**Operation of N4159M (adopted from *Piper POH* & Owner Experience)** 8-6-2025 LRS

**Items in *Blue Italics* are required items from Piper POH**

 **Fight Planning: -**

1. Aircraft Paperwork / ARROW - All onboard & current
2. Mission Needs - Fuel / Oil / Pax / Baggage / Mission / Weight & Ballance
3. Preheat Engine - when ambient temp <55° F
4. Typical Oil - Phillips XC 20W-50 and Cam additive
5. Juggle as desired - Interior / Exterior Pre-Flight checks / Baggage Loading
6. Remove & Stow - Exterior Covers, Tie-Downs
7. Accessories Setup - Headsets, iPads, ADS-B In, Device power & cords, etc.
8. MWR equip - Flight Bag, Carry-on, Sunglasses, Music, Window Covers, Water, Coffee, Hats, Jackets, Blankets, Snacks, Food Coolers, Tools (under seat), etc.

 **Pre-Flight: -**

**Interior**

1. Doors - Open
2. Stow - Seat Belts, Seats Back, Rear Stick, Window Covers & Tow Sign
3. Circuit Breakers - In
4. Mags - Off
5. Master - On
6. Voltage - > 11.7 v
7. Avionics - On, all temps and indications as expected / ambient, etc.
8. Tach (EI) & Flight Log

 review last entry, squawks, enter Tach Time Start, Fuel, Oil, etc.

1. Oil Temp (EI) & EIS (EI)

 all Readings / Temps agree & logical

1. EMS (EI)

 Fuel Level Gages sync w/Totalizer Quantity - Check & Set as desired

1. Fuel Selectors - Start Up on lowest
2. Nav Lights (+ ADS-B) - On
3. Strobes - On
4. Landing & Taxi Lights - On

 Walk Around - Check Lights as required

 Fuel Drains - Drain and check all 3

1. Master - Off
2. Flight Controls & Sticks - Check with and w/o Flaps
3. Seats - Check Secure
4. ***Parking Brake*** - as required
5. Trim - Takeoff

 **Exterior:**

* 1. Stdb Wing - ELT Antenna, Flaps, Aileron, Tip, Lights, VGs, Fuel Level & Cap, Struts
	2. Nose/Engine - Pre-Heater, Cowling, Intakes, Induction, Propeller, Alternator & Belt, Spinner, Fuel Drain, Oil (> 4 Qts., 4.5 Qts. for legs > 3 hrs), Dipstick, Secure Cowling
	3. Landing Gear - Tires, Gear, Brakes, Shocks
	4. Port Wing - Fuel Level & Cap, VGs, Struts, Pitot Tube, Tip, Lights, Aileron, Flaps, Com Antenna
	5. Aft Fuselage - Empennage, Jack Screw, Flying Wires, Tail Wheel, XPNDR
	6. Windscreen - Clean
	7. Equipment Cooler - Inventory, Organize, Stow
	8. Chocks - Remove & Stow
	9. Baggage Door - Secured / Locked

 **Pre-Start: -**

* 1. Brief Passengers FAR 91.519 - No Smoking / Seat Belts / Shoulder Harness /

 Normal & Emergency Exit / Survival Equipment / CRM / Sterile Cockpit

* 1. Baggage Door - Check Closed
	2. Seat Belts / Shoulder Harness - On
	3. Headsets - On
	4. Landing Gear / ***Parking Brake*** - as desired
	5. Strobes - On
	6. Nav Lights / ADS-B - On
	7. Other Switches - Off
	8. Master Switch - On
	9. ***Carb Heat*** - Operate & check closed
	10. Flaps - Test Operation & set to Take-Off
	11. Doors, Windows, Heating, Cooling, Vents - as desired

 **Start: -**

* 1. Fuel - Lowest Tank
	2. ***Prime*** - Full Throttle & Full Mixture. Prime as required, lock, Wait 20 s …
	3. Start - Start on Left Mag only, Clear Prop !, ***Press Starter Switch*** (Try Alternator Field OFF)
	4. Throttle - Idle / Slowly move forward while cranking
	5. Right Mag On / Throttle Idle 700 - 800 RPM
	6. EI Oil Pressure - @ ***Idle > 24 psi***
	7. ***Mixture*** - Taxi Lean
	8. Lights - Strobes + Taxi (flashing) / Landing as desired
	9. Alternator Field - On

 **Avionics: -**

* 1. Avionics Master Switch - On
	2. Com - Set-Up frequencies
	3. Nav - Aera 560
	4. Flight plan - Enter Something / Anything !
	5. iPads - Update Flight Plan, establish links, etc.
	6. AV-30 AI / Transponder - should show Ground Mode. Set Squawk Code (VFR, etc.)

 **Taxi Out: -**

* 1. Flight Controls - Position for Wind Direction
	2. Seats and Rail Locks - Adjusted and Secure
	3. Fuel Tanks - Both
	4. Oil and CHT Temps - Wait for > 85° OT, > 200° CHTs
	5. Alternator / Voltage - check operation & > 12.0 v
	6. Parking Brake - Off
	7. Brakes - Test
	8. Instruments - Proper movement

 **Run-up: -**

* 1. Flight Instruments (ASI, AIs, Altimeters) - Check & Set
	2. Flight Controls - Check Free and Clear with Flaps Up and Down (up yours, up mine, up ours)
	3. Flaps - Up
	4. ***Mixture*** - Full
	5. Mags - Both On
	6. @ 1700 RPM:
1. Set ½ Mixture
2. MP, Oil P, Oil T - Check
3. Fuel Flow - ~ 2.5 gph
4. Magnetos - Check for Drop < 130 RPM each
5. Carb Heat - Check for Drop and Operation
	1. EI Instruments - all Temps agree & logical, Voltage, Amps, etc. Set FF to GPH
	2. Transponder - Check Squawk Code & Mode “**ALT”**
	3. Com Radio - Check / Set Frequencies
	4. GPS - Set destination / plan Turn Out
	5. Flaps - desired Take-Off setting (typically 1st notch)
	6. Trim - desired Take-Off setting (typically nose low)
	7. Fuel Tanks - Both On
	8. Lights - As desired
	9. ***Carb Heat*** - Off, Primer - locked
	10. Doors & Windows - Close & as desired
	11. Seat Belts - On
	12. ***Parking Brake*** - Off, Pump up, all peddles “Clear”

 **Take-Off: -**

* 1. Radio - Announce Take-Off and Departure intentions.
	2. Fuel - Both Tanks On
	3. **Lineup & Wait** - Cleared for TO? Check Correct Runway & Heading
	4. **Brakes on & Full RPM** - Check Engine in the Green
1. Oil Pressure > 40 psi
2. Fuel Flow > 9 GPH
3. RPM ~ 2350
	1. **GO !** - **Check … Airspeed Alive ? RPM ~ 2700,** **FF > 10 gph**, **CGTs < 400****°**
	2. **FLY !** - Rotate ~ 40 mph, Vx ~ 50 - 55 mph w/TO Flaps, Flaps Up, Vy ~ 70 - ***75 mph***
	3. Clean Up - Tap Brakes, < 70 mph Flaps up, typical Climb-Out 70 - ***75 mph*** no flaps
	4. Radio - Announce departure intentions
	5. CHT’s - < 400°

 **Climb: -**

* 1. Climb - Initial 70 mph
	2. Transponder - Check Squawk Code & Mode “**Alt**”
	3. Other Climbs - for hot CHTs: Lower Nose, Enrichen Mixture, Reduce RPM as needed

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Type | RPM | ~ AS mph | ~ FPM | Mixture | Flaps | CHT°F | ~ FFgph |
| **Vx** | **2700 (max)** | **65** | **600** | **Best Pwr** | **10** | **400** | **12** |
| **Vy** | **2650** | **70** | **333** | **Full** | **Up** | **390** | **11** |
| **Cruise** | **2600** | **75 +/-** | **> 200** | **Lean as req** | **Up** | **< 385** | **10** |
|  |  |  |  |  |  |  |  |

 **Cruise: -**

@ Target Altitude: Level Off, Trim, RPM 2400, FF 7.5, then iterate / adjust …

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Type | Altitude ft | RPM | ~ GS mph | CHT°F | ~ FFgph | notes |
| **Low Altitude** | **< 5500** | **2400** | **100** | **375** | **< 6.0** |  |
| **Normal** | **> 5500** | **2350 -2400** | **100** | **365** | **5.5** | **~ 15 mpg** |
| **+Speed** | **> 5500** | **2450 -2550** | **110** | **385** | **8.0** |  |
| **+Altitude** | **> 9000** | **2450** | **105** | **385** | **7.0** |  |
| **+Endurance** | **Lowest** | **2200** | **75** | **379** | **< 4.5** | **> 8 hrs** |
| **+Range / MPG** | **> 8000** | **2300** | **85** | **375** | **5.0** | **> 600 mi** |
|  |  |  |  |  |  |  |
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 **Descent: -**

* 1. Start WX and Approach Planning - VFR 0:30 out
	2. Use Foreflight, Cruise Altitude, Winds, ATC, etc. to arrive 2000’ AGL & 3.5 NM prior to destination ... @ 10-30, plan -500 +/- 200 fpm @ 2 miles a minute & 90 mph a 5,000’ descent takes 10 minutes and 20 miles
	3. Clean Up - Stow MWR and other unneeded kit
	4. RPM &Throttle - 2200 & MP < 17” until pattern
	5. @ 2000’ AGL & 3 miles - **Slow Down !** … Carb Heat, Flaps < 65 mph

 **Landing: -**

1. Seat Belts & Shoulder Harness - On
2. Seat and Rail Locks - Adjusted and Secure
3. Parking Brake - Off, Brake Area Clear

 CGLUMP - Check … (FAF / Mid-Field Downwind)

1. Carb Heat - On
2. Fuel Tanks - Both On
3. Lights - Strobes On, Landing/Taxi (Flash) as desired
4. Landing Gear - Look at each Gear, check Gear Type
5. Parking Brake - Off, clear Floor and Brake Areas - Advise PAX
6. Brakes - Pump up, peddles clear
7. Mixture - Set for Go-Around
8. Trim - Typically Nose Down
9. Flaps - ***Max 85 mph*** - suggested speeds …

 < 65 mph / 15° (Downwind)

 < 55 mph / 30° (Base)

 < 45 mph / 45° (Final)

 (for gusty or max X-Wind use less flaps and > 50 mph as appropriate)

1. Decent Rate - Manage with Power
2. Landing Gear - Check Parking Brakes OFF !
3. Short Final -
4. **40 mph** for Normal Landing w/Flaps

 ***Vs1 ( Clean Stall ) = 49 mph***

 **Vs0 ( per Flight Tests Minimum w/Full Flaps & No Power) ~ 30 mph \_\_\_\_\_\_\_**

1. **Engine Green ?**
2. **Cleared to Land?**
3. **Correct Runway?**
4. **Runway Clear ?**
5. Slow Down - Brakes, Elevator, Flaps, **Don’t Turn and Brake at same time !**
6. Flight Controls - Set for Wind Direction
7. **Clear Runway** before touching much else !

 **Taxi In: -**

1. **Stop !**
2. Flight Controls - Position for Wind Direction
3. Flaps - Up
4. Trim - Take-Off Setting
5. Mixture - Taxi Lean
6. Lights - as desired
7. Doors & Windows - as desired

 **Shut Down: -**

1. Magnetos - Test
2. Alternator - Test
3. EI - Check Temps, Voltage, Amps, etc.
4. Mixture - Lean slowly to Cutoff
5. Mags - Off
6. Parking Brakes - as desired
7. JPI - (Photos) Fuel Used, Fuel Remaining, Tach Time
8. Avionics Master - Off
9. Master Switch - Off
10. Nav & Strobes - Leave On
11. Other Switches - Off
12. DC Adapters, Accessories & Cabin Lights - Unplugged & Off
13. Flight Log - Record Ending: Tach Time, Fuel used & remaining, Fuel & Oil added, Costs, Squawks, Mission, etc.

 **Tie-Down / Secure: -**

1. Windows - As Desired
2. Parking Brake - as desired
3. Tow/No-Tow Sign - as desired
4. Chocks & Tie Downs - as desired
5. Pre-Heat - Plugged in & Cowl Cozzi as desired
6. Battery Charger - Plug In
7. Supplies & Baggage - Stow / Remove
8. Trash & Stuff - Pickup
9. Windscreen Shade / Signs - as desired
10. Exterior Covers / Pitot Cover - as desired
11. Stick - Secure with Seat Belt as needed
12. Master Switch - Off
13. Courtesy Lights - Off
14. Cabin Doors & Baggage Door - Closed & Locked

Add - Emergency Procedures for TO, Engine Failure, etc & make a VFR vs. IFR Version ? ***Glide Ratio 11:1 @ ~ 65 mph*** Get PA-18 POH

Check for FMS’s for: Increased GW, VG’s, PA-18 Tail, Other ?