CAVOK Aviation Training Ltd.

PIPER PA-34-200 Seneca I.

and

FNPT II MEP STANDARD OPERATIONAL PROCEDURES

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Notes:
-These SOP's and Checklists were developed for PIPER PA-34-200 Seneca I. and FNPT II MEP training.
This SOP is written in accordance with the Piper PA34-200 Pilot's Operating Manual (POM) and CAVOK Aviation Training Ltd. IFR Procedures.
Approved aircraft manuals always take precedence over this training manual.
-Take-off only with flaps 0 -Operation in IFR only approved on 1200 m paved runway or longer.
-Normal procedures shall be completed by memory as a „flow" followed by reading the appropriate normal checklist. Normal checklists can be found in laminated form on board. Additionally, AFTER TAKEOFF, APPROACH, LANDING normal checklists are placed on the instrument panel as well.
-During emergency situations non-normal checklists shall be completed when aircraft and flight path is under positive control and above minimum sector altitude. It is permissible to read non-normal checklists below MSA only when the aircraft is under radar vectors or PIC can maintain positive visual contact with the ground.
-When emergency situation requires imminent action pilots shall complete non- normal checklist by memory. These checklists are: ENGINE FAILURE (FEATHERING PROCEDURE), ENGINE FIRE, PROPELLER OVERSPEED.
Memory items regarding one-engine operation finish when affected engine's mixture is IDLE CUTOFF, aircraft is trimmed and 5 degrees bank toward operating engine is established.
-In the following procedure „CHECK" means item is checked according to the Pilot's Operating Manual.
-When „As required" is indicated in the checklist corresponding item or system status should be called out.
-Comply with the engine leaning procedure according to PA-34-200 POM

CAVOK Operational Limitations

Engine failure training :

Below 2500 ft AGL simulation of engine failure approved by a power reduction only. **The allowed minimum altitude for engine failure training simulated by power reduction is 500 ft AAL.**

Actual engine shutdown for training purposes allowed at or above 2500 ft AGL only. This exercise shall be carried out near a suitable aerodrome, so that a safe single engine landing can be carried out in case of an unsuccessful restart.

NORMAL PROCEDURES

Preflight Procedures:

Action		Call
-Weather	Check	
-NOTAMs	Check	
-Aircraft status	Check	
-Crew documents	Check	
-Flight plan	Create and file	
-Minimum Block fuel	Calculate	
-W and B	Check	
-ASDR, TODR, Decision point	Calculate	

Walk-around inspection procedure:

Note: Before every first take-off a day or after crew change a walk-around inspection should be completed.

Action	Call
Entering the Cockpit:	
-Control lock (if installed) Remove	
-Landing gear position Down	
-Circuit breakers Check in	
-Ignition switches (magnetos) Off	
-Panel switches Off	
-Alternators Off	
-Instrument master switch and Avionics Off	
-Master switch On	
-Landing gear lights Check 3 greens	
-Fuel Quantity Check	
-Cowl flaps Open	
After completion of the items above:	
-Master switch Off	
-Throttles Idle	
-Propeller controls Forward	
-Mixture controls Idle cut-off	
-Turbocharger control levers Up and lock	
-Cowl Flaps Open	
-Flaps Check full travel, then UP	
-Trims Center	
-Flight controls Check	
-Empty seats and seatbelts Secure	
-Bags Secure	
-Aircraft documents Check	

Action		Call
Outside Airplane:		
-Right wing, aileron and flap	Check	
-Right main gear	Check	
-Right wing tip	Check	
-Right leading edge	Check	
-Right fuel cup	Check and secure	
-Right engine nacelle	Check	
-Right propeller	Check	
-Cowl flap	Open and secure	
-Fuel drains	Drain	
-Nose section	Check	
-Nose gear	Check	
-Forward baggage door	Secure and lock	
-Windshield	Clean and secure	
-Left propeller	Check	
-Left engine nacelle	Check	
-Left fuel cup	Check	
-Left leading edge	Check	
-Left wing tip	Check	
-Left main gear	Check	
-Left wing, aileron and flap	Check	
-Pitot tube	Check	
-Stall warning vanes	Check	
-Rear door	Close	
-Left static vent	Check	
-Dorsal fin air scoop	Check	
-Empennage	Check	
-Stabilator	Check	
-Right static vent	Check	
-Antennas	Check	
-Nav and landing lights	Check	
		„Walk around inspection complete"

Engine start procedure:

Action		Call
<u>Before engine start:</u>		
-Parking brake	Set	
-Seats	Adjust	
-Seat belts	Fasten	
-Aircraft door	Close and secure	
-Avionics	Off	
-Alternate air (if installed)	Off	
-Alternators (Generators)	Off	
-Passenger emergency briefing	Complete	„In case of evacuation I will announce ***EVACUATE NOW, USE LEFT OR RIGHT DOORS***. Passengers will be required to open the assigned door and leave the aircraft as quick as possible leaving all belongings on board. In case of pilot incapacitation passengers may start evacuation without pilot's call"
-Before engine start checklist	Complete	***„Before engine start checklist"*** ***„Before engine start checklist complete"***
In case of at a Controlled Airport:		
-Master switch	On	
-COM Radios	On	
-Start-up clearance	Obtain	
-COM Radios	Off	
-Master switch	Off	

Action	Call
Starting engines:	
-Parking brake Checked Set	
-Master switch On	
-Ignition switches On	
-Electric fuel pumps On	
(off if the motors are hot)	
-Throttle Open ½ inch	
-Propellers Full forward	
-Mixture controls Idle cut-off	
-Anti-collision light On	
(If engines are cold, PRIME:	
-Electric fuel pump On	
-Throttle Full open	
-Mixture control Move to rich position until 3-4 GPH fuel flow is indicated and stabilized then move it idle cut-off)	
Throttle Open ½ inch	
-Propeller area clearance Verify	***"Propeller Clear"***
-Starter Engage	
-Mixture control Advance as engine starts	
-Oil pressure Check	***"Oil pressure checked"***
Note: Oil pressure should come within 30 sec may be longer in very cold weather	
- Set RPM to 1000 - 1200	
-Alternator On	
Repeat steps with the other engine. After both engines are running on idle:	
-Fuel pumps Both off	
-Fuel selectors Both X-feed	
-Fuel pressure Check	
-Vacuum gauge Check	
-Attitude indicator Set	
-Avionics On and set	
-Alternators Check on, check output	
-Clock Set	
-Navigation lights (at night only) On	
-After start checklist Complete	***„After start checklist"***
	„After start checklist complete"

Before Taxi procedure:

Action	Call
Before start to taxi: -Obtain WX information, QNH (Record ATIS, if applicable) -Altimeters (Both) Set Note: Confirm planned take-off performance and decision point match present weather and runway status. -Departure emergency review: Perform	**„Altimeters set and crosschecked"** ***If I decide to abort the take-off I will call REJECT. If I reject before rotation, I will close power levers immediately and apply maximum breaking. If I reject after rotation, I will check landing gear down 3 greens, set full flaps and land straight ahead. Stop the aircraft and set the parking brake. I will announce evacuation if needed. After decision point I will call CONTINUE. Set full power, maintain rwy heading and accelerate to Vyse (105 MPH). (Vxse, 90MPH until obstacles are cleared) At 500 feet check feathering procedure is complete, verify flaps up. Retract the gear with positive rate of climb. Identify the malfunction and start memory items when positive climb and aircraft control is achieved. In case of VMC I will join visual pattern of rwy XX and land/ in IMC I will follow IFR escape route or ATC instructions for landing"*** ***„Departure emergency review complete"***

If ATC provides departure clearance during taxi: -Aircraft Stop -Parking brake Set -Departure clearance Record -NAVAIDS Set, tune, identify -Departure procedure Review **<u>After taxi clearance received</u>:** -Taxi light On *Note: During taxi the pilot should check the following:* *-Operation of turn indicator, directional gyro and coordination ball instruments.* *-Heater and defroster* *-Rudder and Brakes* *-Trims*	***"Departure review complete"***

Before take-off procedure:

Action	Call
Run-Up check: *Note: Verify local regulations and the area behind the aircraft and complete RUN-UP check before every first take-off a day or after crew change.* -Parking brake Set -Fuel selectors On -Cowl flaps Open -Throttle Set 1500 RPM *Feathering Check (move propeller control fully back and then to the full forward position The RPM should drop to 1000 RPM in 1 - 3 seconds. Do not let RPM drop below 1000 RPM. Repeat 2-3 times.)* -Throttle Set 2000 RPM *-Magnetos check (Normal drop - 100 RPM, maximum drop - 175 RPM, maximum differential drop - 50 RPM)* *-Mixture check (move mixture lever towards lean, check RPM/FF drop)* *-Alternate air On/Off (if installed), (there should be a drop in RPM when the control is placed in the "ON" position)* -Throttle Set 2200 RPM *Governor check (Retard prop control until a 200 drop in RPM is indicated Repeat 3 times on the first fight of the day. Then adjust throttle +/- 2 in.Hg. The propeller speed should stay the same when the throttle is moved, showing that the governor is governing)*	

-Throttle Set <u>1000 RPM</u> *Alternator output – (check, approximately equal output for both alternators)* *suction check (Vacuum gauge - 4.5 to 5.2 in. A vacuum less than 4.5 indicates a low air flow through the gyro instruments, with possibly inaccurate readings)* *Fuel pressure check (Switch electric fuel pumps Off then On, fuel pressure should be in the normal operating range, 14-35 PSI)* -Throttle <u>Idle Power</u> *Idle RPM should be stable, between 700 and 900 RPM* **Repeat the run-up procedure for the other engine.** **<u>Before Line-up</u>**: -Electric fuel pumps On -Check engine gauges in green band -Propellers full forward -Mixture full forward -Throttle quadrant friction Adjust -Alternate air (if installed) Verify off -Cowl flaps Open (or as required) -Flaps Set for TO *Note: Set Flaps 0 for IFR Departures* Trims Set for TO *(6 units in SIM)* -Fuel selectors Verify On	
<u>At holding point</u>: Set parking rake.	***„Before Takeoff checklist"***
Complete before takeoff checklist.	***„Before Takeoff checklist complete"***

<u>When line-up clearance received</u>: -Check TO and APP area Clear -Taxi light Off -Landing light On -Pitot heat as required *Note: Set pitot heat on in icing condition* -Transponder On/Alt -WX Radar (if installed) On -Line up, align with the rwy, chk HDG **<u>When Take-off clearance received</u>**: -Check time	

Take-off procedure:

Action	Call
-Manual brake Set	
-Set 2000 RPM, hold the brakes	
(On a very hot day, and if the motor is hot, presence of fuel vapor is possible in the fuel lines. Set higher RPM for a few seconds)	
-Check RPM and FF indications are stable	
-Release the brakes and start rolling	
-TO power Set	
Power levers full forward (A/C) (SIM)	**„Take-off power set"**
Note: Right hand remains on power levers until decision point. Should aircraft handling become difficult it is allowed to use both hands during rotation until established in trimmed climb.	
-At speed indicator first movement	**„Speed alive"**
-85 MPH (76 KTS SIM) Rotate	**„Rotate"**
90 MPH (76 KTS SIM) Liftoff	
Rotate the aircraft and maintain Vxse, 90 MPH. (76 KTS SIM). When passing decision point and reland not possible:	**„Reland not possible"**
-Landing gear UP	**„Gear up, no lights"**
Note: Select gear up with positive rate of climb and verify retraction	
On normal takeoff, gradually accelerate to (Vy, blue line spd): 105 MPH (89 KTS SIM)	
Note: *Maintain the best angle of climb speed Vx, 90 MPH at sea level (76 KTS SIM) if obstacle clearance is necessary.*	

If clear of obstacles and terrain clearance is adequate, **At 500' AGL:**	
-Flaps 1 notch UP (if not UP)	
-Climb power Set	
24 inHG/2400 RPM (34/2500 SIM)	
Mixture Check full forward -Electric fuel pumps Off -Landing- and taxi lights Off	
-Cowl flaps as required	
At 1000' AGL:	
-After take-off checklist Complete	**"After take-off checklist"**
-Accelerate to enroute climb speed if applicable 120 MPH (105 KTS SIM)	**"After take-off checklist complete"**
Above 1000' AGL	
Mixture lean, I.A.W Pilots Operating Manual 8-11 (approx. 11 GPH FF) *(SIM: due to simulator feature, lean until fuel pressure decreases by 1 psi)* *Note: monitor cylinder head temperature and EGT* *Note: do not lean mixture at or below 1000' AAL (CAVOK limitation)*	
At Transition Altitude:	
Altimeters Set STD	**"STD Set and crosschecked"**

Cruise procedure:

Action	Call
-Power As required -COM 2 Monitor 121.5 Mhz Note: Normal cruise power is 21 inHg/2100 RPM (30/2100 SIM), *If cruising above 1000' AAL, adjust manifold pressure i.a.w. Power Setting Table, (POM 8-11, as necessary. (approx.. 8 GPH FF)* *Max. EGT 1526°F (if EGT gauge installed) (SIM: due to simulator feature, lean until fuel pressure decreases by maximum 1 psi) For maximum service life, cylinder head temperature should be maintained below 435°F during high performance cruise operation and below 400°F during economy cruise. Operate Cowl Flaps as necessary.*	

Cruise, Descent and Landing Procedure (VFR)

Action	Call
on **Downwind leg** -Monitor traffic, wind and downwind hdg at **Abeam Threshold**: -El. Fuel Pumps On -Landing gear Down -Mixture Rich -Cowl Flaps Open -Fuel selectors On after **completing base turn:** -Manifold pressure 13-15 inHg (SIM: limit throttle lever position to avoid LDG warning horn) -Flaps set 10 *Note: max. speed for flaps 10 extension is 160 MPH* -Start descending, maintain 110 MPH with flaps 10 *Remark: Sometime during the approach for a landing, the throttle controls should be retarded to check the gear warning horn* After **completing final turn**: -Flaps set 25 *Note: max. speed for flaps 25 extension is 140 MPH* -Maintain 100 MPH on final, reduce speed to 95 MPH at approximately 300' AAL -Prop. Levers Full fwd *Note: to avoid significant propeller noise, forwarding prop. levers can be delayed until short final* -Landing Lights On -complete Landing Checklist	***"Landing Checklist#*** ***"Landing Checklist Complete"***

Cruise, Descent and Landing Procedure (VFR) cont'd

Action	Call
On short final: -Last check on gears Down, 3 greens -Reduce speed to 90 MPH for flare *Remark:* *Reduce the speed in order to overfly the threshold with 90MPH (90 KTS SIM). Land with two hands on the controls. Use gradual manual braking.* *Delay the flap retraction on the ground until vacating the runway unless strong crosswind or gusty weather conditions exist or maximum braking required.*	**"Gear Down 3 greens"**

Descent Procedure IFR:

Action	Call
Approach preparation *Note: Get WX and landing condition (Record ATIS if available) and plan the approach before top of descent. Calculate landing performance. Set, tune, identify NAVAIDS during the preparation. It is permissible to continue the preparation during descent, but it must be completed before starting the approach at latest.*	
Approach Review -review STAR Instrument approach, Missed approach and after landing procedure -Approach minimums (DA, MDA, RVR, VIS) Check -G/A altitude Check -Min. Safe Altitude Check	**"Approach Review Complete"**
-Descent power 13-15 inHg/2100 RPM Set (SIM: limit throttle lever position to avoid gear warning horn) *Remark: Sometime during the approach for a landing, the throttle controls should be retarded to check the gear warning horn*	
-Mixture Enrich for smooth operation (EGT above 1300 °F, if EGT gauge installed) (SIM: set mixture lever full rich position) -Cowl Flaps Set -Fuel Selectors On -Seats and belts Set, fastened	
at **Transition Level** -Altimeters Set QNH	***"QNH xxxx, altimeters set and X-checked"***
-When entering traffic pattern, reduce speed to 120 MPH (120 KTS SIM)	

Approach procedure IFR:

Action	Call
When passing **initial approach fix**, or on **intercept heading**, or on **downwind leg:** Cowl flaps As required -Complete Approach Checklist **-2 NM before FAF or GS alive**: (latest **1 dot below GS or 1 NM before FAF**) -Electric fuel pumps On -Landing lights On -Landing gear Down -Mixture Rich -Alternate air (if installed) Off -Cowl flaps Open -Flaps Set 10 *Note: max. speed for flaps 10 extension is 160 MPH. Maintain 110 MPH (110 KTS SIM) with flaps 10 extended* -Fuel selectors On **Intercepting GS or descent profile** or at FAF: -Descent power set approx.15 inHg -Start descending *Note: At FAF or GS intercept verify distance and altitude* **At 4nm final**, OM, or equivalent position -Propellers Full fwd. -Flaps set 25 *Note: max. speed for flaps 25 extension is 140 MPH. Maintain 100 MPH (100 KTS SIM) with flaps 25 extended* *Note: if flaps 40 is required by landing performance, select Flaps 40 at pilot's discretion, when rwy is in sight and landing is assured. Reduce the speed in order to overfly the threshold with 90MPH, 87MPH for short field ldg.(90 KTS SIM) In IFR land with flaps 25.*	***"Approach Checklist"*** ***"Approach Checklist Complete"*** ***„Passing FAF/On Glideslope xxxx feet checked"*** ***„Passing OM, xxxx feet checked"***

Approach procedure IFR (cont'd):

Passing 1000' AAL (Circling 300' AAL):	
-Landing checklist Complete	***„Landing Checklist"***
	„Landing C/L complete"
Approaching minimum by 100 feet:	***„Approaching minimum, Gear down 3 greens"***
At minima:	***„Landing/Go-around"***

Landing procedure:

Action	Call
<u>When visual at minima</u>: Reduce the speed in order to overfly the threshold with 90Mph (90 KTS SIM). Land with two hands on the controls. Use gradual manual braking. Delay the flap retraction on the ground until vacating the runway unless strong crosswind or gusty weather conditions exist or maximum braking required.	***„Landing"***

Taxi in procedure:

Action	Call
<u>After vacating the runway</u>: -Landing lights Off -Taxi light On -Electric fuel pumps Off -Flaps Up -Cowl flaps Check Fully open -Transponder Off -WX Radar (if installed) STBY	

Shut down procedure:

Action		Call
At stand:		
-Parking brake	Set	
-Avionics	Off	
-Mixture	Idle-cutoff	
-Alternators	Off	
-Magnetos	Off	
-Nav & strobe lights	Off	
-Avionics	Off	
-WX Radar (if installed)	Off	
-Master switch	Off	
-Shutdown checklist	Complete	***"Shutdown Checklist"*** ***„Shutdown checklist complete"***

Missed approach procedure:

Action	Call
<u>In case of go-around</u>: -Go-around power Set Full forward (A/C) (SIM) -Propellers Check full forward -Mixture Check rich -Rotate (approx. 8-10°, 12°SIM, with approx. 3°/sec) -Flaps 1 notch up -Check Positive rate Gear Up *Note: Check speed is above VMC before flap retraction. Retract the gear with positive rate of climb.* Gradually accelerate to (Vy, blue line spd): 105 MPH (89 KTS SIM) *Note: Maintain the best angle of climb speed Vx, 90 MPH at sea level (76 KTS SIM) if obstacle clearance is necessary.* If clear of obstacles and terrain clearance is adequate, *At **<u>500' AGL</u>***: -Check speed Flaps up (1 notch Up, if not Up) -Climb power Set 24inHg/2400 RPM (34/2500SIM) -Electric fuel pumps Off -Landing- and taxi lights Off -Tune radios for go-around and contact ATC. At **<u>1000' AGL</u>** -Flaps Verify flaps are retracted -After take-off checklist Complete -Accelerate to enroute climb speed, if applicable 120 MPH (105 KTS SIM)	***"After TO Checklist"*** ***"After TO Checklist Complete"***