

AMC1 SFCL.130 SPL – Training course and experience requirements

ED Decision 2020/004/R

THEORETICAL KNOWLEDGE INSTRUCTION FOR THE SPL

(a) General

The training should cover aspects related to non-technical skills in an integrated manner, taking into account the particular risks associated with the licence and the activity. The theoretical knowledge instruction provided by the declared training organisation (DTO) or approved training organisation (ATO) should include a certain element of formal classroom work but may also include other methods of delivery — for example, interactive video, slide or tape presentation, computer-based training and other media distance-learning courses. The training organisation responsible for the training has to check whether all the appropriate elements of the training course of theoretical knowledge instruction have been completed to a satisfactory standard before recommending the applicant for the examination.

(b) Syllabus

The following table contains the syllabus for theoretical knowledge instruction for the SPL:

1.	AIR LAW AND ATC PROCEDURES
1.1.	International law: conventions, agreements and organisations
1.2.	Airworthiness of aircraft
1.3.	Aircraft nationality and registration marks
1.4.	Personnel licensing
1.5.	Rules of the air
1.6.	Procedures for air navigation: aircraft operations
1.7.	Air traffic regulations: airspace structure
1.8.	Air traffic service (ATS) and air traffic management (ATM)
1.9.	Aeronautical information services (AIS)
1.10.	Aerodromes, external take-off sites
1.11.	Search and rescue
1.12.	Security
1.13.	Accident reporting
1.14.	National law
2.	HUMAN PERFORMANCE
2.1.	Human factors: basic concepts
2.2.	Basic aviation physiology and health maintenance
2.3.	Basic aviation psychology
2.4.	Use of oxygen
3.	METEOROLOGY
3.1.	The atmosphere
3.2.	Wind
3.3.	Thermodynamics
3.4.	Clouds and fog
3.5.	Precipitation
3.6.	Air masses and fronts
3.7.	Pressure systems
3.8.	Climatology

3.9.	Flight hazards
3.10.	Meteorological information
4.	COMMUNICATIONS
4.1.	Definitions
4.2.	VFR communications
4.2.1.	VFR communication at uncontrolled airfields
4.2.2.	VFR communication at controlled airfields
4.2.3.	VFR communication with ATC (en-route)
4.3.	General operating procedures
4.4.	Relevant weather information terms (VFR)
4.5.	Action required to be taken in case of communication failure
4.6.	Distress and urgency procedures
4.7.	General principles of VHF propagation and allocation of frequencies
5.	PRINCIPLES OF FLIGHT
5.1.	Aerodynamics (airflow)
5.2.	Flight mechanics
5.3.	Stability
5.4.	Control
5.5.	Limitations (load factor and manoeuvres)
5.6.	Stalling and spinning
5.7.	Spiral dive
6.	OPERATIONAL PROCEDURES
6.1.	General requirements
6.2.	Launch methods
6.3.	Soaring techniques
6.4.	Circuits and landing
6.5.	Outlanding
6.6.	Special operational procedures and hazards
6.7.	Emergency procedures
6.8.	Emergency parachute operation and landing
7.	FLIGHT PERFORMANCE AND PLANNING
7.1.	Mass and balance
7.2.	Speed polar of sailplanes or cruising speed
7.3.	Flight planning and task setting
7.4.	ICAO flight plan (ATS flight plan)
7.5.	Flight monitoring and in-flight re-planning
8.	AIRCRAFT GENERAL KNOWLEDGE, AIRFRAME AND SYSTEMS AND EMERGENCY EQUIPMENT
8.1.	Airframe
8.2.	System design, loads and stresses
8.3.	Landing gear, wheels, tyres and brakes
8.4.	Mass and balance
8.5.	Flight controls
8.6.	Instruments
8.7.	Rigging of aircraft, connection of control surfaces
8.8.	Manuals and documents

8.9.	Airworthiness and maintenance
8.10.	Airframe, engines and propellers
8.11	Water ballast systems
8.12	Batteries (performance and operational limitations)
8.13	Emergency parachutes
8.14	Emergency bail-out aid
9.	NAVIGATION
9.1.	Basics of navigation
9.2.	Magnetism and compasses
9.3.	Charts
9.4.	Dead reckoning navigation
9.5.	In-flight navigation
9.6.	Use of GNSS
9.7.	Use of ATS

AMC2 SFCL.130 SPL – Training course and experience requirements

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FLIGHT INSTRUCTION FOR THE SPL

(a) Entry to training

Before being accepted for training, an applicant should be informed that the appropriate medical certificate must be obtained before solo flying is permitted.

(b) Flight instruction — general

- (1) The SPL flight instruction syllabus should take into account the principles of threat and error management (TEM) and also cover:
 - (i) pre-flight operations, including verifying mass and balance, aircraft inspection and servicing, airspace and weather briefing;
 - (ii) rigging of sailplanes, including control surface connections;
 - (iii) aerodrome and traffic pattern operations, collision avoidance precautions and procedures;
 - (iv) control of the aircraft by external visual reference;
 - (v) flight at high angle of attack (critically low air speeds), recognition of, and recovery from, incipient and full stalls and spins;
 - (vi) flight at critically high air speeds, recognition of, and recovery from spiral dive;
 - (vii) normal and crosswind take-offs in respect of the different launch methods;
 - (viii) normal and crosswind landings;
 - (ix) short field landings and outlandings: field selection, circuit and landing hazards and precautions;
 - (x) cross-country flying using visual reference, dead reckoning and available navigation aids;

- (xi) soaring techniques as appropriate to site conditions;
 - (xii) emergency actions;
 - (xiii) considerations for soaring at high altitudes; and
 - (xiv) compliance with air traffic services procedures and communication procedures.
- (2) Before allowing applicants to undertake their first solo flight, the FI should ensure that they can operate the required systems and equipment.
- (c) Syllabus of flight instruction
- (1) The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore, the demonstrations and practices need not necessarily be given in the order listed. The actual order and content will depend upon the following interrelated factors:
- (i) the applicant's progress and ability;
 - (ii) the weather conditions affecting the flight;
 - (iii) the flight time available;
 - (iv) the instructional technique considerations;
 - (v) the local operating environment; and
 - (vi) the applicability of the exercises to the sailplane type.
- (2) At the discretion of the instructors, some of the exercises may be combined and some other exercises may be done in several flights.
- (3) At least, Exercises 1 to 12 have to be completed before the first solo flight.
- (4) Each of the exercises requires the applicant to be aware of the need for as well as the principles of good airmanship and look-out, which should be emphasised at all times.
- (5) List of exercises

Exercise 1: Familiarisation with the sailplane

- (i) characteristics of the sailplane;
- (ii) cockpit layout: instruments and equipment;
- (iii) flight controls: stick, pedals, airbrakes, flaps (if available) and trim;
- (iv) cable release and undercarriage; and
- (v) checklists, drills and controls.

Exercise 2: Emergency procedures

- (i) use of safety equipment (parachute);
- (ii) reaction to system failures and errors;
- (iii) bail-out procedure drills; and
- (iv) parachute landing fall drills.

Exercise 3: Preparation for flight

- (i) pre-flight briefings;
- (ii) required documents on board;
- (iii) equipment required for the intended flight;
- (iv) ground handling, rigging including connection of control surfaces, movements, tow out, parking and security;
- (v) pre-flight external and internal checks;
- (vi) verifying in-limits mass and balance;
- (vii) harness, seat or rudder pedal adjustments; and
- (viii) pre-launch checks.

Exercise 4: Initial air experience

- (i) area familiarisation; and
- (ii) look-out procedures.

Exercise 5: Effects of controls

- (i) look-out procedures;
- (ii) use of visual references;
- (iii) primary effects when laterally level and when banked;
- (iv) reference attitude and effect of elevator;
- (v) relationship between attitude and speed; and
- (vi) effects of:
 - (A) flaps (if available);
 - (B) airbrakes or spoilers (as applicable); and
 - (C) undercarriage (if available).

Exercise 6: Coordinated rolling to and from moderate angles of bank

- (i) look-out procedures;
- (ii) further effects of aileron (adverse yaw) and rudder (roll);
- (iii) coordination; and
- (iv) rolling to and from moderate angles of bank and return to straight flight.

Exercise 7: Straight flying

- (i) look-out procedures;
- (ii) maintaining straight flight;
- (iii) flight at critically high air speeds;
- (iv) demonstration of inherent longitudinal stability;

- (v) control of pitch, including use of trim;
- (vi) lateral level, direction and balance and trim; and
- (vii) air speed: monitoring and control.

Exercise 8: Turning

- (i) look-out procedures;
- (ii) demonstration and correction of adverse yaw;
- (iii) entry to turn (medium turns);
- (iv) stabilised turns;
- (v) exiting turns;
- (vi) faults in the turn (slipping, skidding and speed control);
- (vii) maintaining appropriate look-out procedures;
- (viii) turns on to selected headings and use of compass; and
- (ix) use of instruments (ball indicator or slip string) for precision.

Exercise 9a: Slow flight

Note: The objective is to improve the student's ability to recognise inadvertent flight at critically low speeds (high angle of attack) and to provide practice in maintaining the sailplane in a normal attitude at low speed.

- (i) safety checks;
- (ii) introduction to characteristics of slow flight; and
- (iii) controlled flight down to critically high angle of attack (slow air speed).

Exercise 9b: Stalling

- (i) safety checks;
- (ii) pre-stall symptoms, recognition and recovery;
- (iii) stall symptoms, recognition and recovery in straight flight and in turn;
- (iv) recovery when a wing drops;
- (v) approach to stall in the approach and in the landing configurations; and
- (vi) recognition and recovery from accelerated stalls.

Exercise 10: Recognition and avoidance of spins and spiral dives

- (i) safety checks;
- (ii) stalling and recovery at the incipient spin stage (stall with un-commanded roll/wing drop to about 45 ° and associated yaw);
- (iii) recognition of entry into fully developed spins;
- (iv) recognition of full spins;

- (v) standard spin recovery;
- (vi) instructor induced distractions during the spin entry;
- (vii) recognition of spiral dives;
- (viii) spiral dive recovery; and
- (ix) differentiation between spins and spiral dives.

Note: Consideration of manoeuvre limitations and the need to refer to the sailplane manual and mass and balance calculations.

Note (Exercises 11a to 11e): At least one launch method must be taught containing all the subjects below. A briefing that follows TEM principles should be conducted before every launch.

Exercise 11a: Winch launch

- (i) signals or communication before and during launch;
- (ii) use of the launching equipment;
- (iii) pre-take-off checks;
- (iv) into wind take-off;
- (v) crosswind take-off;
- (vi) safe and adequate profile of winch launch and limitations;
- (vii) release procedures; and
- (viii) launch failure procedures, simulated during the winch launch.

Exercise 11b: Aero tow

- (i) signals or communication before and during launch;
- (ii) use of the launch equipment;
- (iii) pre-take-off checks;
- (iv) into wind take-off;
- (v) crosswind take-off;
- (vi) on tow: straight flight, turning and slip stream;
- (vii) out of position in tow and recovery;
- (viii) descending on tow (towing aircraft and sailplane);
- (ix) release procedures; and
- (x) launch failure and abandonment, simulated by releasing the cable at a suitable height, with and without response to a signal from the tow plane.

Exercise 11c: Self-launch

- (i) review of the flight manual for the sailplane used;

- (ii) engine extending and retraction procedures;
- (iii) engine starting and safety precautions;
- (iv) pre-take-off checks;
- (v) in-flight engine start checks;
- (vi) noise abatement procedures;
- (vii) checks during and after take-off;
- (viii) into wind take-off;
- (ix) crosswind take-off;
- (x) power failures and procedures;
- (xi) abandoned take-off;
- (xii) maximum performance (short field and obstacle clearance) take-off;
- (xiii) short field take-off, soft field procedure or techniques and performance calculations;
- (xiv) in-flight retraction of engine and engine cooling;
- (xv) propeller drag;
- (xvi) effects of reduction and increase of power;
- (xvii) pitch nose-up tendency in case of engine shutdown (in case of over-wing propeller installation);
- (xviii) approach with extended retractable engine inoperative (may be simulated by extended airbrakes);
- (xix) decision process and reasons to terminate the soaring flight and to switch to powered flight; and
- (xx) decision process and reasons for not starting the engine and to end the flight as a non-powered sailplane.

Exercise 11d: Car launch

- (i) signals before and during launch;
- (ii) use of the launch equipment;
- (iii) pre-take-off checks;
- (iv) into wind take-off;
- (v) crosswind take-off;
- (vi) safe and adequate launch profile and limitations;
- (vii) release procedures; and
- (viii) launch failure procedures.

Exercise 11e: Bungee launch

- (i) signals before and during launch;
- (ii) use of the launch equipment;
- (iii) pre-take-off checks; and
- (iv) into wind take-off.

Exercise 12: Circuit, approach and landing

- (i) procedures for rejoining the circuit;
- (ii) collision avoidance, look-out techniques and procedures;
- (iii) pre-landing checks: circuit procedures, downwind and base leg;
- (iv) effect of wind and wind shear on approach and touchdown speeds;
- (v) use of flaps (if applicable);
- (vi) visualisation of an aiming point;
- (vii) approach control and use of airbrakes;
- (viii) normal and crosswind approach and landing; and
- (ix) short landing procedures or techniques.

Exercise 13: First solo flight

- (i) instructor's briefing including limitations;
- (ii) awareness of local area and restrictions;
- (iii) use of required equipment;
- (iv) effects of the centre of gravity (CG) on controllability of sailplane; and
- (v) observation of flight and debriefing by instructor.

Exercise 14: Advanced turning

- (i) steep turns (45 ° or more);
- (ii) stalling and spin avoidance in the turn and recovery; and
- (iii) recoveries from unusual attitudes, including spiral dives.

Note (exercises 15a to 15c): At least one of the three soaring techniques must be taught containing all subjects below.

Exercise 15a: Thermalling

- (i) look-out procedures;
- (ii) detection and recognition of thermals;
- (iii) use of audio soaring instruments;

- (iv) joining a thermal and giving way;
- (v) flying in close proximity to other sailplanes;
- (vi) centring in thermals;
- (vii) leaving thermals; and
- (viii) considerations for use of oxygen.

Exercise 15b: Ridge flying

- (i) look-out procedures;
- (ii) practical application of ridge flying rules;
- (iii) optimisation of flight path;
- (iv) speed control;
- (v) wind shear; and
- (vi) considerations for change of turning radius at same indicated airspeed at different altitudes.

Exercise 15c: Wave flying

- (i) look-out procedures;
- (ii) considerations and techniques for wave access and exit;
- (iii) speed limitations with increasing height; and
- (iv) considerations for use of oxygen.

Exercise 16: Out-landings

- (i) gliding range;
- (ii) restart procedures (only for self-launching and self-sustaining sailplanes);
- (iii) decision process to not start the engine and to outland;
- (iv) selection of landing area;
- (v) circuit judgement and key positions;
- (vi) circuit and approach procedures;
- (vii) actions after landing;
- (viii) determination of wind direction;
- (ix) selection of landing direction; and
- (x) considerations for landing at high slope landing sites.

Note (exercises 17a to 17c): If the required cross-country flight will be conducted as a solo cross-country flight, all the subjects below must be taught before.

Exercise 17a: Flight planning

- (i) weather forecast and actuals;
- (ii) notices to airmen (NOTAMs) and airspace considerations;
- (iii) map selection and preparation;
- (iv) route planning;
- (v) radio frequencies (if applicable);
- (vi) pre-flight administrative procedure, including preparation of additional required equipment, as applicable (e.g. life vest, personal locator beacon);
- (vii) ICAO flight plan where required;
- (viii) mass and performance;
- (ix) mass and balance;
- (x) alternate aerodromes and landing areas; and
- (xi) safety altitudes.

Exercise 17b: In-flight navigation

- (i) maintaining track and re-routing considerations;
- (ii) use of radio and phraseology (if applicable);
- (iii) in-flight planning;
- (iv) procedures for transiting regulated airspace or ATC liaison where required;
- (v) uncertainty of position procedure;
- (vi) lost procedure;
- (vii) use of additional equipment where required; and
- (viii) joining, arrival and circuit procedures at remote aerodrome.

Exercise 17c: Cross-country techniques

- (i) look-out procedures;
- (ii) maximising potential cross-country performance; and
- (iii) risk reduction and threat reaction.

AMC3 SFCL.130 SPL – Training course and experience requirements*ED Decision 2020/004/R***TRAINING ELEMENTS FOR THE INITIAL ISSUE OF AN SPL WITH TMG PRIVILEGES**

For initial SPL training that includes training for TMG privileges, the theoretical knowledge instruction and flight instruction should include the elements specified in points (b) and (c) of AMC1 SFCL.150(b).