPs are explained in the appropriate sections of expanded checklists in this manual. SOPs must be executed from memory.

- Where appropriate, the checklists may indicate applicable multi-step SOP to be executed in *CAPITAL ITALICS*.
  - *Example: ENGINE START (SOP).....COMPLETED*
- The ► symbol will be used in this manual to indicate where a SOP must be performed, but that is not included on the checklist itself.
  - *Example: ► TAXI AREA.....CLEAR*
- Whenever a SOP involves multiple steps or an explanation, SOP descriptions may be enclosed in a distinct box for easy identification; it may be followed by expanded SOP with explanations of each step when warranted. The items in this box are not included on the checklist itself.
  - *Example:*

***SOP Name***

*Step 1 .....Action*  
*Step 2.....Action*

***SOP Name, EXPANDED***

*Step 1 .....Action*  
*Step1 action explained.*

*Step 2.....Action*  
*Step 2 action explained.*

- In-flight SOP memory flows that are not part of the printed checklist may be presented as a grey box followed by the necessary steps in italics and expanded explanations, as appropriate.

- *Example:*

***PROCEDURE NAME (SOP)***

*STEP 1.....ACTION*

*STEP 2.....ACTION*

## **STERILE COCKPIT PROCEDURES**

Sterile cockpit means limiting the conversation between crewmembers to only those items that are operationally and/or instructionally necessary for the current phase of flight.

Sterile cockpit shall be adhered to during any of the following:

- Ground taxi
- Takeoff, landing, traffic pattern and terminal operations
- Anytime at or below 1,000' AGL
- During any phase of Instrument Approaches
- During any practice area maneuvers

## **POSITIVE EXCHANGE OF FLIGHT CONTROLS**

Any flight control exchange should be clearly verbalized using the three-way positive flight control exchange philosophy. If the autopilot is used, it should be stated as such during the control exchange as to prevent any surprise to the new PF who might not have been aware of the autopilot usage.

## **LANDING GEAR VERIFICATION**

The procedures for gear verification are mandatory, cannot be abbreviated, and must be strictly adhered to.

**PIC will call for, and the PF will immediately initiate a go-around regardless of the gear indications if any of the following occurs:**

- **GUMP check is not complete by 200 AGL**
- **PF / PMF short final gear verification is not complete prior to landing flare**
- **Gear warning horn activates on short final or in the landing flare**

### **NOTE**

In case of a PUI who fails to take immediate action, the PIC / MEI shall take controls and proceed with the go-around. Delaying a go-around and last second attempts at gear verification in order to “salvage” a non-emergency landing are prohibited.

## **CIRCUIT BREAKER RESET POLICY**

### **Introduction**

It has been found through experience, that resetting a popped (out) circuit breaker (even once, to the best of pilot's knowledge) to see if it pops again, may lead to an inadvertent fire, turning a relatively minor problem (loss of a particular electrical circuit) into a major emergency. The following advice is designed to minimize risk and is general in nature. It is not to be used as a substitute for sound judgment or manufacturer-approved emergency procedures contained in the appropriate Aircraft Flight Manual.

### **Popped circuit breaker discovered during preflight**

Do not reset the breaker. Notify dispatch who will then notify maintenance. The aircraft is considered unairworthy until appropriate action is taken and the aircraft is cleared by maintenance.

### **Circuit breaker pops during flight**

Do not immediately reset the breaker. Consider if the affected electrical circuit is necessary for a safe conclusion of the flight, and what alternative courses of action are available. If at all possible, avoid resetting the circuit breaker. Enroll ATC assistance and divert to the nearest appropriate airport if the situation demands.

## **STANDARD CALLOUT PROCEDURES**

All BSU callouts are considered mandatory SOP and are listed below. They will not be specifically repeated in descriptions of maneuvers and procedures, except where it is deemed appropriate to do so.

### **Training flights**

During normal training events the PF/PUI will be operating as a single pilot, and will make the standard callouts indicated below.

### **Non-training flights / Urgent situations / Emergencies**

During non-training flights, as well as during urgent or emergency situations, flight crews will work as a team utilizing crew coordination procedures, as previously described, for a successful flight outcome. The PIC will designate the pilot who will make all required callouts.

## Callouts - All Operations

<b>Pilot action:</b>	<b>Pilot calls out:</b>
<p><b><i>Prior to performing any checklist:</i></b> Verify the correct checklist is about to be performed. Example: Verify the correct checklist is about to be performed prior to execution of Before Engine Start Checklist.</p>	<p>“[Appropriate name] Checklist”  Example: “Before Engine Start Checklist”</p>
<p><b><i>On completion of any checklist:</i></b> Verify that all items on the appropriate checklist are complete. Example: Verify that all items on the Before Engine Start Checklist are complete.</p>	<p>“[Appropriate name] Checklist Complete”  Example: “Before Engine Start Checklist Complete”</p>
<p><b><i>During control exchanges on the ground and in the air:</i></b> Use three-way positive control exchange technique.</p>	<p>Pilot relinquishing controls: “You have the controls” Pilot accepting controls: ” I have the controls” Pilot relinquishing controls: “You have the controls”</p>
<p><b><i>When encountering a horizontal line on a checklist:</i></b> Verify that all checklist items down to the line have been performed.</p>	<p>“Down to the line”</p>
<p><b><i>When deferring a checklist item to be performed at a later time (avoid whenever possible)</i></b></p> <ol style="list-style-type: none"> <li>1. State which item has been deferred during the flow</li> <li>2. State that the checklist has been deferred.</li> <li>3. When appropriate, perform the deferred items.</li> <li>4. Verify the checklist with the checklist in hand.</li> </ol> <p>Example:</p> <ol style="list-style-type: none"> <li>1. PF decides to defer flap deployment while completing the rest of the flow</li> <li>2. PF defers the checklist</li> <li>3. PF deploys flaps when appropriate</li> <li>4. PF verifies the checklist with the checklist in-hand</li> </ol>	<ol style="list-style-type: none"> <li>1. “[Item name] deferred”</li> <li>2. “[Checklist name] checklist deferred”</li> <li>3. “[Item name] [action performed]”</li> <li>4. “[Checklist name] checklist complete”</li> </ol> <p>Example:</p> <ol style="list-style-type: none"> <li>1. “Flaps deferred”</li> <li>2. “Before landing checklist deferred”</li> <li>3. “Flaps are down”</li> <li>4. “Before landing checklist complete”</li> <li>5.</li> </ol>
<p><b><i>After the PUI receives specific altitude /heading/airspeed instructions from the MEI / PIC:</i></b> State the new altitude, heading and airspeed,</p>	<p>“Climb/descend [new altitude], left/right turn</p>

<p>as appropriate. Example: The MEI instructs the PUI to climb to 3,500' MSL and simultaneously make a right turn to the heading of 060°. The PUI confirms the instruction.</p>	<p>to [new heading], maintain [new airspeed] Example: MEI: "Make a right climbing turn to 3500, heading 060" PUI responds: "Climb to 3500, right to 060"</p>
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## Callouts - Ground Operations

<b>Pilot action:</b>	<b>Pilot calls out:</b>
<p><b><i>Prior to engaging engine starter:</i></b> Clear the area to the left, center and right, open window.  Listen for any response while continuing to visually clear propeller area.</p>	<p>Loudly, so it can be heard clearly outside: "Clear prop!"  "Left, center, right is clear"</p>
<p><b><i>Prior to moving aircraft from a parked position:</i></b> Clear the area to the left, center and right</p>	<p>"Taxi area is clear"</p>
<p><b><i>Prior to turning, crossing an intersection or a runway:</i></b> Clear the area to the left, center and right</p>	<p>"Left, center, right is clear", as appropriate.</p>
<p><b><i>Prior to taking a runway for departure:</i></b> Verify there is no aircraft on final approach, or still on the runway of intended use.</p>	<p>"Final approach is clear, runway is clear"</p>
<p><b><i>After takeoff power has been applied:</i></b> Verify full power is being developed. Check that engine instruments are normal. Check that airspeed indicator is functioning.</p>	<p>"Power indications - normal" "Engine instruments - normal" "Airspeed - alive"</p>
<p><b><i>Upon reaching Vr:</i></b> Check airspeed and rotate.</p>	<p>"[States the actual airspeed], rotating"</p>
<p><b><i>Prior to retracting flaps on the ground:</i></b> The PF will place a hand on the flap lever after positively identifying it.  The PMF will verify that PF hand is on the flap lever.  The PF will retract the flaps only after hearing the PMF verification</p>	<p>PF: "Flaps IDENTIFIED"  PMF: "Flaps VERIFIED":  PF: "Flaps set to [actual degrees]"</p>
<p><b><i>Prior to any takeoff:</i></b> Verify that trim is set for takeoff.  Verify that flaps are set for takeoff.</p>	<p>"Trim set for TAKEOFF"  " Flaps set to [actual degrees] "</p>

## Callouts – Flight Operations

<b>Pilot action:</b>	<b>Pilot calls out:</b>
<b>After rotation:</b> Verify positive climb rate is being achieved.	“Positive rate”
Identify when no usable runway remains.	“No runway remaining”
Retract the landing gear only when no runway remains.	“Gear in transit”
Verify landing gear indicators.	“Gear is up and stowed”
<b>After takeoff with simulated or actual obstacles:</b> Retract flaps as specified in the appropriate procedure.	“Clear of obstacles, flaps up”
<b>Prior to making a turn in the traffic pattern:</b> Clear the area in the direction of the turn.	“Left/ right is clear”, as appropriate
<b>Downwind midfield in the traffic pattern, or when less than 3 miles remain to the runway threshold (in case of a non-standard approach, such as ATC assigned straight-in approach):</b> Extend the landing gear. Verify landing gear indicators.	“Gear in transit” “Gear is down, three green, no red, one in the mirror”
<b>Prior to turning on final approach in the traffic pattern:</b> Verify there is no aircraft on final approach or opposite base.	“Final approach clear, opposite base clear”
<b>Established on base or final approach, by 300’ AGL:</b> Perform the GUMP check.	“Gas.....Fuel Selectors –ON” “Undercarriage... Three green, no red” “Mixtures..... Full rich” “Props.....Full Forward”
<b>On short final, no lower than 200’ AGL:</b> PF shall ask PMF to verify the landing gear is down. PMF shall verify the gear is down or call a go-around.	PF: “Verify gear is down”  PMF: “Gear is down, Continue” or “Gear is NOT down, GO-AROUND”
<b>Any time on short final and below 300’ AGL:</b> PF will initiate an immediate go around if gear warning horn sounds, regardless of gear indications.	PF: “Gear warning horn, going around”
<b>Prior to performing any maneuvers:</b> Verify pre-maneuver checklist items. Conduct clearing turns.  Perform Vmc and aircraft configuration brief, if appropriate to the maneuver.	“Pre-maneuver checklist complete” “Clearing turns complete”  “In the event of loss of directional control, ➤ BOTH THROTTLES to IDLE ➤ PITCH DOWN to increase

	<p>AIRSPPEED</p> <ul style="list-style-type: none"> <li>➤ RUDDER opposite the direction</li> <li>ROLL/YAW</li> <li>➤ REGAIN directional control</li> </ul> <p>Vmc is [State actual airspeed] ;  Gear is [UP or DOWN];  Flaps set to [number of degrees]”</p>
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**Callouts - Instrument Procedures**

<b>Pilot action:</b>	<b>Pilot calls out:</b>
<p><b><i>On precision approach:</i></b>  Note when the localizer needle starts moving, indicating positive course guidance.</p> <p>Note when the glideslope needle starts moving, indicating positive vertical guidance.</p> <p>Note when glideslope needle passes through last dot approaching desired glideslope intercept (typically, your FAF)</p>	<p>“Localizer alive”</p> <p>“Glideslope alive”</p> <p>“Glideslope – 1 dot”</p>
<p><b><i>On non-precision approach:</i></b>  Note when the appropriate needle begins indicating positive course guidance, if using vectors to final.</p> <p>Note when CDI passes through last dot approaching desired course intercept.</p> <p>Approx. ½ mile from FAF</p>	<p>“CDI Alive”</p> <p>“CDI - 1 dot”</p> <p>“FAF – half mile”</p>
<p><b><i>On any instrument approach:</i></b>  When at 500 feet above DA/MDA</p> <p>When at 200 feet above DA/MDA</p> <p>When at 100 feet above DA/MDA</p> <p>When at DA/MDA and/or MAP</p> <p>If 91.175 requirements are met, continue the approach.</p> <p>Otherwise, execute missed approach.</p> <p>When at 100’ above TDZE:  If 91.175 requirements are met, continue to the landing runway.</p> <p>Otherwise, execute missed approach.</p>	<p>“500 above”</p> <p>“200 above”</p> <p>“100 above”</p> <p>“At DA/MDA” and/or “At MAP”</p> <p>“Approach lights” and/or “Going visual”</p> <p>“Going missed”</p> <p>“Going Visual” and/or “Landing”</p> <p>“Going missed”</p>
<p><b><i>Deviations during an instrument approach:</i></b>  Localizer / CDI - off by ½ scale; Make the callout while correcting.</p>	<p>“Localizer (or CDI) – half scale “</p>

<p>Glideslope – off by 1 dot; Make the callout while correcting.</p> <p>Airspeed +/-10 knots or more of the desired KIAS; Make the callout while correcting.</p> <p>Vertical speed in excess of 1,000 FPM below 1,000’ AGL; Make the callout while correcting.</p>	<p>“Glideslope – 1 dot”</p> <p>“Airspeed is [state actual value]”</p> <p>“Vertical speed is [state actual value]”</p>
<p><b><i>Enroute operations:</i></b></p> <p>Note when passing within 1000’ of the desired level-off altitude during climbs and descents.</p> <p>Example 1: While climbing through 2,000’ MSL to 3,000’ MSL</p> <p>Example 2: While descending through 4,000’ MSL to 3,000’ MSL</p>	<p>“[Altitude passing through] to [Level-off altitude], 1000’ to go”</p> <p>Example 1: “2000 to 3000, 1000 to go”</p> <p>Example 2: “4000 to 3000, 1000 to go”</p>