

BOOKLET WITH THE APPS

A) REVIEW the basics of aerodynamics

- Forces acting on the plane
- Engine's effect's
- Flight Control's effect
- The Climb
- The Descent
- The Turn
- The Stall, The Symmetry/Coordination of flight, The spin
- Drawing Curve Lift/drag
- The Stall in turn symmetric and assymmetric
- Cross Wind Takeoffs and Landings:
 - Crab/Decrab Method
 - Crosswind wing low / Opposite rudder. Slip Method

B) REVIEW All Emergency procedures on your plane

- Fire from fuel on the ground (during starting procedure) and in flight
- Fire from electrical devices ground and in flight
- Engine failure: during take-off, initial climb (Best banking angle to loose less height in a 210° turn) or in flight / Emergency landing
- Loss of oil pressure, during aerobatics or ferry flight
- Bail out procedure
- Controls malfunctions / Jammed Flight Controls

C) Pre requisites for aerobatics

- Item 1: Tail dragger Familiarisation
- Item 2: Effects of Flight Controls : Elevator, Ailerons, Rudder Straight and Level and Inverted, Adverse yaw and induced roll
- Item 3: Engine forces: P factor, engine torque, prop wash, Precession; Straight and Level, 45° up and Vertical up
- Item 4: Trim setting and Premaneuvering checks: Harness, engine/fuel, airspace
- Item 5: Attitude acquisition: Straight and Level, Inverted at different speeds. Link between Engine's cooling position with reference to horizon, Angle of attack and power settings
- Item 6: Flight Controls efficiency/response at different speeds, and power settings
- Item 7: Slow speed flying Upright and Inverted
- Item 8: Slips and Skids Straight and Level
- Item 9: Spirals
- Item 10: Stalls Straight and Level/Inverted, link between Angle of Attack / Lift / Drag / Stall / Spin, at minimum speed symmetric and asymmetric / Dynamic symmetric
- Item 11: Slipping and Skidding turns, asymmetric stalls in turns
- Item 12: Link between pitch rate, speed, G's
- Item 13: Positioning/placing on various trajectories, and stick pressure neutralization
- Item 14: Box entries at different speeds, altitude, attitudes, Wing Rocking
- Item 15: Simulated engine Failure exercises, from different positions in the box/runway/axis and at different speeds and altitudes
- Item 16: Lazy 8, Barrel rolls, unusual positions/attitudes recovery procedures including Spirals (Notably inverted turn)

NB: Each mission must include a ground briefing, inflight demonstration, trials by the student pilot commented by the Flight instructor, then observed by the FI, and a post flight debrief

Every BRIEFING includes theoretical aspects, demo with a model, explanation of the classical errors, and tricks known by the FI, stressing on safety issues, including all K points (speed, altitude, G's)

All Items including upside down flights could be studied at the FI discretion along the overall progression

D) Aerobatics : (Study all manoeuvres with your FI)

Your FI will help you find and study all the relevant documentation and regulations, they are the prerequisites to start solo aerobatics flights so they will be studied during the first part of your syllabus, and any time you change your type of plane (for those related directly to the plane, ie 1 to 7):

1:Aircraft

Explanation and Revision of:

- a) Principle of Aerodynamics, flight manual and POH (Pilot Operational Handbook), Equipment and certification peculiarities for aerobatics aircraft, Fuel consumption, fuel systems and fuel quantities for each tank
- a Bis) Maintenance programme of your aerobatic plane
- b) Flight envelope/gust diagrams, Meaning of VA, VNE, VD, Maximum weight and balance in Alpha category. Consequences of over G's (written report and actions taken after over load), the Aging Process (cracks visible or not), Peculiarities of having the main landing gear attached to the main spar (hard landings), Airspeed limitations, Flutter consequences prevention, Effect of gusts on G loads
Engine management (Rpm, Maps, temperatures, oil pressure) and all limitations, Fixed vs variable pitch handling (notably Rpm overspeed in case of fixed pitch propeller).
- c) Ground Handling. Pre Flight Checks : Fuel (and smoke) levels and caps, spades, controls's hinges, condition of flight controls, fuselage and wing (top and under), rudder cables and rudder pedals adjustment system (if applicable), canopy condition (Jettison system if any), belts ***(Make sure no controls are still locked [Pilot seat or passenger seat] due to blocking of flight controls after mooring), check inside trim position related to trim outside position, check all seat adjustment locks are properly secured, check luggage and/or Storage compartments are empty*** and all specific points written in your POH prior to aerobatics
- d) Pilot equipment: Clothing : (Nomex flying suit, boots, gloves), sunglasses, headset or helmet, parachute (check the maintenance log book, the envelope of the chute, its use and storage)
- e) Boarding and rigging, (including passenger and passenger briefing - if applicable-). Aerobatics 5 points harness and safety buckle, proper adjustment of the seat and rudder pedals, Insure cockpit is clear and clean, no sand, no dust, FOD (Foreign Object Damage Prevention) Securing of passenger seat (if applicable), presence of a sickness bag. Study how to strap in according to your type of parachute and harness, adjusting to the proper distance needed to reach comfortably all the controls, and memorize it for next flights. Unboarding and postflight. Ground

Handling. Parking. Mooring. Canopy cover. Blocking of Flight Controls, nose into wind.

-f) Study the evacuation procedure on the ground (in case of fire), and in the air. Canopy Jettisson.

2) THE FLYING

Explanation and Revision of:

-g) Emergency procedures (Land with specific control problem, Restart in flight [loss of height]), Fire on board, How and when to evacuate an A/C, What to do in case of over G's in the Air)

-h) Physiologic effects on the body due to positive and negative aerobatic figures, (Airsickness, nausea, dizziness, use of sickness bag position and its storage). Then Study spatial disorientation, and how to prevent it, analyze situations when the grey, or black out could appear, as well as loss of consciousness, Back pain issues (how they could appear and how to prevent them (from extended inverted flight or negative G's or after long negative G's, in case of immediate positive G's)(tensioning of stomach muscles, breathing techniques),(release of stick back pressure. Recommended training and physical fitness, avoidance of incompatibilities with aerobatics, appropriate nutrition, rest and sleep, detrimental emotional or physical situations, study of the WADA list (anti doping)

-i) Regulations governing aerobatics, permanent or temporary training axis (Box), notams, local restrictions for noise abatement.

-j) Aerobatic axis, Height and space management. Maximum and minimum altitudes, length and width, center point. Altimeter setting in case of displaced aerobatic area. Entry parameters and sequencing manoeuvres. Situational awareness within the box and with respects to airfield/Base to warrant safe return. In case of engine failure, pilots must be prepared to land off base, and to sacrifice the aircraft in order to warrant a safe outcome.

-k) Premanoeuvring: Inflight safety checks (harness, engine, fuel tank) and inflight periodical 5 minutes safety check list (engine/ fuel level/ harness, monitoring airspace, monitoring of pilot physical aptitude)

-l) Monitoring from the ground, supervision by your AFI and later your trainer (specific vocabulary, orders, advises)

-m) Impact of density altitude, humidity and turbulences on the flight, Energy Management, speed and altitude (for both safety, and ability to fly the planned routine)

-n) Danger of clouds (what to do and when to do)

-o) «RISK» of the competition spirit which could push you beyond your own physical and a/c safety limits (Make sure you respect the POH limits, don't hesitate to regain altitude, learn the decision point (Energy gate) concept in order to understand when you will have to interrupt your sequence or the manoeuvre/figure). Make sure you always study and rehearse a new figure with your AFI first on the ground and then in the air, before he will sign you off to fly it/them solo under his own supervision.