



**ALPI AVIATION
PIONEER 400**

PILOT'S OPERATING HANDBOOK

FOR MICROSOFT FLIGHT SIMULATOR

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DISCORD



OBY1.EU



YOUTUBE



V_A MAX STRUCTURAL OPERATING SPEED	Maximum speed for full application of the primary flight controls.
V_H MAX STRAIGHT LEVEL SPEED	The speed that can be achieved only in straight level, non-accelerated flight in calm air at max continuous power.
TRUE AIRSPEED	The airspeed expressed in KT or KMH relative to ambient air. (CAS corrected for altitude and temperature influence).
V_{FE} MAX FLAP EXTENDED SPEED	The highest speed permissible with wing flaps in the prescribed extended position. It coincides with the maximum speed for landing gear extraction.
V_{NO} MAX STRUCTURAL CRUISING SPEED	The speed that should not be exceeded except in smooth air, and then only with caution.
V_{NE} NEVER EXCEED SPEED	The speed limit that may not be exceeded at any time.
V_{RA} ROUGH AIR SPEED	The maximum allowed airspeed in case of turbulent air.
V_{S1} STALL SPEED	The speed at which the airplane stalls in clean configuration, i.e. with all flaps retracted.
V_{SF1} STALL SPEED	The stall speed or minimum steady flight speed at which the airplane is controllable with flaps extracted at first stage.
V_{SO} STALL SPEED	The stall speed or minimum steady flight speed at which the airplane is controllable in the landing configuration (full flap).
V_X BEST ANGLE-OF-CLIMB SPEED	The speed which results in the greatest gain of altitude in a given horizontal distance.
V_Y BEST RATE-OF-CLIMB SPEED	The speed which results in the greatest gain in altitude in a given time.
V_{EMAX} MAX EFFICIENCY SPEED	Speed that maximizes aerodynamic efficiency. It coincides with the V_Y and with the speed that maximizes the horizontal flight distance while gliding.
NORMAL TAKEOFF SPEED	Speed required to take-off and climb over a 15 m (50 ft) obstacle.
SHORT TAKEOFF SPEED	Speed required to take-off and climb over a 15 m (50 ft) obstacle in case a shorter take-off is required.
NORMAL LANDING SPEED	Speed required to stop the airplane after passing above a 15 m (50 ft) obstacle.
SHORT LANDING SPEED	Speed required to stop the airplane after passing above a 15 m (50 ft) obstacle in case of shorter landing is required.
TAKEOFF ROTATION SPEED	Speed at which it is possible to apply control inputs to make the aircraft nose to pitch up for lif-off.
LIFTOFF SPEED	Speed at which the aircraft effectively starts to detach from ground.

DESCRIPTION	VALUE
V_A	215 Km/h (116 Kts)
V_{FE}	150 Km/h (81 Kts)
V_H	270 Km/h (146 Kts)
V_{NE}	278 Km/h (150 Kts)
$V_{NO} = V_{RA}$	237 Km/h (128 Kts)
V_R	127 Km/h(69 Kts)
V_{S1}	115 Km/h (62 Kts) (Clean engine idle)
V_{S0}	101 Km/h (55 Kts) (Landing engine idle)
V_{SF1}	104 Km/h (56 Kts) (Take-off)
V_X clean configuration	123 Km/h (66 Kts)
V_Y clean configuration	157 Km/h (85 Kts)
V_{EMAX}	157 Km/h (85 Kts)
NOTE: All the speed values are referred to Indicated Air Speed.	

AIRSPEED INDICATOR RANGE MARKINGS

MARKING	RANGE	DESCRIPTION
White Arc	101 – 150 Km/h (55 - 81 Kts)	Full-flap operating range. Lower limit is stall speed in landing configuration (V_{s0}). Upper limit is max speed permissible with flaps extended (V_{FE}).
Green Arc	115 - 237 Km/h (62 - 128 Kts)	Normal operating range. Lower limit is the clean stall speed (V_{S1}). Upper limit is max operating structural speed (V_{NO}/V_{RA}).
Yellow line	215 Km/h (116 Kts)	Design manoeuvre speed. Optionally installed.
Yellow Arc	237 - 278 Km/h (128 - 150 Kts)	Operations must be conducted with caution and only in still air. The lower limit is V_{NO}/V_{RA} and the upper one is the never exceed speed (V_{NE}).
Red Line	278 Km/h (150 Kts)	Never exceed speed (V_{NE}).

STALLING SPEED @MTOW

@ Engine idle

FLAP SETTING	Retracted	Stage 1 (Takeoff)	Stage 2 (Landing)
Designation	V_{S1}	V_{SF1}	V_{S0}
Stall speed	115 Km/h (62 Kts)	104 Km/h (56 Kts)	101 Km/h (55 Kts)

CROSSWIND AND WIND LIMITATION

The maximum demonstrated crosswind velocity is $V_{WIND} = 28 \text{ Km/h (15 Kts)}$.
 The maximum speed in presence of gust must be established to be below **180 Km/h (97 Kts)**.

POWERPLANT LIMITATION

Gauge	YELLOW ARC		GREEN ARC	YELLOW ARC	RED LINE
Tachometer	1000 - 1800 RPM		1800 - 5500 RPM	5500 - 5800 RPM Max. 5 minutes	5800 RPM
Maximum RPM for all operations				5500	
Oil Temp.	50 °C (122 °F)		50 - 120°C (122 - 248 °F)		120 °C (248 °F)
Oil temp. at ground idle, start procedure and warm up (min max)				-20 °C (-4 °F)	100 °C (212 °F)
Oil Temp. for takeoff (min max)				50 °C (122 °F)	120 °C (248 °F)
Oil Pressure	0 – 0.8 bar (0 - 11 psi)	0.8 - 2.0 bar (11 - 29 psi)	2.0 - 5.0 bar (29 - 72 psi)	5.0 – 7.0 bar (72 - 101 psi) For a short period at cold start	7.0 bar (101 psi)
Oil Pressure for RPM < 3500			Min: 0.8 bar (11 psi)		
Oil Pressure for RPM > 3500			Min: 2.0 bar (29 psi)		
Coolant	50 - 60 °C (122 - 140 °F)		60 - 120 °C (140 - 248 °F)		120 °C (248 °F)
Coolant temp. at ground idle, start procedure and warm up (min)					-20 °C (-4 °F)
Maximum EGT			950 °C (1742 °F)		
Max EGT-Split			200 °C (392 °F) at > 3 lt/hr fuel cons.	500 °C (932 °F) at < 3 lt/hr fuel cons.	
Maximum CHT			135 °C (275 °F)		
Ambient temperature			Max at start : 50 °C (122 °F) (ambient temperature)		
			Min at normal operations : -40 °C (-40 °F)		
			Max at normal operations : 50 °C (122 °F)		
Fuel Pressure at fuel rail			Min : 2.9 bar (42 psi)		
			Max : 3.2 bar (46 psi)		
Acceptable fuel pressure exceedance (max 3 seconds)			Min : 2.5 bar (36 psi)		
			Max : 3.5 bar (51 psi)		
Boost pressure (min max)			Ambient press.	53.15" (1800 hPa)	
MAP			Min : 1.77" (60 hPa)		
			Max : 53.15" (1800 hPa)		
Manifold temperature			80 °C (176 °F)		

The data in the G3X may not match due to technical limitations

0 [ft]							
RPM	MAP[inHg]	[hp]	POWER [%]	FC[Lt/hr]	TH[%]	TAS[km/h]	TAS[kts]
4100	35.6	75	55%	18.9	97.5	212	114
4500	37.5	90	65%	22.6	97.9	230	124
4900	38.5	105	75%	26.8	99.8	245	132
5400	43.3	137	100%	39.8	100.0	NN	NN
5800	50.8	160	120%	49.2	100.0	NN	NN
3000 [ft]							
RPM	MAP[inHg]	[hp]	POWER [%]	FC[Lt/hr]	TH[%]	TAS[km/h]	TAS[kts]
4200	34.6	75	55%	18.8	97.3	218	118
4600	36.6	90	65%	22.9	97.5	236	127
4900	38.2	105	75%	26.8	97.7	252	136
5400	43.4	137	100%	39.8	100.0	NN	NN
5800	51.0	160	120%	49.2	100.0	NN	NN
6000 [ft]							
RPM	MAP[inHg]	[hp]	POWER [%]	FC[Lt/hr]	TH[%]	TAS[km/h]	TAS[kts]
4300	33.7	75	55%	18.9	97.0	223	120
4600	36.1	90	65%	22.9	98.0	243	131
4900	38.2	105	75%	26.4	97.9	257	139
5400	43.2	137	100%	39.9	100.0	NN	NN
5800	51.0	160	120%	49.2	100.0	NN	NN
9000 [ft]							
RPM	MAP[inHg]	[hp]	POWER [%]	FC[Lt/hr]	TH[%]	TAS[km/h]	TAS[kts]
4400	32.9	75	55%	19.0	97.5	229	124
4700	35.1	90	65%	22.5	97.5	250	135
5000	37.8	105	75%	26.5	97.6	267	144
5400	43.3	137	100%	39.9	100.0	NN	NN
5800	51.0	160	120%	49.2	100.0	NN	NN
12000 [ft]							
RPM	MAP[inHg]	[hp]	POWER [%]	FC[Lt/hr]	TH[%]	TAS[km/h]	TAS[kts]
4500	31.7	75	55%	19.0	96.9	235	127
4700	35.1	90	65%	22.6	97.9	257	139
5100	37.3	105	75%	26.5	97.0	275	148
5400	43.1	137	100%	39.9	100.0	NN	NN
5800	50.2	160	120%	49.2	100.0	NN	NN
15000 [ft]							
RPM	MAP[inHg]	[hp]	POWER [%]	FC[Lt/hr]	TH[%]	TAS[km/h]	TAS[kts]
4600	31.7	75	55%	18.9	97.7	241	130
4800	34.8	90	65%	22.6	97.0	264	143
5200	38.0	105	75%	26.8	97.3	283	153
5400	43.7	137	100%	39.9	100.0	NN	NN
5800	51.6	160	120%	49.2	100.0	NN	NN

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PRE FLIGHT CHECKS

Master	ON
Strobe & Navigation Lights	ON
Strobe & Navigation Lights	WORKING
Master & Lights	OFF
All switches	OFF
Lane A and Lane B	OFF
Gascolator	DRAIN: check for no dirt and/or water
Fuel level	Visually check fuel inside tanks
Oil level	Check according to EOM
Expansion tank level	Check according to EOM
Overflow bottle level	Check according to EOM
Mechanical components	Check according to EOM
Electronic components	Check according to EOM
Gear box	Check according to EOM
Exhaust system	Check according to EOM
Propeller (bolts)	SECURED
Propeller (play)	NORMAL
Propeller (blades)	UNDAMAGED
Spinner bolts	SECURED
Cowling screws	SECURED
Nose landing gear (general)	UNDAMAGED
Nose landing gear (tires)	WITHIN LIMITS
Nose landing gear (blots)	SECURED

RIGHT SIDE CHECKS

Main landing gear (general)	UNDAMAGED
Main landing gear (tires)	WITHIN LIMITS
Main landing gear (blots)	SECURED
Fuel (check)	DRAIN min. quantity of fuel
Fuel (inspect)	CHECK for no dirt and/or water
Wing leading edge	UNDAMAGED
Wing fuel tank	VENT FREE (not present in case of AUX installed)
Wing Pitot tube	REMOVE & CHECK PROBES
Aileron (hinges)	UNDAMAGED
Aileron (control push-rod)	UNDAMAGED
Flap (hinges)	UNDAMAGED
Flap (control push-rod)	UNDAMAGED
Flap (play)	NORMAL
Fuselage	UNDAMAGED
Elevator (hinges)	UNDAMAGED
Elevator (attachments)	UNDAMAGED
Elevator (bolts)	SECURED
Rudder (hinges)	UNDAMAGED
Rudder (bolts)	SECURED
Rudder (movement)	FREE
Fuselage tail cone	SECURED

REPEAT ON LEFT SIDE

PRIOR TO START UP CHECKS

Airplane documents	CHECK availability and validity
Safety equipment	CHECK presence (if prescribed)
Gear switch	DOWN
Gear emergency handle	CHECK PRESENCE
Internal controls and cables	FREE
Baggage & tools	SECURED
Parking brake	ON & PUMP TWICE
Master	ON
Flap	FULL UP
Fuel selector	Select the lower level, if the same select the RIGHT
Throttle	IDLE
Switches	OFF
Breakers	IN
Ahead and behind free	CLEAR & SHOUT OUT "CLEAR PROP"

ENGINE STARTING

Fuel pump 1	ON
Lane A	ON
Lane B	ON
Propeller Area	CLEAR
Temp. Switch	Raise and HOLD
Warning indicators	OFF within 7 secs
Throttle	SET according to Oil Temperature
Engine Start	PRESS
Temp. Switch	RELEASE
Throttle	SELECT as required
Oil pressure	>2.5 bar within 10 secs
Warning indicators	OFF
Engine instruments	Within operating limits
Throttle	2400 RPM engine warmup

AFTER STARTING

Oil pressure	Within GREEN ARC
Throttle	2300-2500 RPM
Nav. Lights	ON
Radio + Nav. instruments	ON
Engine warm up Water temperature	60 °C (140 °F)
Engine warm up Oil temperature	50 °C (122 °F)

BEFORE TAKEOFF

Parking brake	ON
Doors/canopy	CLOSED & LOCKED
Fuel selector	Select the higher level, if the same select the LEFT
Altimeter	SET
Trims	NEUTRAL
Propeller Pitch	FINE

LANE AND IGNITION CHECKS

Lane A	For 3 sec Lane A: OFF; max drop: 50RPM
Lane A	ON
Warning indicators	EXTINGUISHED within 7 secs
Lane B	For 3 sec Lane B: OFF; max drop: 50RPM
Lane B	ON
Warning indicators	EXTINGUISHED within 7 secs

WASTEGATE AND PCV CHECKS

Throttle		FULL
Governor		Adjust to get 4700 RPM
Lane A		OFF for 20 secs
Operating limits/warning/indicators		CHECK
Lane A		ON
Wait		3 secs
Throttle		FULL
Governor		Adjust to get 4700 RPM
Lane B		OFF for 20 secs
Operating limits/warning/indicators		CHECK
Lane B		ON
Wait		3 secs

FUEL PUMPS CHECK

Throttle		4000 RPM
Fuel pump 1		OFF
Fuel pressure		± 0.1 bar
Fuel pump 1		ON
Fuel pump 2		OFF
Fuel pressure		± 0.1 bar
Fuel pump 2		ON

ELECTRIC PROPELLER CHECK (REPEAT 3 TIMES)

Throttle		Set 4000-4500RPM
Select		MAN mode
Pitch		Increase and check for RPM DROP and MAP INCREASE
Select		AUTO mode and check RPM INCREASE
Propeller Pitch		5700 RPM - MAP $\geq 44'$

HYDRAULIC PROPELLER CHECK (REPEAT 3 TIMES)

Throttle		Set 4000-4500RPM
Pitch (blue lever)		BACKWARD & CHECK RPM DROP & MAP INCREASE
Pitch (blue lever)		FORWARD & CHECK RPM INCREASE & MAP DROP
Full/Max power		5700 RPM - MAP $\geq 44'$

FURTHER CHECKS

Throttle		Set to 1600/2100RPM & CHECK for smooth running
Parachute safety pin (if any)		UNLOCK
Seat belts		FASTENED (Pilot and Passenger)
Passenger briefing		CHECK
Flap		1 st stage
Controls surfaces		FULL & FREE movements
Radio		Verify frequency & call for instructions/information
Final approach		FREE
Brakes		RELEASE
Doors/canopy		CLOSED & LOCKED

NORMAL TAKEOFF

Flap		1 st stage (check)
Fuel Pumps (1+2)		ON
Throttle		FULL POWER smoothly up to 5700 RPM - MAP $\geq 44'$
Rotation		at 127 Km/h (69 Kts) lift the nose wheel and maintain up to liftoff at 132 Km/h (71 Kts)
Landing Gear		BRAKE-CENTRALIZE-RETRACT
Climb Speed at VX or VY		123 Km/h or 157 Km/h (66 Kts or 85 Kts)

AFTER TAKEOFF

Flap	FULL UP
MAP	< 35"
Propeller pitch	< 5500 RPM
Climb Speed at VX or VY	123 Km/h or 157 Km/h (66 Kts or 85 Kts)
At 150 m (500 ft) reduce power to	5000RPM
Fuel pump 2	OFF at safety altitude ONLY

APPROACH TO LANDING

Parking brakes	CLEAR
Speed	WHITE ARC
Landing Gear	DOWN, wait for 3 green light and visually check
Fuel pumps (1+2)	ON
Propeller Pitch	FINE (blue lever full forward)
Flap	1 st stage
Trim	As required
Landing light	ON

NORMAL LANDING

Speed	143 Km/h (77 Kts)
Flap	FULL DOWN, below 150 Km/h (81 Kts)
Power	Over the obstacle: IDLE
Touchdown	116 Km/h (63 Kts)
Brakes	Apply as required
Flap	MOVE UP as appropriate for braking/taxiing

ENGINE STOP

Throttle	2000 RPM for 2 min (cooling)
Parking brake	ON
Operating limits and Warning Indicators	CHECK
Throttle	IDLE
Trims	NEUTRAL
Instruments	OFF
Flap (with step)	FULL UP
Flap (without step)	FULL DOWN
Lane A	OFF
Lane B	OFF
Fuel pump 1	OFF
Fuel pump 2	OFF
Equipment	OFF
Master key	OFF
Key	REMOVE
Parachute insert safety pin (if installed)	INSERT



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