Piper Seneca PA-34

Standard Operating Procedures

Photo by: Philip Craig

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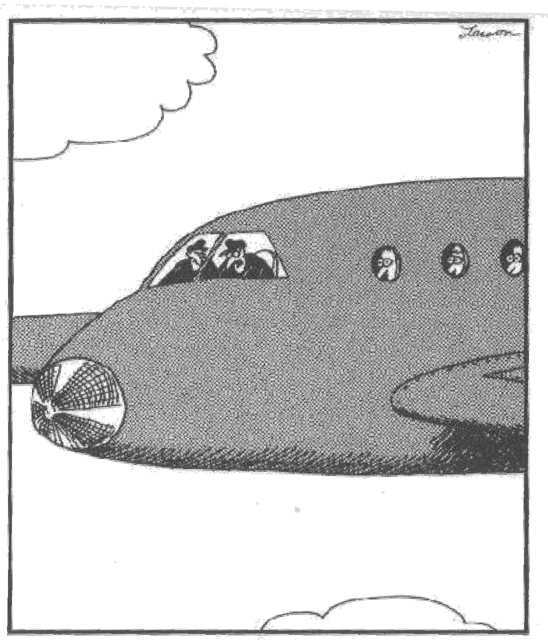
Introduction to Standard Operating Procedures

Background

Standard Operating Procedures are just what the phrase says—they are standardized procedures used by all persons conducting flight operations. Quite simply, the rationale behind them is safety. If everyone conducts himself or herself in a standardized, predictable fashion, then there are no surprises, there is no confusion, and safety—in general—is enhanced as depicted in *The Far Side (December 5, 2007)* comic below:



"The fuel light's on, Frank! We're all going to die! … Wait, wait. … Oh, my mistake— that's the intercom light."

For those you who move on to multi-crew operations, *Standard Operating Procedures*—or SOPs—will become a professional way of life. SOPs have been central feature of the Langley Flying School Commercial Pilot Program, and it is logical and appropriate to extend them into this program. For commercial students, then, the multi-engine SOPs will not feel that alien—there are only slight variations that reflect the specific requirement of advance aircraft operations and procedures. For Private Pilots enrolled in this program, however, this will likely be the first time they are exposed to the SOP patterns of flying—it may feel awkward at first, but with time they will quickly make sense and feel comfortable.

Our motivation for including SOPs in Langley Flying School's advanced training programs was a story relayed to us by a fresh commercial pilot who was selected for right-seat training on a King Air. The fellow was not successful for many reasons—the employer provided piecemeal training, unfortunately owing to limited recourses, but the candidate was particularly hung-up with a new form of flying in which his tasks in the cockpit were limited to select actions and calls—SOPs. He had received inadequate training during his training at the flight-school level.

SOPs are primarily made up of actions and cockpit calls made by crewmembers during flight, but SOPs also extend into pre-flight activity. All training flights are preceded with a weather briefing and a weight and balance calculation at Langley Flying School. This in a very basic form is an example of an SOP. Perhaps the best description of SOPs is that they are a script that everyone in a company shares and practice during every flight. As with any script, the content must be memorized.

The PF, PNF, and PIC

Normally, SOPs establish complementary tasks for specific phases of a flight operation for two roles—the "pilot flying" (PF) and the "pilot not flying" (PNF). These tasks are associated with calls—e.g., "gear up"—made in this case by the PF—and actions—e.g., the PNF raises the gear and responds "gear in transit". Normally the PF and PNF responsibilities are for the most part independent of who is PIC and who is SIC (second-in-command); instead the PF and PNF designation normally switches between the PIC and SIC on each leg, and served the purpose of both individuals maintaining and developing their flying skills.

During multi-engine training, it is not the roll of the instructor to function as either the PF or PNF, yet training can be conducted in a fashion that best prepares especially commercial pilot students for their future multi-crew work place. Accordingly, the SOPs set out below are orientated to single-pilot flight, and are therefore *PF-focused*—there are no procedural responses or inputs by a PF. The PF is, in effect, the student acting as pilot-in-command. The goal of this SOP program is not so much functional in nature, but to encourage you to *think* standardized multi-crew operations—hopefully your transition to a multi-crew job will be "comfortable" as a result of this training.

As a rule, pilots should never deviate from SOPs; research has clearly established that when deviation occurs, there is greater probability of an occurrence or accident. The Langley Flying School SOPs for multi-engine flight operations conform with aspects of *CAR* 723.107 (Air Taxi SOPs). They must be memorized and practiced in association with all training flights.

Checklist Format

Two checklist formats will be used during this course, the first is referred to as *flow-checks*, and the second is *self-challenge/response*.[1] The *flow-checks* method requires that the checklist sequence is first completed from memory, and then the checklist is reviewed to ensure that all items contained on the checklist for the specified phase are double-checked—the items are read from the checklist and physically or visually confirmed. In contrast, the *self-challenge/response* method requires that all items be

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[1] The format typically used in civil aviation combines the *flow-checks* and the *challenge/response* format, with items being accomplished by the memory first, then backed up by the double-check *challenge/response* (Gregory N. Brown and Mark J. Holt, *The Turbine Pilot's Flight Manual*, 1995, Ames: Iowa State University Press, pp. 102-103). Generally, *challenge/response* is typically used for critical phases of flight, while flow-checks are used for more rote tasks. The idea here is simply is to be knowledgeable of variations in formats. Overall, *challenge/response* is specifically adapted to multi-crew operations, and has limited application in single-pilot operations; nevertheless, the *challenge/response* format can be modified to a "*self*-challenge/response" and incorporated into single-pilot checklist procedures when the workload is low—e.g., engine start and pre-takeoff check. Instead of working through a checklist as a two-pilot team, the *self-challenge/response* process can be said out-loud and monitored by the Flight Instructor. By comparison, the *flow-checks* format is especially adaptive to single-pilot airborne checks where typically the work-load is high—during an approach, for example. Throughout it all, the key is to *verbalise* the checklist process.

sequentially completed as the checklist is read. While the flow-check method is applied silently, the self-challenge/response method must be verbalized, with each item being physically touched for confirmation. Throughout this program, the self-challenge/response format shall be applied to *all checklist groups prior to runway and takeoff procedures*, while the flow-check format shall be applied to *the runway and takeoff checklist groups, as well as all airborne groups, including the pre-landing checklist.*

Photo by: Matt Roersma

Special Notes About Departures

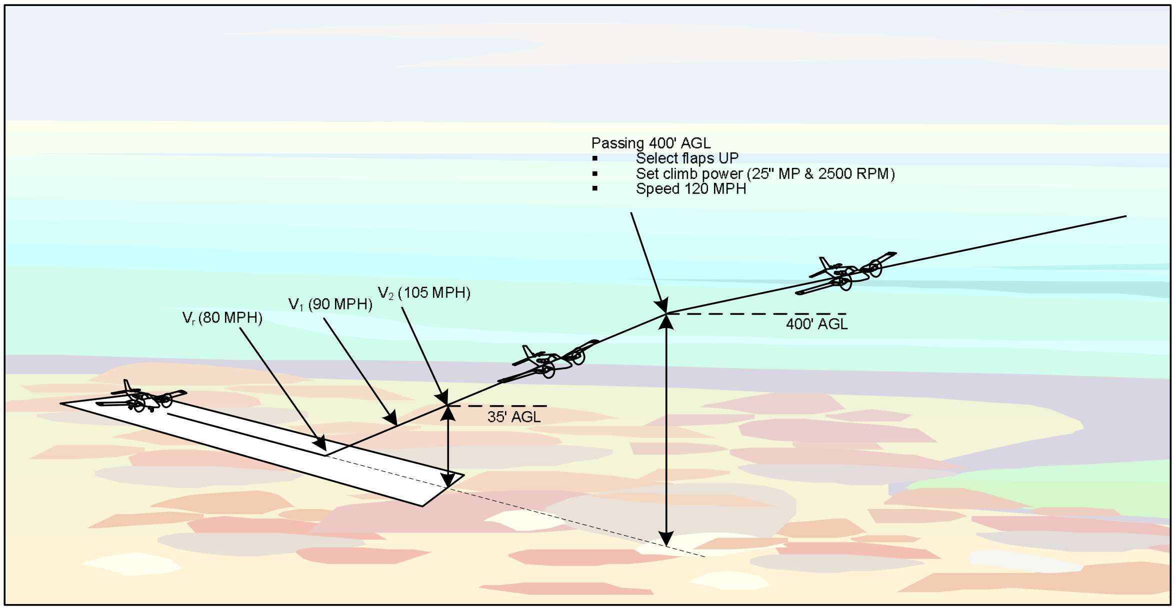
In light twin engine aircraft, the departure phase of flight is very precarious as rotation is often near or at V_{mc} leaving a large gap between V_{mc} and V_{sse} or V_{yse}. This gap leaves a gray zone for pilots about how to handle a situation with an engine failure on departure. For this reason, the SOPs will be clearly defined in the following sections to remove ambiguity and define what a departure should look like.

Departure Segments

The departure following takeoff is composed of three segments. The *First Segment* begins at rotation and ends when the aircraft is established at V_2.[2] The *Second Segment* begins with V_2, and lasts until the aircraft achieves 400' AAE. The final *Third Segment*, in turn, begins through the 400' AAE transition and lasts until the aircraft reaches the initial cruising altitude. The departure segments and the related speeds for the Seneca are as follows:

[2] V_2 is simply the initial climb speed achieved in the departure—it is the speed typically used to get the aircraft initially to safe altitude in the quickest time possible. In normal departures V_2 will be equivalent to the best-rate climb speed, but if obstacles are present along the departure path, V_2 will be the best-angle climb speed. In is customary for the V_2 speed to be flown to a minimum of 400' above the airport elevation (AAE) as this is in conformity with the standard departure requirements for IFR aircraft—where, in accordance with *CAR* 602 an aircraft, unless specified otherwise, must cross the departure end of a runway with a minimum of 35', must climb on a runway heading to 400' AAE before turning, and must maintain a minimum climb gradient of 200' per NM until established at the minimum en route altitude.

Figure: Standard Departure Profile



As can be seen, the speed 105 MPH is established as V_2. This speed is both the two-engine best-rate climb speed (V_y), and the best-rate single-engine climb speed (V_{yse}). In the event of an obstacle clearance departure, V_2 will be modified by the pilot to reflect the performance needs of the departure—V_2 could then be 90 MPH (the best two-engine best-angle climb speed—V_x), or 80 MPH (the *maximum performance climb speed*—see *Short Field Take-off (25° Flaps)* on p. 7-7 of the *POH*). Any variation from the standard V_2 speed—105-MPH—must be clearly established by the PF in the takeoff briefing. Note also that 120 MPH is assigned as V_3, even though flaps are not used at this point in a normal Seneca departure.[3] During the transition from V_2 to V_3, the airspeed is accelerated from 105 to 120 MPH, and the power is reduced from maximum power to 25"MP[4] and 2500 RPM. To achieve this performance, the transition is marked by a *decrease* in the aircraft pitch-angle from 10° to 5° pitch, approximately.[5]

First Segment Climb (V_r to V_2)—Confined and Non-confined Runways

The *First Segment Climb* is considered the most *critical* phase of a multi-engine departure, especially on short, confined runways—such as the paved runway at Langley Airport. Should an engine failure occur shortly after rotation of Langley Airport, survival will be anchored in pin-point decision-making and quick physical reaction on the part of the PF. The rotation occurs at 80 MPH, yet it is not until 105 MPH (blue-line speed) that the aircraft is established on a safe, predictable climb rate that guards against a sudden engine failure. We have, then, a 25 MPH "gap"—during a normal departures, it lasts only one or two seconds. By comparison, no such gap appears during a departure off a long, non-confined runway—at Abbotsford Airport, for example. When departing from such long runways, we can safely transition to the V_2 and always have the option of landing back on the remaining runway available to us—the takeoff can

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[3] The use of "flap-retraction speed—V_3" is simply to conform with standard phraseology used in the industry.

[4] "Manifold Pressure" in "Inches of Mercury" ("Hg.") units.

[5] Pitch control during this speed and power change is crucial for effective pilot performance, with reference to both the Attitude Indicator and the natural horizon. The 10°- and 5°-marks are simply initial references that can be flown—since the angle of attack will vary with weight and loading, the appropriate pitch settings will have to be adjusted with reference to speed indications. It is certain, though, that a decrease in pitch will have to quickly follow the power reduction that is called for during the V_2—V_3 transition if effective speed control is to be maintained.

simply be rejected, the throttles reduced to idle, and the aircraft returned to the remaining runway surface.

Langley Airport—or any short runway—is a different matter. When departing from Langley Airport, V_2 is typically not achieved until after the aircraft has left the airport perimeter and is crossing—or has just crossed—the roadways that lie of the end of each departure. Obviously, the confined runway departure presents the greater risks, and in an effort to manage the increased risks, the term *decision speed* is used.

Decision Speed (V_1)

The formal definition of decision speed (V_1) is "the speed below which a pilot of a multi-engine aircraft will reject a takeoff in the event of an engine failure, and above which the pilot will continue with the takeoff using the remaining engine(s)." Theoretically, V_1 is the specified speed during a departure ground-run acceleration, above which, the aircraft has achieved sufficient velocity for the control surfaces to become effective in countering the adverse effects of an engine failure. If an engine failure occurs above V_1, the crew continues the takeoff and deals with the failed engine in the air. Should an engine failure occur below V_1, the control surfaces are ineffective in countering adverse effects of an engine failure, and crew must reject the takeoff and bring the aircraft to a stop on the remaining runway. For takeoffs in commuter and airline transport category aircraft, it is required that the distance required to accelerate to V_1, and subsequently reject the takeoff and bring the aircraft to a stop[6]—referred to as Accelerate-stop Distance (ASD)—must always be less than the available distance on a runway—Accelerate-stop Distance Available (ASDA).[7] For transport category aircraft, V_1 calculations tables are published by the aircraft manufacturer, which take into consideration takeoff data such as pressure altitude, temperature, weight and wind conditions—V_1 changes in accordance with variations in these conditions (as do V_r and V_2). For light twin-engined aircraft like the Seneca, however, the publication of a decision speed is not required for certification. Nevertheless, Piper publishes an Accelerate-stop Distance data based on the speed of 80 MPH—that is, they provide data for the distance required to accelerate the aircraft to 80 MPH, and then reject the takeoff and stop under various conditions of pressure altitude, temperature, weight, and wind (see p. 9-6 of the POH). **While V_1 does not exist for the Seneca, the concept of a decision speed can be applied, not only for training purposes, but also an effective tool in dealing with takeoff engine failures during confined runway departures.**

Let us now examine how decision speed will be incorporated into the Standard Operating Procedures. When departing from a confined runway such as is found at Langley Airport, the PF will brief 90 MPH as V_1 decision speed. If the engine failure is below 90 MPH, an automatic rejection of the takeoff must immediately occur. Below 90 MPH we are too close to V_{mc} to risk continuing in the air; the gear will still be down, and onset of drag from the failed engine—assuming the failure is 100%—will suddenly debilitate an effort to gain altitude and increase speed. It is better to take the fence right-side-up at the far end of the runway, rather risk the onset of V_{mc} autorotation only feet above ground obstacles. Conversely, at 90 MPH we are only 3 MPH from the single-engine best-angle climb (V_{xse}), if airspeed is immediately preserved with effective pitch control, and the failed engine managed rapidly and efficiently, the aircraft will accelerate to the blue line and a safe single-engine climb established.

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[6] Specifically, instead of stopping the aircraft, certification actually requires only that the aircraft be slowed to less than 35 knots.

[7] Accelerate-stop Distance Available (ASDA) is defined as the length of the takeoff run available plus the length of any "stopway" where these exist at runway. The "stopway" is a rectangular area on the ground at the end of the runway, in the direction of takeoff, which is prepared as a suitable area in which an aircraft can be stopped in the case of an abandoned takeoff, and is marked over the entire length with yellow chevrons (for discussions regarding stopways, see AIP, AGA 3.6; for an example of published or "declared" distances, see the Aerodrome Chart for Nanaimo Airport in the IFR publication *Canada Air Pilot, CAP 3—British Columbia*).

If the engine failure occurs above 90 MPH but below V_2 (blue line 105 MPH), speed must be conserved by immediately pitching forward—essentially to redirect the thrust from the climb to maximum acceleration—and the actions required to identify and feather the offending engine must be accurate and spontaneous. For all of this to work, the right hand of the PF shall always be on the throttles and at the ready during the First Segment Climb; additionally, the gear must be retracted without delay. Perhaps more importantly, the health of the engines with respect to their ability to develop power must be carefully examined prior to beginning the First Segment Climb, and, therefore, proper and effective monitoring of aircraft and engine performance during the pre-rotation phase of the takeoff is critical. Let us now examine in greater detail how an engine failure during a confined-runway departure will be managed.

Second Segment Climb (V_2)

Second Segment climb performance—which is composed of maximum power and blue line airspeed—continues through to an altitude at which obstacle and terrain clearance is no longer a factor—in all cases, not below 400' AAE. During the Second Segment climb, no power changes should be made. Once the aircraft is safely clear of obstacles and terrain—again, not less than 400' AAE—the Second Segment Climb is completed.

Third Segment Climb (V_3 En route Climb)

To transition to a Third Segment climb, the throttles are retarded to 25"MP and RPM set to 2500. Pitch is decreased—normally from about 10° to 5°—and speed is accelerated to 120 MPH.

Departure Engine Failure

In a departure engine failure, time is of the essence. The PF must be quick and efficient here, and must be absolutely accurate in his or her response. The departure engine failure is the point of greatest risk, and throughout the response to this emergency, the PF must be prepared to pull the power back and treat the twin as if it were a single-engine aircraft with a failed engine. When does the PF retard the throttles to idle and settle the aircraft in a field? The answer is simple: *whenever the airspeed deteriorates and approaches the V_{mc} red line*. When this happens, the game is over and the throttles closed. Of course, the main strategy of the PF is not to get in this position in the first place.

Here, then, is the vital-actions response of the pilot to an engine failure on departure:

In the event of an engine failure below V_1:

Throttle...Idle
Aircraft................Land or Stop Straight Ahead
Control Column.................................Full Back
Brakes..Maximum

In the event of an engine failure above V_1:

Control...................................Direction & V_{mc}
Power..Maximum
Drag .... Retract gear & flaps
Identify ....Dead foot, dead engine
Verify ....Confirm with power
Feather.......................................Dead engine
Fire Check..........................Check dead engine
Emergency Destination .... Select
ATC ....Declare Emergency

Control is crucial in an engine failure during departure! Remember, right after rotation is the danger zone, and it does not end until the blue is maintained and the engine is feathered. So the “control” element which immediately follows an engine failure on departure is pivotal. First, you must be prepared to immediately but smoothly pitch forward—if this is not done, the airspeed will bleed within seconds after the engine quits. How far? Well, until we have the engine feathered, we should target pitching forward until the climb stops and the aircraft is simply maintaining its altitude. Obviously, terrain and obstacles are determining factors, and if terrain is confining, a safe-speed pitch-up attitude may be targeted—but only provided there is no deterioration in the airspeed condition. Avoid too rapidly pitching forward to the point that the aircraft starts to descend, as obviously we must work with the scenario that there is precious little airspace between the aircraft and the ground.

Equally important, you must carefully monitor your airspeed—if there is ever a time to monitor your airspeed with extreme accuracy, this is it! The parameters are quite simple here—if the airspeed eventually bleeds and migrates to the red-line V_{mc}, you have no choice but to power back and treat the twin like a single engine aircraft—make gentle turns to avoid fixed objects as you let the aircraft settle on to the ground.[8] As long as the power is off the maximum setting, the V_{mc} “flip” must occur somewhere below red line speed—the problem is that you cannot predict exactly where this is, given the variables of altitude and aircraft weight.

A third reaction of the pilot which must be considered is keeping the aircraft tracking straight—by keeping straight you will make it far more likely to correctly identify the bad engine in the minimum number of seconds—and remember the seconds count is crucial here. The governing factor is simply this: if you make an effort to keep the track straight during the failure, your feet will be in the best position to help you identify the “dead foot.” If, for example you relinquish all rudder pressure and attempt to control with simple aileron input, things will make far less sense.

There is the chance that the engine failure might be associated with a fire. To guard against the wing melting off, ensure you visually check the nacelle of the bad engine for pealing or discoloured paint, smoke or flames after the engine has been feathered. In the case of an engine fire, the solution is simple: cut-off the source as per the POH.

Ideally advise ATC as soon as practical once you have control of your aircraft and the failed engine has been feathered. ATC can clear all conflicting traffic, and assist in tracking, and even altitude monitoring. You will have to decide if you will return to Langley Airport, if this is you departure point, or head for a vicinity airport with a longer runway and possibly emergency-response services.

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[8] Obviously, the fuel and electrical systems must be safely shut down—the “engine fire” drill, applied to both engines will effectively do this, and then the master switch and magnetos should be selected off.

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Standard Operating Procedures

The PF shall arrive at the airport to allow for sufficient time to complete the pre-flight, cockpit checks, workaround, a crew pre-flight briefing and any other duties that must be preformed. Typically, this will be between 30 minutes and one hour before a booking time.

Pre-flight

Action	SOP Call
Flight Planning ....Compete **Maintenance Status .... Check** In addition to flight preparation activity required by the Canadian Aviation Regulations, the PF shall calculate the following: **Weight and Balance ....Within limits** **Takeoff Distance .... Calculated** **Landing Distance.................................. Calculated** **ASD ....Less than ASDA**	

Cockpit Checks

Action	SOP Call
Fire Extinguisher .... Check/Secure **First-aid Kit .... Check** **Life Jackets (if required)............................... Check** **Flight Supplement....................................... Check** **Journey Log...................Review for Airworthiness** **Pilot Operating Handbook .... Check** **Oxygen Masks (if required).......................... Check** **All Electric Switches ....Off** **Control Locks ....Removed** **Seat Belts not in Use ....Secured** **Circuit Breakers....................................Checked In** **Avionics Master ....Off** **Landing Gear Control .... Down** **Master .... On** **Landing Gear Indictors .... 3 Green** **Fuel Gauges .... Check** **Throttles .... Closed** **Mixtures .... Idle Cut-off** **Fuel Pumps (Individually).. On, pressure check, Off** **Pitot Heat .... On** **Landing, Navigation, Anti-Collision Lights .... On** **Stall Indicator...................... Check Horn and Light**	

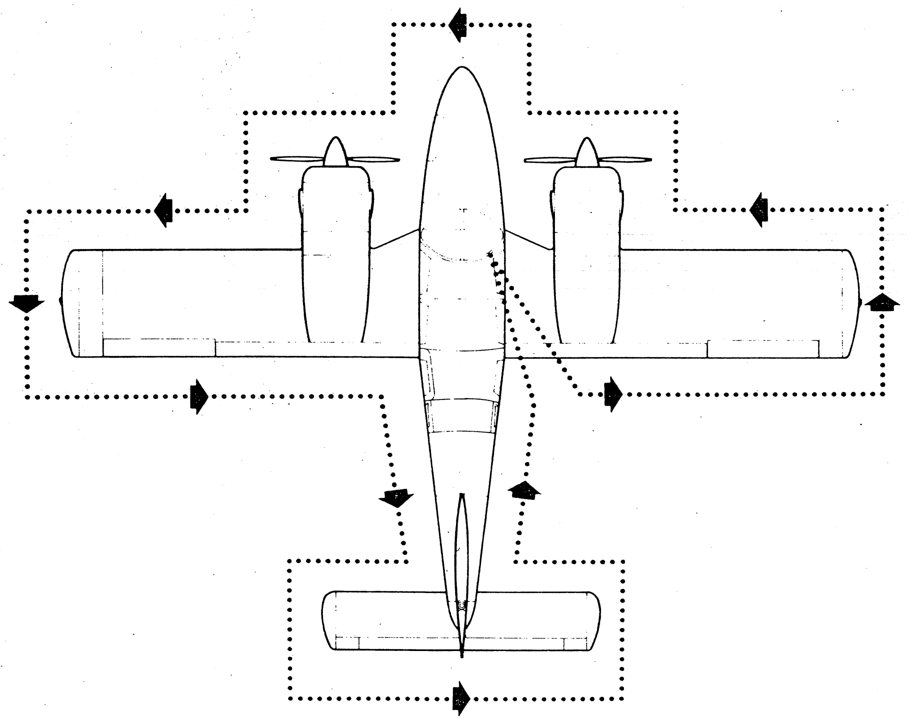
Action	SOP Call
Pitot Mast .... Check Heat **Pitot Heat .... Off** **Landing, Navigation, Anti-Collision Lights .... Off** **Master .... Off**	

Walk-Around

Action	SOP Call
Perform exterior inspection as per the POH 7-2: 1. Fuel Drains (8): two fuel tank drains on each wing, a gascolator drain near the bottom of each nacelle, and two crossfeed drains on the bottom of the fuselage (use Tupperware contain found in nose baggage compartment to catch the fuel. Sump is drain by levers found behind the front passenger seat.) 2. Right wing, aileron and flap—no damage, no ice. Check hinges. 3. Right main gear—no leaks, tires inflated and not excessively worn, 3 ½ inches piston exposed under static load. 4. Right wing tip—no damage. 5. Right leading edge—no damage or ice. 6. Fuel cap—open to check quantity and color of fuel. Check cap vent, and then secure. 7. Right engine nacelle—open doors to inspect engine. Check oil quantity—six to eight quarts; add oil when oil reaches six quarts or below. Secure both inspection doors. 8. Right propeller—no nicks or leaks, spinner secure and not cracked. 9. Nose section—undamaged. 10. Cowl flaps—open and secure. 11. Nose section—undamaged	

Action	SOP Call
12. Nose gear—no leaks, tire inflated and not excessively worn, 2 ½ inches piston exposed under static load, tow bar removed, condition of landing light checked. 13. Forward baggage door—secure and locked. 14. Windshield—clean and secure. 15. Left wing, engine nacelle and landing gear—inspect as completed on the right side. 16. 17. Pitot tube—hole unobstructed, heat checked by feel if need is anticipated. 18. Stall warning vanes—no damage, free movement. 19. Rear door—latched. 20. Left static vent—unobstructed. 21. Dorsal fin air scoop—free of obstruction 22. Empennage—no damage, free of ice, hinges secure. 23. Right static vent—unobstructed. 24. Antennas—secure and undamaged.	

Figure: Walk-Around Chart



Fuel Requirements & Procedures

Action	SOP Call
The minimum fuel requirement for VFR flight is to arrive at the destination with a reserve of 1 hour of fuel at normal cruise power settings. The minimum fuel requirement for IFR flight is to be able fuel to fly to the destination, fly an approach & missed approach, the procedure to a suitable alternate and conduct an approach, then enough fuel to be able to fly for a further 45 minutes at normal cruise power settings, plus any contingency fuel required. Refueling the aircraft with passengers on board is prohibited.	

Ramp & Gate Procedures

Action	SOP Call
The PF is responsible for the safety and security of passengers during movement from the passenger lounge to the aircraft.	

Final Aircraft Inspection

Action	SOP Call
Rear Baggage Door .... Secure **Rear Passenger Door.................................. Secure** **Left Engine Cowling.................................... Secure** **Wheel Chocks ....Removed** **Front Baggage Door .... Secure** **Right Engine Cowling .... Secure**	

Passenger Briefing

Action	SOP Call
The PF must ensure that all passengers are provided with a safety briefing that includes the following information: 1. Where, when, and how carry-on baggage is required to be stowed; 2. the fastening, unfastening, and adjustment of safety belts and their requirement for use during flight; 3. when the seat backs must be secured upright and tables stowed; 4. the location of emergency exits (including instructions to persons sitting next to an exit on how the exit operations); 5. location, purpose, and advisability of reading safety feature cards; 6. the regulatory requirement to obey crew instructions regarding seat belts and no smoking (or the location of fasten seat belts and no smoking signs); 7. the location of emergency equipment such as ELT, fire extinguisher, survival equipment, first aid kit and life raft; 8. the use of passenger-operated portable electronics, the location of fixed passenger-oxygen systems, including the location and presentation of masks, activation of the flow of oxygen, and instruction on how to correctly don and secure the mask (this must include a demonstration) and the priority for persons assisting others; 9. the location and use of life preservers (demonstration required) and instruction on how and when to inflate life preservers.	

Pre-Start

Action	SOP Call
Master .... On **Avionics Master .... On** **Transponder .... Standby** **Transponder Code .... Set** **HSI Slaving .... Test** **ATIS .... Record** **Altimeters .... Set** **Clearance Delivery (if applicable) .... Contact** **Marker Beacon Lights .... Check** **GPS .... Check & Test** **GPS Flight Plan (FPL) .... Set** **Nav/Com #1 .... Test & Set** **ADF .... Test, Set, and Slaved** **Nav/Com #2 .... Test & Set** **Avionics Master .... Off** **Master .... Off**	
Takeoff and Departure Procedures .... Brief[9]	**Runway .... "___"** **Crosswind .... "___"** **Takeoff Procedure: V_r, V_2, V_3 .... "___"** **Departure Procedures .... "___"**[10]
Communications Failure .... Brief VMC/IMC	
Engine Failure Procedures .... Brief	In the event of an engine failure below V_1: **Throttle .... Idle** **Aircraft .... Land or Stop Straight Ahead** **Control Column .... Full Back** **Brakes .... Maximum** In the event of an engine failure above V_1: **Control .... Direction & V_{mc}** **Power .... Maximum** **Drag .... Retract gear & flaps** **Identify .... Dead foot, dead engine** **Verify .... Confirm with power** **Feather .... Dead engine** **Fire Check .... Check dead engine** **Emergency Destination .... Select** **ATC .... Declare Emergency**

[9] The PF shall conduct a Takeoff Briefing (TOB) prior to every departure. At the discretion of the PF, the TOB may be conducted just prior to boarding, prior to engine start-up, or during taxi, but it must be conducted prior to the request for takeoff clearance.

[10] Reference to a "standard" departure implies the *Standard Departure Profile* outline in the Appendix.

Action	SOP Call
Forward Baggage Door .... Secure **Oxygen.. On or Off** **Passengers... Brief** **Brake Handle .... On** **Cowl Flaps... Open** **Fuel Selectors....................LEFT X-feed—RIGHT On**	

Engine Starts

Cold Engine Start	
Action	**SOP Call**
Hobbs & Time..Record	
	Call for **COLD ENGINE START CHECKLIST**
Brake Handle .... On Both engines: **Mixtures .... Idle Cut-off** **Master .... On** **Throttles .... Closed** **Propellers ....Forward** **Magnetos... On** **Alternators .... On**	
Left Engine ONLY **Fuel Pump .... On** **Mixture... Set Rich** **Throttle...Advance 75%** **Fuel Flow ....Stabilized for 3 Seconds** **Throttle.. Closed** **Mixture.. Closed**	
Propeller...Clear	Call **CLEAR FOR ENGINE STARTS** out pilot storm window
	State: **STARTING LEFT ENGINE**
Starter ....Engage Left As engine starts: **Mixture............................Advance at engine start** After engine starts: **Oil Pressure...................................Above red line** **Throttle...800 RPM** **Fuel Pump..Off** **Fuel Pressure .... Check**	
	Call for **AFTER ENGINE START CHECKLIST**
Review & confirm actions of **AFTER ENGINE START CHECKLIST** are complete	Call **AFTER ENGINE START CHECKLIST COMPLETE**
Right Engine ONLY **Fuel Pump .... On** **Mixture... Set Rich** **Throttle...Advance 75%** **Fuel Flow ....Stabilized for 3 Seconds** **Throttle.. Closed** **Mixture.. Closed** **Propeller...Clear**	

Action	SOP Call
	State: **STARTING RIGHT ENGINE**
Starter .... Engage Right As engine starts: **Mixture............................Advance at engine start** After engine starts: **Oil Pressure...................................Above red line** **Throttle..800 RPM** **Fuel Pump..Off** **Fuel Pressure .... Check**	
	Call for **AFTER ENGINE START CHECKLIST**
Review & confirm actions of **AFTER ENGINE START CHECKLIST** are complete	Call **AFTER ENGINE START CHECKLIST COMPLETE**
	Call **COLD ENGINE START CHECKLIST COMPLETE**

Hot Engine Start

Action	SOP Call
	Call for **HOT ENGINE START CHECKLIST**
Brake Handle .... On Both Engines **Mixtures .... Idle Cut-off** **Master .... On** **Throttles .... ¼" Open** **Propellers ....Forward** **Magnetos.. On** **Alternators .... On**	
	Call **CLEAR FOR ENGINE STARTS** out pilot storm window
	State: **STARTING LEFT ENGINE**
Starter ....Engage Left As engine starts: **Mixture............................Advance at engine start** After engine starts: **Oil Pressure...................................Above red line** **Throttle..800 RPM** **Fuel Pump..Off** **Fuel Pressure .... Check**	
	Call for **AFTER ENGINE START CHECKLIST**

Action	SOP Call
Review & confirm actions of **AFTER ENGINE START CHECKLIST** are complete	Call **AFTER ENGINE START CHECKLIST COMPLETE**
	State: **STARTING RIGHT ENGINE**
Starter .... Engage Right As engine starts: **Mixture............................Advance at engine start** After engine starts: **Oil Pressure...................................Above red line** **Throttle..800 RPM** **Fuel Pump...Off** **Fuel Pressure .... Check**	
	Call for **AFTER ENGINE START CHECKLIST**
Review & confirm actions of **AFTER ENGINE START CHECKLIST** are complete	Call **AFTER ENGINE START CHECKLIST COMPLETE**
	Call **HOT ENGINE START CHECKLIST COMPLETE**

Flooded Engine Start

Action	SOP Call
	Call for **FLOODED ENGINE START CHECKLIST**
Brake Handle .... On Both Engines **Fuel Pumps ....Off** **Mixtures .... Idle Cut-off** **Propellers ....Forward** **Master .... On** **Magnetos.. On** **Alternators .... On**	
	Call **CLEAR FOR ENGINE STARTS** out pilot storm window
	State: **STARTING LEFT ENGINE**
Left Engine ONLY **Throttle..Full Open** **Propeller...Clear** **Starter ....Engage Left** As engine starts: **Throttle..Retard Rapidly** **Mixture.. Advance Slowly**	

Action	SOP Call
After engine starts: **Oil Pressure.. Check** **Throttle..800 RPM** **Fuel Pressure .... Check**	
	Call for **AFTER ENGINE START CHECKLIST**
Review & confirm actions of **AFTER ENGINE START CHECKLIST** are complete	Call **AFTER ENGINE START CHECKLIST COMPLETE**
	State: **STARTING RIGHT ENGINE**
Right Engine ONLY **Throttle...Full Open**	
Propeller...Clear	
Starter .... Engage Right As engine starts: **Throttle...Retard Rapidly** **Mixture....................................... Advance Slowly** After engine starts: **Oil Pressure.. Check** **Throttle..800 RPM** **Fuel Pressure .... Check**	
	Call for **AFTER ENGINE START CHECKLIST**
Review & confirm actions of **AFTER ENGINE START CHECKLIST** are complete	Call **AFTER ENGINE START CHECKLIST COMPLETE**
	Call **HOT ENGINE START CHECKLIST COMPLETE**

Taxi

Action	SOP Call
Avionics Master .... On **Fuel Selectors....................RIGHT X-feed—LEFT On** **Taxi Clearance...........................Obtain if required**	
Wing Clearance .... Check	Call **LEFT WING CLEAR, RIGHT WING CLEAR**
Brakes...Release & Check **Instruments .... Check**	As turn coordinator responds in a turn call **RIGHT/LEFT WING DOWN, BALL LEFT/RIGHT**. If the attitude indicator stay steady in a turn call **STEADY**. Confirm that the compass is free by stating **COMPASS FREE AND FLOATING**.

Pre-Takeoff

Action	SOP Call
	Call for **RUNUP CHECKLIST**
Throttles ....1000 RPM **Propeller Blast Area .... Check Clear** **Propeller Blades...............Clear of Water or Debris** **Brakes..Set**	
GPS .... Set NAV 4 **GPS .... Set Moving Map Range** **GPS ....Set/confirm Active Waypoint** **GPS ....Set OBS or LEG mode** **GPS .... Altimeter and Altitude (ALT) Set** **GPS ....Load Approach (if applicable)** **GPS ....RAIM Approach** **GPS .... Set NAV 4**	

Action	SOP Call
Trim .... Set **Electric Trim .... Test** **Vacuum .... Check 5"Hg ±1"** **Landing and Navigation Lights .... On** **Alternators .... Check** **Landing and Navigation Lights .... Off** **Pitot Heat .... Check load draw** **Fuel Sectors .... RIGHT & LEFT On** **Mixtures .... Full Rich** **Throttles .... 2000 RPM** **Magnetos .... Check**[11]	
Oil Temperatures and Pressures .... Check **Propellers (Individually) .... 3 Cycles of 300 RPM** **Propellers .... Reduce to 1900 RPM** **Throttles .... Increase 1"Hg** **RPMs .... Check 1900** **Throttles .... Decrease 1"Hg;** **Propellers .... Set 2000 RPM.** **Mixtures .... Check Flow** **Throttles .... Set 1500RPM** **Propellers (Individually) .... Feather Check**[12] **Throttles .... Close** **Oil Pressure .... Check** **Throttles .... 1000 RPM**	
	Call **RUNUP CHECKLIST COMPLETE**

[11] Maximum Drop 175 RPM; maximum difference 50 RPM.

[12] RPM must drop to 1000 RPM in 1 to 3 seconds—slower feathering indicates inadequate dome pressure.

Action	SOP Call
	Call for **PRE-TAKEOFF CHECKLIST**
Magnetos.. Both **Auto Pilot..All Off** **Fuel Supply ....Sufficient** **Engine Gauges .... Check** **Flight Instrument ....Set and Checked** **Fuel Selectors.. On** **Turbochargers..Off** **Mixtures ....Full Rich** **Propellers .... Full Forward** **Harness/Hatches/Seat .... Check and Secure** **Control Column.....................Free and Correct** **Time..Record**	
	Call **PRE-TAKEOFF CHECKLIST COMPLETE**

Runway

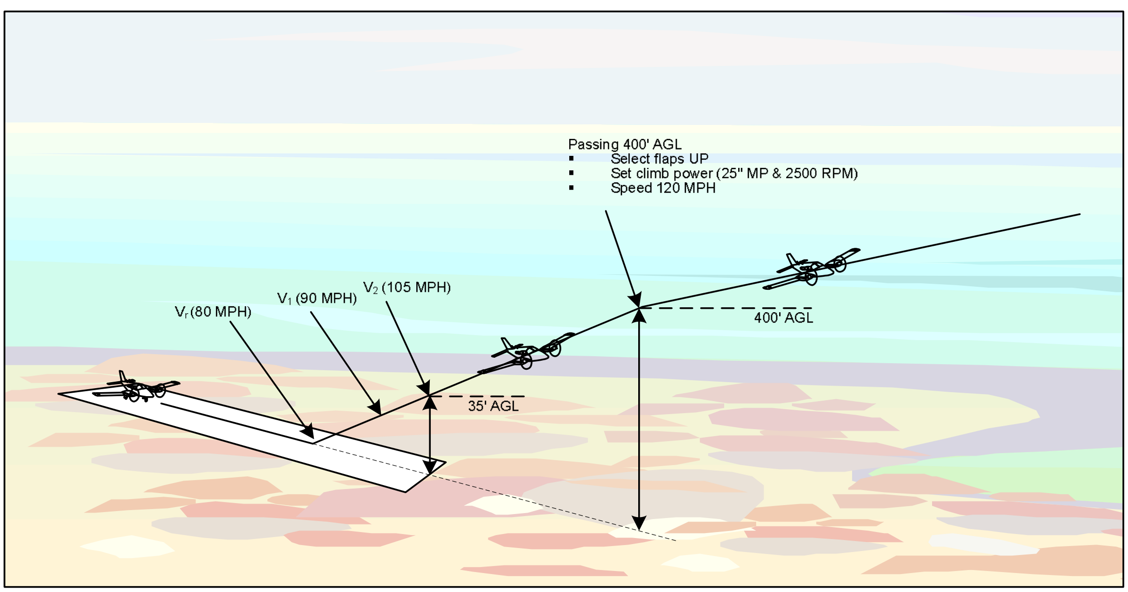
Action	SOP Call
Obtain takeoff clearance with a short delay[13].	Prior to entering or crossing a runway, in addition to obtain required clearances visually clear and call **CLEAR LEFT, CLEAR RIGHT**
	Call for **RUNWAY CHECKLIST**
Anti-collision Lights..................................ON **Pitot Heat (IFR) ....ON** **Fuel Pumps ....ON** **Transponder .... Set ALT**	
	Call **RUNWAY CHECKLIST COMPLETE**
In position, check HSI Heading Bug aligned with Runway Heading. When "Cleared for Takeoff," turn the landing and taxi lights **ON**.	

[13] The delay is required owing to the short length of the runway and the limited opportunity to properly check engine performance prior to takeoff.

Normal Takeoff

Action	SOP Call
	Call for **TAKEOFF CHECKLIST**
Landing Lights ....ON **Power ....Set 2000 RPM**	
Engine Gauges ....Confirm Green	Call **LEFT ENGINE GREEN, RIGHT ENGINE GREEN** Call **MAXIMUM POWER**
Brakes ....Release **Throttles ....Set Maximum Power**	
Power Gauges ....Check Equal	Call **NO SPLIT NEEDLES**
ASI .... Confirm Increasing Airspeed	Call **AIRSPEED ALIVE**
ASI .... 80 MPH	At V_r call **ROTATION**
VSI ....Confirm Positive Rate **Gear .... UP**	Call **POSITIVE RATE, GEAR UP**
ASI .... 105 MPH	Call $\mathbf{V_2}$
At 400' AAE: **ASI ....Accelerate to V_3** **Manifold Pressure.................... Set 25"** **RPM ....Set 2500 RPM** **Flaps .... Retract**	Call **105 FOR 120, CLIMB POWER SET**

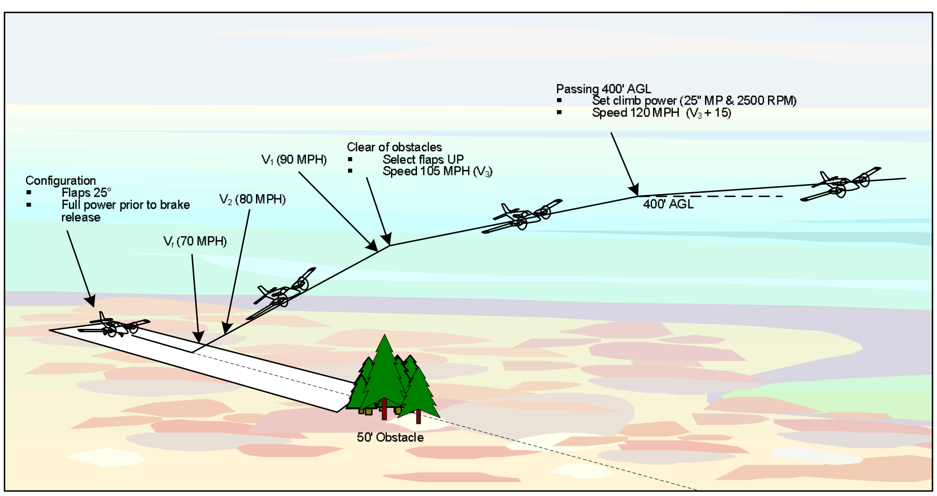
Figure: Standard Departure Profile



Obstacle Takeoff

Action	SOP Call
	Call for **TAKEOFF CHECKLIST**
Landing Lights ....ON **Power ....Set 2000 RPM**	
Engine Gauges ....Confirm Green	Call **LEFT ENGINE GREEN, RIGHT ENGINE GREEN** Call **MAXIMUM POWER**
Throttles ....Set Maximum Power	
Power Gauges........Check Equal **Brakes........Release**	Call **NO SPLIT NEEDLES**
ASI .... Confirm Increasing Airspeed	Call **AIRSPEED ALIVE**
ASI .... 70 MPH	At V_r call **ROTATION**
VSI ....Confirm Positive Rate **Gear........ UP**	Call **POSITIVE RATE, GEAR UP**
ASI .... 80 MPH	Call $\mathbf{V_2}$
Clear of obstacles: **Flaps ....Set 0°**	Call **FLAPS 0**
ASI ....Accelerate to 105 MPH	Call $\mathbf{V_3}$
At 400’ AAE: **ASI .... Accelerate to V_3 + 15** **Manifold Pressure........ Set 25”** **RPM........Set 2500 RPM** **Flaps ....Confirm Retracted**	Call **105 FOR 120, CLIMB POWER SET**

Figure: Obstacle Departure Profile



Climb

Action	SOP Call
Perform **AFTER TAKEOFF CHECKLIST** passing through 1000' AAE: **Landing Lights .... OFF** **Fuel Pumps .... OFF Individually** **Engine Gauges .... Confirm Green**	Call **AFTER TAKEOFF CHECKLIST COMPLETE**
	Call **500' TO GO** when approaching cruising altitude

Cruise

Action	SOP Call
Perform LEVEL/CRUISE CHECKLIST once level: **Throttles ....Set** **Propellers ....Set** **Mixture ....Set** **Cowl Flaps... Close** **EGT .... Check** **Mixtures .... Adjust as required**	
	Call **LEVEL/CRUISE CHECKLIST COMPLETE**

Descent

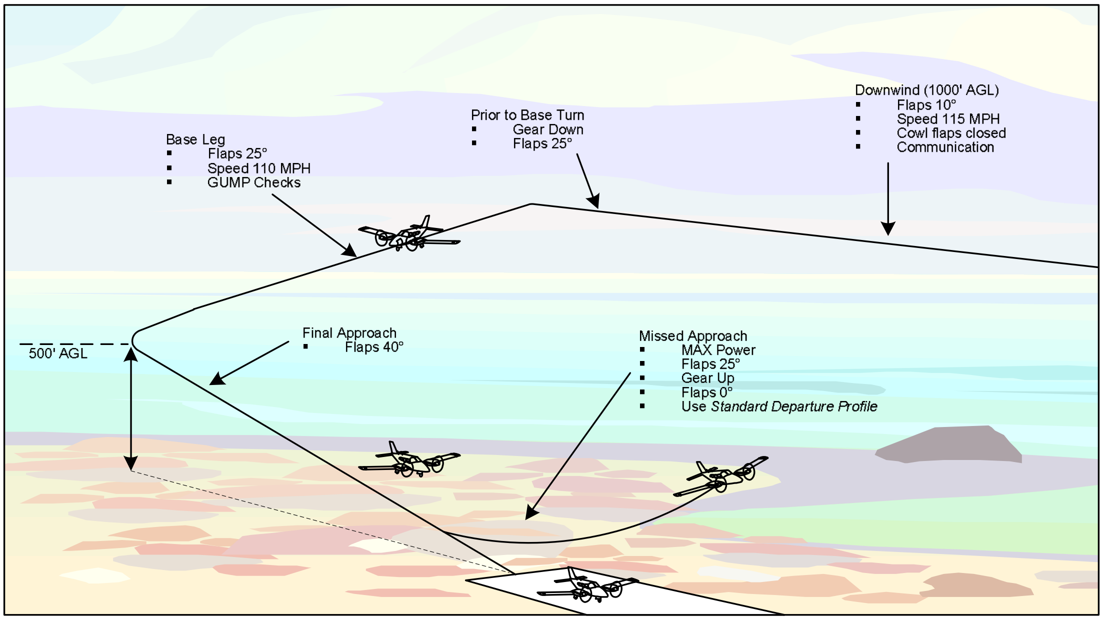
Action	SOP Call
Obtain ATIS Conduct clearing turns Start descent Maintain the following proximity speeds: Within 3nm of aerodrome ....120 MPH Downwind Leg.................. 115 MPH & 10° Flaps Base Leg .... 110 MPH & 25° Flaps Final Approach.................... 90 MPH & 40° Flaps	
	Prior to descent below 1000' AAE, call for **PRE-LANDING CHECKLIST**
Seat backs..Erect **Seat belts.. Secure** **Fuel Selectors.. On** **Landing Light... On** **Fuel Pumps .... On** **Auto Pilot...Off** **Brakes.. Checked**	
Approach ....Briefed[14]	**Wind Conditions .... Anticipated/ATIS** **V_{ref} .... 90 MPH** **Flap Configuration .... Flaps 40**
	Call **PRE-LANDING CHECKLIST COMPLETE**

[14] The approach briefing will give specific reference to anticipated wind conditions, V_{ref}, and flap configuration.

Final Approach & Landing

Action	SOP Call
Below 1000' AAE during an approach or departure the cockpit will be *STERILE*. Conversations and actions among crew will only pertain to the landing actions and sequences. Prior to descent below 500' AAE complete GUMP CHECKS: **Gas........................... Fuel pumps and Selectors On** **Undercarriage.............3 Green, One in the Mirror** **Mixtures .... Full Forward** **Propellers .... Full Forward**	Call **GUMP CHECKS COMPLETE**
Prior to descending below 400' AAE during a final landing approach, the following conditions for a stabilized approach must be established and maintained: 1. the airspeed is constant at V_{ref} in the final landing flap configuration; 2. the glideslope is normal and steady; 3. the runway centerline is accurately tracked. If the above conditions are not established, the PF shall conduct a missed approach.	
After touchdown: **Flaps ....Immediately Retracted** **Brakes......................................Maximum Braking**	

Figure: Standard Visual Approach Profile



Missed Approach

Action	SOP Call
	Call **MISSED APPROACH**
Power ....Set Maximum	Call **MAX POWER SET**
VSI ....Confirm Positive Rate **Gear.. UP**	Call **POSITIVE RATE, GEAR UP**
ASI .... V_2	Call **V_2**
At 400' AAE: **ASI ....Accelerate to V_3** **Manifold Pressure.................................... Set 25"** **RPM..Set 2500 RPM** **Flaps .... Retract**	**Call 105 for 120, CLIMB POWER SET**

Stabilized Approach

Action	SOP Call
During the Final Approach and Landing phase, a stabilized approach is to be flown. The aircraft must be stabilized by 500' AAE in VMC and 1000' AAE in IMC. Criteria for a stabilized approach is as follows: 1. The aircraft is in the landing configuration 2. The aircraft is established on the approach profile 3. Indicated airspeed is within +10 KTS to –5 KTS of target airspeed 4. Power is managed to maintain the target airspeed In the event that this is not achieved, the PIC shall conduct a missed approach.	Call **DESTABILIZED APPROACH, GOING-AROUND**

Non-Normal Standard Operating Procedures

General

There are a host of emergencies that can potentially surface during the course of a flight. The key to any emergency is the age old saying: aviate, navigate, communicate. It is imperative that control of the aircraft is established and maintained prior to any efforts to identify the problem. Obliviously, there are situations where control and problem identification are essentially simultaneous.

Rejected Takeoff

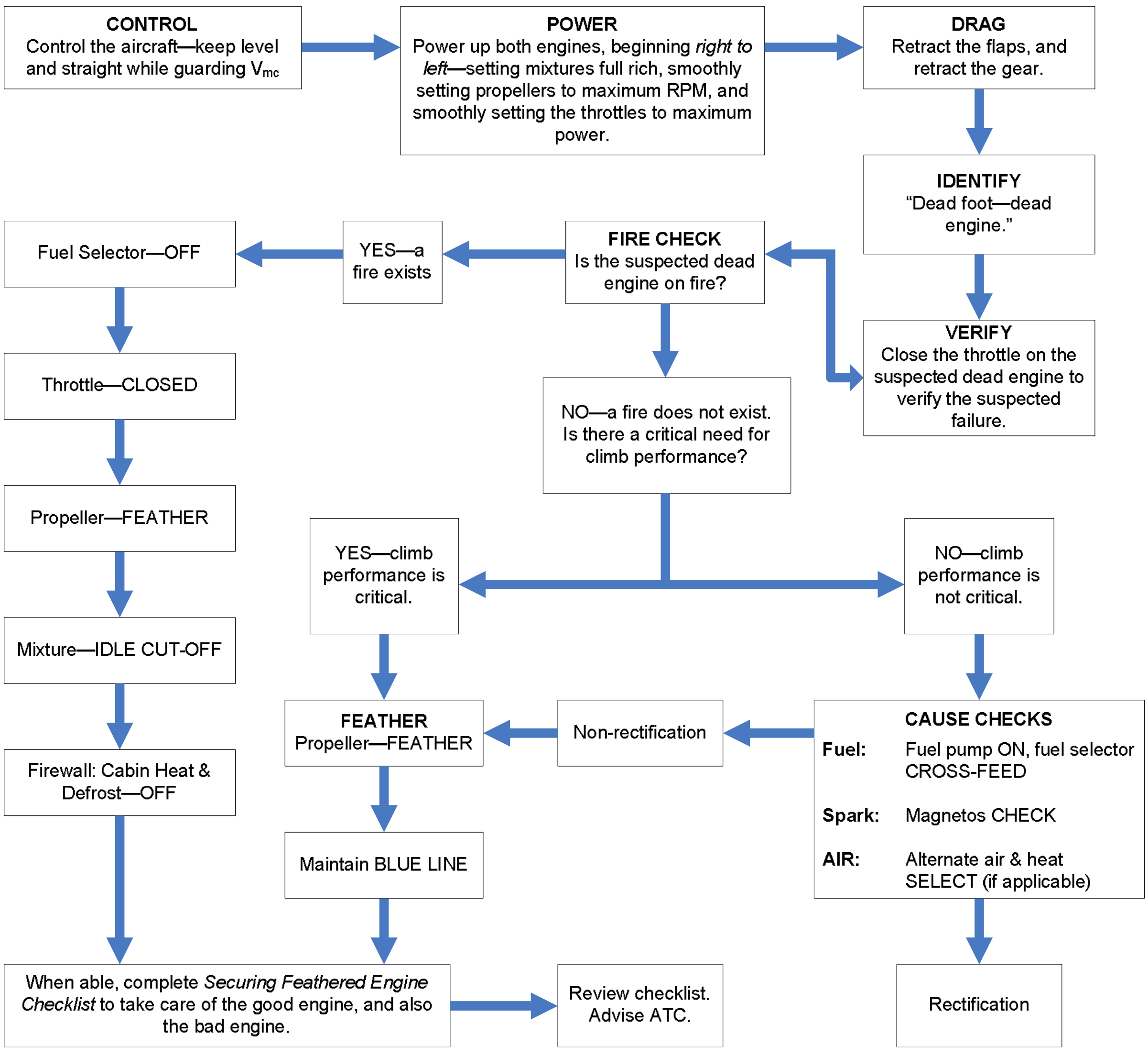
Action	SOP Call
	When an unsafe or non-normal situation requiring a rejected takeoff is identified by a member of the crew, the PIC shall call **REJECT, REJECT**
Throttles .... Closed **Flaps .... Retract** **Brakes....................Apply for Maximum Braking**	
Communication .... Advice ATC	Do not identify problem to ATC at this time
Maintain constant brake pressure, avoiding skidding, until aircraft stops. An illusion can occur under heavy braking such that the aircraft appears to be stopping quicker than it actually is, causing the brakes to be released prematurely.	
ONCE AIRCRAFT IS STOPPED Evaluate situation using all resources available—i.e., ATC, cockpit indications, AFF, visual inspection—prior to initiating passenger evacuation. Remain on active runway to allow AFF full access to aircraft. Determine if taxiing off the runway or a shut-down is required. Notify ATC of problem and intentions.	

Engine Failure

This condition is recognized by a loss of all thrust from an engine, as indicated by the engine gauges, asymmetric thrust, and/or airframe vibrations with abnormal or normal engine gauges. When conditions permit, conduct an evaluation of causes prior to feathering. It is recommended that the causes ***not be investigated***, and the propeller immediately feathered when the aircraft is less that 1000' AGL or climb performance is required. See the *ENGINE FAILURE FLOW CHART* for more detail.

Action	SOP Call
Control............................ Rudder, Ailerons & Pitch	
Mixtures ....Full Rich **Propellers .... Full Forward** **Throttles ....Max Power**	Call **MAX POWER**
Flaps .... Retract **Gear.. Retract**	Call **FLAPS UP** Call **GEAR UP**
Identify Dead Engine.......................... "Dead Foot" **Verify Dead Engine ....Close Throttle** **Fire Check .... Dead Engine** **If a fire exists**, proceed *immediately* to ENGINE FIRE drill and SOPs. **If a fire does not exist**, continue with this SOP.	
If time permits: Fuel, Spark Air. **Fuel Pump.. On** **Fuel Selector .... Crossfeed** **Magnetos.. Check** **Alternate Air .... Select** **Alternate Heat .... Select**	 Call **FUEL** Call **SPARK** Call **AIR**
If still not rectified: **Dead Engine Propeller...........................Feather** **Speed.................Maintain Blue Line (105 MPH)**	 Call **FEATHERING LEFT/RIGHT ENGINE**
Operating Engine **Throttle .... Set as required** **Propeller.............................. Set as required** **Mixture................................ Set as required** **Oil Temperature .... Check** **Cowl Flaps .... Set as required** **Feathered Engine** **Magnetos ....Off** **Fuel Pump ....Off** **Alternator ....Off** **Fuel Selector...Off** **Alternator Load.. Check** **Electrical Load.........................Reduce as Required**	

Figure: Engine Failure Flow Chart



Engine Fire

Action	SOP Call
	Call **FIRE LEFT/RIGHT ENGINE**
Fuel selector .... Off **Throttle .... Close** **Propeller .... Feather** **Mixture .... Idle cut-off** **Firewall .... Closed**[15]	Call **FEATHERING LEFT/RIGHT ENGINE**
Control .... Rudder, Ailerons & Pitch	
On operating engine: **Mixtures .... Full Rich** **Propellers .... Full Forward** **Throttles .... Max Power**	Call **MAX POWER**
Flaps .... Retract **Gear .... Retract** **Speed .... Maintain Blue Line (105 MPH)**	Call **FLAPS UP** Call **GEAR UP**
Operating Engine **Throttle .... Set as required** **Propeller .... Set as required** **Mixture .... Set as required** **Oil Temperature .... Check** **Cowl Flaps .... Set as required** **Feathered Engine** **Magnetos .... Off** **Fuel Pump .... Off** **Alternator .... Off** **Fuel Selector .... Off** **Alternator Load .... Check** **Electrical Load .... Reduce as Required**	

[15] Heater/defroster off.

Passenger Evacuation

Action	SOP Call
	Call **PASSENGER EVACUATION**
Parking Brake.. On **Throttles .... Close** **Mixtures .... Idle Cut-off** **Magnetos..Off** **Master ....Off**	Call **ENGINE SHUTDOWN**
	Call **EVACUATE, EVACUATE**
Fire Extinguisher ....Obtain **Passengers..............................Assist in Evacuation**	

IFR Standard Operating Procedures

Hold

Action	SOP Call
Nav Aid ....Tune, Identify, Test, Set	
Upon reaching the Nav Aid: **Time.. Start** **Turn .... Entry Heading as per POD** **Throttle..Set** **Talk.........................Advice ATC Entering the Hold**	

ILS Approach

The following SOP revolves around an ILS approach. However, the flow, format and standard calls can be applied to other precision and non-precision approaches. It is also important to note that when below 1000' AAE during an approach or departure, conversation and actions among crew will only pertain to the landing actions and sequences.

Action	SOP Call
Speed **Flaps ....Set 10°** **Throttles .... Set 16" MP** **Nav Aids...........................Tune, Identify, Test, Set** **HSI ....Confirm GPS or NAV** **ATIS..Obtain**	
Approach .... Brief	**Approach and runway number .... "___"** **Airport name .... "___"** **Chart page number...................................... "___"** **Chart date/effective date .... "___"** **Final approach course, Freq & Ident .... "___"** **Procedure turn altitude .... "___"** **Final approach altitude to FAF .... "___"** **Glideslope altitude at FAF............................ "___"** **Decision height altitude............................... "___"** **Missed approach altitude and track............. "___"**

Action	SOP Call
	Call for **PRE-LANDING CHECKLIST**
Seat backs........ Erect **Seat belts........ Secure** **Fuel Selectors........ On** **Landing Light........ On** **Fuel Pumps........ On** **Auto Pilot........ Off** **Altimeter........ Set** **Brakes........ Checked** **Approach........ Briefed**[16]	Call **ALTIMETER SET "XX.xx"**
	Call **PRE-LANDING CHECKLIST COMPLETE**
Localizer........ Movement Detected **Localizer........ Capture** **Glideslope........ Movement Detected** **Glideslope........ Capture**	Call **LOCALIZER ALIVE** Call **LOCALIZER CAPTURE** Call **GLIDESLOPE ALIVE** Call **GLIDESLOPE CAPTURE** Call **GEAR DOWN, FLAPS 25°**
Gear........ Down **Flaps........ 25°** **Throttles........ As Required**	
Crossing FAF........ Glidepath Check	Call **FINAL APPROACH FIX, "___" (Charted altitude of FAF)**
Timer........ Start **Gear........ Confirm Down** **Power........ Adjust as Required** **Tower........ Report Beacon Inbound**	
Gas........ Fuel pumps and Selectors On **Undercarriage........ 3 Green, One in the Mirror** **Mixtures........ Full Forward** **Propellers........ Full Forward**	
Altitude........ 100' Above Minimums **Altitude........ Minimums**	Call **100' ABOVE** Call: **MINIMUMS, NO CONTACT**; or **MINIMUMS, LIGHTS ONLY**; or **MINIMUMS, RUNWAY IN SIGHT** Then call: **LANDING** or **GO-AROUND**
Flaps........ Full if Required	

[16] Procedures, Runway, Winds, $V_{ref.}$

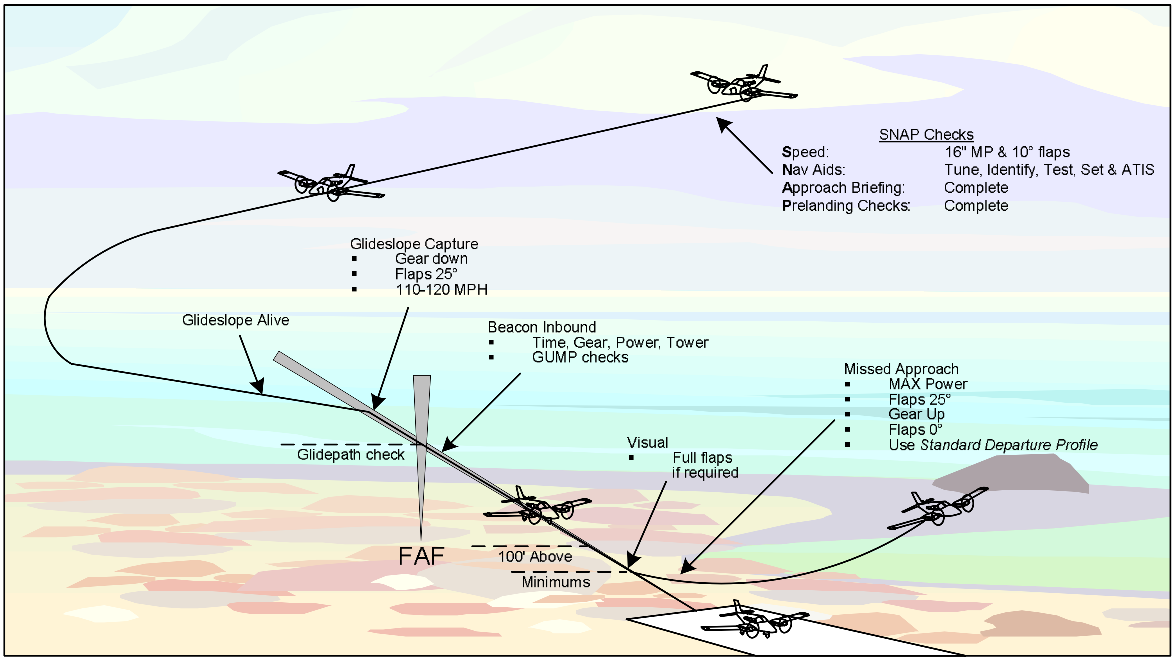
Missed Approach

Action	SOP Call
	Call **MISSED APPROACH**
Power ....Set Maximum	Call **MAX POWER SET**
VSI ....Confirm Positive Rate **Gear.. UP**	Call **POSITIVE RATE, GEAR UP**
ASI .... V_2	Call **V_2**
Follow published IFR missed approach procedure or other ATC clearance as applicable.	
At 400' AAE: **ASI ....Accelerate to V_3** **Manifold Pressure................................... Set 25"** **RPM...Set 2500 RPM** **Flaps .... Retract**	**Call 105 for 120, CLIMB POWER SET**

Stabilized Approach

Action	SOP Call
During the Final Approach and Landing phase, a stabilized approach is to be flown. The aircraft must be stabilized by 500' AAE in VMC and 1000' AAE in IMC. Criteria for a stabilized approach is as follows: 5. The aircraft is in the landing configuration 6. The aircraft is established on the approach profile 7. Indicated airspeed is within +10 KTS to –5 KTS of target airspeed 8. Power is managed to maintain the target airspeed In the event that this is not achieved, the PIC shall conduct a missed approach.	Call **DESTABILIZED APPROACH, GOING-AROUND**

Figure: Standard IFR Approach Profile



Appendices

Appendix: Standard Calls

Airspeed and Flap Changes

The PF will verbalize the appropriate extension speed and any change in flap or gear settings (i.e. **160 MPH—FLAPS 10, 140 MPH—FLAPS 25** or **FLAPS CLEAN**, **150 MPH—GEAR DOWN** etc.) and changes in the airspeed being targeted (i.e. **110 FOR 90)**.

Altitude Clearances and Deviations

The PF shall call the altitude leaving and the target altitude—i.e. **LEAVING 2000' FOR 3000'**. The PF will also call 2**00' TO GO**, when 200' away from the targeted altitude.

Radio Navigation Settings

ADF:
NUMBER 1 ADF IDENTIFIED ON ________ (NDB identifier)
VOR:
NUMBER 2 VOR IDENTIFIED ON ________ (VOR identifier), TRACK SET _____ (degrees)
ILS:
NUMBER 1 VOR IDENTIFIED ON ILS ________ (runway number), TRACK SET _____ (final approach course)

Checklist Interruptions

If a checklist is interrupted, the following calls shall be made:

HOLD CHECKLIST AT "*ITEM*".
RESUME CHECKLIST AT "*ITEM*".

Transfer of Controls

A transfer of controls between the student and instruct will take the following format:

Instructor: **I HAVE CONTROL** Student: **YOU HAVE CONTROL**	or	Instructor: **YOU HAVE CONTROL** Student: **I HAVE CONTROL**

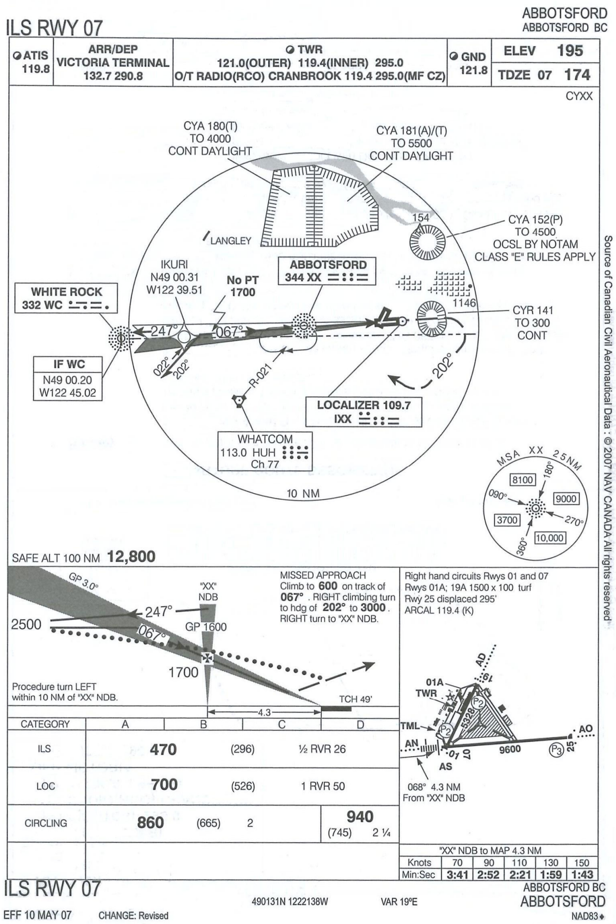
ATC Communications

All ATC clearances or instructions shall be read back in full.

Autopilot Operations

Engagement: **AUTOPILOT ON**
Disengagement**: AUTOPILOT OFF**

Appendix: Standard Approach Plate Briefing



Components of an Approach Plate Briefing

1. Approach and runway number
2. Airport name
3. Chart page number
4. Chart date/effective date
5. 100nm Safe Altitude (if required)
6. Minimum Sector Altitude (if required)
7. Transition procedures (if applicable)
8. Final approach course, frequency and identifier
9. Procedure turn altitude
10. Final approach altitude to FAF
11. Glideslope altitude at FAF
12. Decision height altitude
13. Touchdown and airport elevations
14. Missed approach altitude and track

Sample Approach Plate Briefing 1

"Today we are doing the ILS Runway 07 Abbotsford. Page 15; effective May 10, 2007. Minimum Sector Altitude of 3700'. Final approach course 067° on 109.7 IXX. Procedure Turn 2500'; crossing the FAF XX frequency 344 at 1600'; down to ILS minimums 470'. I will call "100' TO GO". The touchdown zone is at 174' and the airport elevation is 195'. In the event of a missed approach, I will climb to 600' on a track of 067°, then a right climbing turn to a heading of 202° to 3000', then a right turn to "XX" NDB. Any questions?"

Sample Approach Plate Briefing 2

"This is the ILS 07 at Abbotsford Airport. The tower frequency is 119.4. Navigation required: ILS frequency 109.7—tuned, identified, and set. Abbotsford NDB frequency 344—tuned, identified, test, and set. We are being vectored south of the airport and our final approach course is 067. Our 100nm safe altitude is 12800' and our sector altitude is 10000'. There are no cautionary notes for this airport. The glideslope altitude crossing the NDB will be 1600', the decision height will be 470', and I will call 100 above minimums. The airport elevation is 195' with our touchdown zone at 174'. Our back-up time for the decision height is 2 minutes 36 seconds at 100 KNOTS. In the event of a missed approach, we shall climb to 600' on a track of 067°, then a right climbing turn to a heading of 202° up to 3000'. At 3000' we'll make a right turn to the Abbotsford NDB for the published hold. Approach Plate Briefing complete. Any questions?"