

The Honourable Company of Air Pilots



PPL(A) Training Programme SEP/TMG

AltMoC1.FCL.210;215

Validated by the UK CAA



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EU PPL(A) Flight Training Programme

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Introduction

This document provides Training Organisations with a basic programme to complete a syllabus of training for the issue of an EU PPL(A) with SEP or TMG rating. The Lesson Plans produced by the Honourable Company of Air Pilots provide expanded guidance for those instructors using this programme.

The programme forms a coherent series of airborne and ground lessons which fully meet the EU PPL(A) syllabus requirements in Part-FCL. Specific references are given in the programme to Alt MoC1 to FCL.210 and 215, but completing the lessons as programmed also completes the syllabus listed at AMC1 to FCL.210 and 215.

Local procedures and individual training needs will affect the time required to complete individual exercises, and it should be noted that the total number of hours suggested in the programme do not add up to the minimum hours required to complete the PPL course, to provide some flexibility. Any additional hours required to meet the minimum 45 flying hours requirement can be flown as additional dual training, solo experience or a combination of the two.

The variables of aircraft class and type, student ability, local airspace considerations and weather will ultimately dictate the teaching methods, the construction of each flight lesson, the time taken and the exact order of events.

This training programme is based on the following assumptions:

- I. The student has good aptitude and natural ability and will be conducting the training on a regular basis.
- II. The aircraft is a simple single engine aeroplane, with a fixed pitch propeller, carburetted engine with manual mixture control, fixed undercarriage and basic avionics.
- III. The training aerodrome is outside controlled airspace with an Air Traffic Service available.
- IV. Controlled airspace and other suitable airfields with and without ATC/RADAR are located nearby for training purposes.

If the facilities of the training organisation differ from the above, adjustments to the lessons should be incorporated to provide effective training for the student.

Programme Structure

The programme is divided into three phases. The first phase provides all the fundamental flying and theoretical knowledge exercises required prior to teaching circuit procedures and landing. The second phase builds theoretical knowledge and includes the circuit training, first solo, and circuit consolidation exercises as well as refreshing stall avoidance techniques. The third phase includes instrument training, navigation and the other more advanced TK, handling and safety exercises required before Skill Test. Normally, each phase of training should be completed, and the aims of each lesson in that phase achieved, before embarking on the next phase.

Progress Checks

There are no formal progress checks included in this training programme. Where the instruction is provided primarily by an FI (A) subject to the requirement to be supervised, it is recommended that the student flies with an FI with the supervisory restriction removed prior to that instructor authorising either a first solo flight or a first solo cross-country flight.

Pre-Entry Requirements:

There are no pre-entry requirements for a student to undertake the EU PPL(A) training course. The following points should be noted and applied where applicable:

A student pilot shall not fly solo unless specifically authorised and supervised by a flight instructor. (Part FCL.020 refers).

Before first solo flight, a pilot shall be at least 16 years of age (Part FCL 020), and hold at least a Class 2 medical certificate. (Part-MED.A.030 & AMC1 to Part-FCL 210.a)

Credits for Previous Experience

When a student already holds a flying licence, credit may be given towards the minimum hours needed for the issue of an EU PPL. The precise nature of the credit is wholly dependent on the type of licence and the allowances as stated in PART-FCL210.a.

Where a course of flying training towards the EU PPL (A) has been partially completed at another ATO or DTO the training records for that training must be obtained from the previous training organisation. An assessment should then be made to ascertain which of the syllabus requirements have been achieved and therefore which lessons within this programme have been completed.

The needs of students with previous experience should be assessed by a senior member of the instructional staff and any credit applied and/or lessons already completed should be annotated accordingly on their progress sheets.

Theoretical Knowledge Training

For issue of an EU PPL (A) the student must pass the theoretical knowledge (TK) exams as stated in Part-FCL.025 & Part-FCL.215.

Unless the student has already completed a TK course, ground instruction should be integrated with the flying exercises as detailed in this document. The TK lessons are grouped in the programme, but it is intended that individual lessons should be given earlier as opportunity arises. Each group of TK lessons should be completed before moving onto a later flight lesson. Weather and other considerations such as student background may change the order or timing of the lessons, but a satisfactory standard should have been achieved in each listed ground subject before the student undertakes the solo exercises detailed as “check points”.

During Phases 1 and 2 prior to first solo flight, ground instruction should be completed on Air Law and Communications, and the student should demonstrate a satisfactory level of knowledge of these subjects by passing either the PPL Theoretical Knowledge examinations or an internal test to the same standard.

During Phase 3, all ground instruction should be completed. The student should demonstrate satisfactory knowledge of Operational Procedures, Meteorology, and Human Performance, before flying solo outside the circuit, a satisfactory knowledge of Navigation before solo navigation exercises, and knowledge of Flight Performance and Planning before the solo qualifying cross-country. Again an internal test may demonstrate that standard, but the student must have passed all TK examinations before being recommended for Skill Test.

Theoretical Knowledge lessons are programmed as formal classroom work, but some may be provided by interactive video, slide or tape presentation, computer based training, or other media distance learning courses. This instruction need not be provided by the same ATO who conducts the flight training programme.

Threat & Error Management

The philosophy of Threat & Error Management should be applied and taught throughout the course in conjunction with the DTO's basic Safety Management System (SMS). At the beginning of each phase of the training programme a list of potential Threats, Errors and Mitigations/Undesired Aircraft States is given relevant to that phase. Within each lesson plan, specific Threats and/or Errors particular to that lesson are specified for consideration & discussion.

The array below summarises the threats and human errors that are always present, note that this list should not to be taken as exhaustive. These threats & errors are assessed using the tables listed after the array; the Risk Severity table (3.5.1.2) and the Risk Likelihood table (3.5.2.2) and are summarised by reference to the Risk Tolerability Table (3.5.4). The scale used is ranged 1–5. The number entered into the 'Risk' column of the array below is the result following mitigation not the original value that may have been given to the threat or error. This methodology shows how TEM can effectively reduce the risk to an acceptable level by appropriate mitigation techniques and procedures. The "Lesson Input" column of the array suggests appropriate lessons where teaching of the particular TEM element from the array may be considered.

After each lesson TEM teaching & learning can be enhanced if both instructor and student take a few minutes to reconsider what threats, errors and/or undesired aircraft states were encountered during the lesson. Discussion may be useful to consider how well they were managed and what could have been done differently to improve the management of those threats and errors.

Where appropriate a safety report, as part of the SMS may be a useful method of sharing the experiences with others within the organisation.

In addition, instructors should, whenever possible during the course, use unplanned threats or errors (simulated if necessary), to allow the student to develop decision making skills.

Threat	Consequence	Mitigation	Error	Consequence	Mitigation	Risk: 1 -5	Lesson input
Uncontrolled flight and operations.	Taxiing collision. Deviation from flight profile: CAS bust & CFIT	Determine PIC: who has control and when.	Failure to establish the Pilot in Command; failure to recognise: control input confusion / no one has control	Conflicting control inputs leading to loss of controlled flight/taxi.	Ensure who is PIC and when: Control handover procedures: Verbalise: "I have control", "you have control"	5 reduced 1	All
Other aircraft	Collision / loss of control while avoiding	LOOKOUT: Correct scanning techniques. Left/right and above/below. Weaving and clearing turns. CLOCK CODE	Rushed & incomplete scan. Eye blind spots/visual field limits. Failure to recognise closing flight paths & speeds. Poor communications	Conflict aircraft unseen. Avoiding action too late.	Training to understand the limitations of sight & training in collision avoidance procedures & techniques. Skills in clear articulate communications.	5 reduced 2	All
Un-forecast winds, Weather/low cloud and poor visibility.	CFIT, breach of CAS, Becoming lost. Fuel exhaustion.	MAP READING skills. Flight planning; Safe altitude. Heading & Time, Positive fixes. Magnetic compass checks. Lost procedures. Radio aids and GPS skills. Minimum safe Operating Altitude	Poor flight planning. Incorrect reading of the map; Misidentification of features, Compass alignment & reading errors. Incorrect use of radio aids/GPS. Work rate overload	Entry into cloud. Disorientation; spatial/situational awareness lost - unsure of position. Degradation of confidence. Natural senses unreliable. Overload. CFIT	Continuous Lookout; situation/spatial awareness skills. Use of ATS. Priority of actions: aviate, navigate – communicate. Trust instruments.	5 reduced 2	EX 6 -10, EX 18
Airframe Structure and component Overstress	Airframe/ Component failure.	Aircraft maintenance schedule. Flight time limits: Inspection, servicing and replacement. Vne, Vno Va & Vfe	No/ poor pre-flight inspection. Unrecognised flight Limits. Exceeding VNE. Operation of flap/gear outside limits.	Miss-diagnosis. Incorrect response causing further alarm & confusion..	Understand PIC responsibilities. Check A. Documentation & checklist. Knowledge of aircraft limitations.	5 reduced 1	All
Exceed engine limits	Engine failure. Engine malfunction	FREDA, Engine management; Monitor; Power/Prop limits, mixture, Oil Ts & Ps	Failure to undertake, understand & monitor instruments & gauges. No routine checks.	Forced landing or unplanned diversion	FREDA, Climb/descent pre-entry checks	4 reduced 2	All

Continued..

Carburettor icing.	Engine failure/loss of power	FREDA checks. Identify ice/no ice.	Complacency: failure to ensure ice not present or eradicated. Icing undetected. No routine check.	Engine failure/loss of power. Work overload.	Applying Carb. Ht: from indications check to identify ice present. Allow Sufficient time for heat to purge ice.	4 reduced 2	All
Engine malfunction/failure	Reduced/total loss of power	Pre-flight and power checks. FREDA checks. Engine instruments monitored, mixture settings and temperatures managed. Forced landing drills.	Rushed or skimmed pre-flight check. Oil dipstick unsecured. Power checks rushed or not completed. Failure to complete FREDA. Miss-management of mixture or temperatures. Forced landing procedures not followed.	Unable to maintain height. Forced landing: Loss of control, poor landing site selection. Severe damage, personal injury/fatal	Know and follow checks. Actually check – not just a routine. Refer to engineer ANY faults found prior to flight. Report post flight. In-flight malfunction; more likely to be action / inaction by the pilot – double check.	5 reduced 3	EX16/17
The intended/unintentional Stall/spin	Potential for loss of control. Impact with the surface.	HASELL checks. Recovery techniques. Weight & balance Calculations.	Loose items in cockpit: incapacitate crew / restriction of controls. Insufficient height to recover from stall.	Jammed controls. Loss of control. Loss of Spatial & situational awareness. Serious injury/fatal	HASELL, Pre-stall/stall recognition signs. Identification. Terrain clearance. Power and speed maintenance. Stall avoidance /recovery	5 reduced 3	Ex 10/11
Propellers	Serious injury/fatal	Propeller handling. Stationary & rotating. Magnetos earthed (off). Mixture fully lean. Electric master off. Brakes and chocks.	Failure to follow propeller pre-handling procedures and poor/ no passenger safety brief given. Failure to ensure area clear of personnel and obstructions.	Serious injury/fatal. Propeller damage. Engine shock loaded.	Ensure area clear around aircraft pre-flight. Brief passengers regarding dangers and apron conduct. Ensure taxi path clear.	5 reduced 2	EX 1-5
Surface obstructions / taxiing/parked aircraft	Collision with other aircraft and surface obstructions.	Ensure area clear to taxi. Brakes checked immediately on taxiing. Controlled taxi speed. Maintain centre line markings.	Failure to check brakes. Taxiing too fast. Not maintaining centre lines. “Squeezing” between aircraft. Poor communications	Collision. Departure from taxiways. Ground loop/tip onto propeller following heavy braking.	Ensure taxi path clear. Brakes checked immediately after commencement of taxi. Weaving turns. Good communications.	4 reduced 1	Ex 1- 5

3.5.1.2 Risk severity should be defined in accordance with the following table.

SEVERITY OF CONSEQUENCES		
Definition	Meaning	Value
Catastrophic	Results in an accident, death or equipment destroyed	5
Hazardous	Serious injury or major equipment damage	4
Major	Serious incident or injury	3
Minor	Results in a minor incident	2
Negligible	Nuisance of little consequence	1

3.5.2.2 Risk likelihood should be defined in accordance with the following table:

LIKELIHOOD OF OCCURRENCE		
Definition	Meaning	Value
Frequent	Likely to occur many times	5
Occasional	Likely to occur sometimes	4
Remote	Unlikely to occur but possible	3
Improbable	Very unlikely to occur	2
Extremely Improbable	Almost inconceivable that the event will occur	1

3.5.4 Risk Tolerability Matrix

The tolerability of an individual risk is determined by use of the following Risk Matrix:

Risk Likelihood	Risk Severity				
	Catastrophic 5	Hazardous 4	Major 3	Minor 2	Negligible 1
Frequent 5	Unacceptable	Unacceptable	Unacceptable	Review	Review
Occasional 4	Unacceptable	Unacceptable	Review	Review	Review
Remote 3	Unacceptable	Review	Review	Review	Acceptable
Improbable 2	Review	Review	Review	Acceptable	Acceptable
Extremely Improbable 1	Review	Acceptable	Acceptable	Acceptable	Acceptable



Phase 1 – Basic Handling and Stalling

Lessons 1 to 9 (Syllabus Exercises 1 to 10b inclusive) should be completed to a competent standard before progressing to Phase 2.

Theoretical Knowledge

If the student has not completed the theoretical knowledge examinations before starting flying training, the pre-flight briefings during phase 1 should complement the TK lessons on Principles of Flight. Other briefings and debriefings should introduce elements of the other subjects, and reinforce the formal TK instruction on Air Law and Communications.

Threat and error management

In addition to those suggested as specific to individual lessons, the threats, errors and undesired aircraft states listed below may affect flight during most of the phase and suitable mitigations should be considered and applied.

THREATS

Other aircraft
Cockpit blind spots
Loss of bearings
Unfamiliar surroundings
System/Engine problems
Weather conditions
Controlled Airspace in the vicinity
Carburettor ice

ERRORS

Use of flap at high speed
Flap misuse
Exceeding engine limits
Descending too low
Insufficient height to recover from practise stall/spin exercises

UNDESIRE AIRCRAFT STATES

Engine overheating
Loose items in cockpit during practise stalling

The following items should also be covered in pre-flight briefings if appropriate to the aircraft class or type. Suggested lessons for their inclusion are given below, but the exact timing will depend on various factors. The dates the items are covered should be included in the student's records.

Pre-flight

1. Administration ([Ideally on Lesson2](#))
2. External checks ([Lesson2](#))
3. Cockpit preparation ([Lesson2](#))
4. Use of ventilation and heating controls ([Lesson2](#))
5. Use of check list ([Lesson2](#))
6. Starting procedures and warm up ([Lesson2](#))
7. Taxi procedures
8. Use of radio
9. Power checks/pre take off checks ([Lesson3](#))
10. Normal take off
11. Engine fire on the ground ([Lesson4](#))
12. Steering failure ([Lesson5](#))
13. Brake failure ([Lesson5](#))
14. Passenger and pre take-off brief
15. Cabin fire ([Lesson7](#))
16. Electrical fire ([Lesson7](#))
17. Smoke in the cockpit

Inflight

1. Approach checks ([Lesson4](#))
2. Arrival procedures ([Lesson4](#))
3. Map orientation/reading ([Lesson4](#))
4. Landing ([Lesson6](#))
5. After landing checks ([Lesson4](#))
6. Alternator/generator failure
7. Loss of fuel pressure
8. Loss of oil pressure
9. High oil temperature
10. Engine fire in the air ([Lesson6](#))

Post Flight

1. Shutting down ([Lesson3](#))
2. Administration ([Lesson3](#))

AIR SYLLABUS CHECK LIST – Ref: Alt MoC1.FCL.210

AMC Alt MoC1 Ref.	Exercise
Ex 1a Aircraft Familiarisation	<ul style="list-style-type: none"> (a) Aircraft construction and characteristics (b) Normal exits (c) Cockpit layout (d) Aircraft systems (e) Use of the checklist and Pilot Operating Handbook/ Aircraft Flight Manual
Ex 1e Emergency and Abnormal Procedures	<ul style="list-style-type: none"> (a) Fire on the ground (b) Cockpit fire in the air (c) Engine fire in the air (d) Systems failures (e) Emergency equipment and drills, emergency exits
Ex 2 Preparations for flight and action after flight	<ul style="list-style-type: none"> (a) Personal preparation (b) Flying equipment required (c) Weather forecasts and actual reports (d) NOTAMs and AIS information (e) Flight authorisation, aircraft serviceability and acceptance (f) Booking-out procedures (g) Airfield sense (h) Refuelling procedures (i) External checks (j) Internal checks (k) Seat, harness and rudder adjustment (l) Starting (m) Power and pre take off checks (n) Local procedures (o) Closing down checks (p) Parking, moving, security and tie down
Ex 3 Air Experience	The air experience flight
Ex 4 Effects of Controls	<ul style="list-style-type: none"> (a) Primary effects of the flying controls (b) Further effects of the flying controls (c) Effect of air speed (e) Effect of propeller slipstream (f) Effect of power (g) Effect of trimming controls (h) Effect of flaps (i) Effect of other controls (as applicable) (j) Operation of the carburettor heat control (as applicable) (k) Operation of the mixture control (as applicable) (l) Operation of the cockpit heating and ventilation controls (as applicable) (m) Operation of other controls (as applicable)

Ex 5a Taxiing	<ul style="list-style-type: none"> (a) Pre taxi checks (b) Moving off, speed control and stopping (c) Engine handling (d) Control of direction (e) Parking area procedures, taxiing in confined spaces (f) Effect of wind and use of the flying controls (g) Effects of ground surface (h) Rudder check (i) Instrument checks (j) Apron and manoeuvring area markings (k) Marshalling signals (l) ATC procedures
Ex 5e Taxiing Emergency & Abnormal procedures	<ul style="list-style-type: none"> (a) Steering failure (b) Brake failure (c) Emergency stop
Ex 6 Straight and level flight	<ul style="list-style-type: none"> (a) Lookout technique (b) Attaining and maintaining straight and level flight (c) Demonstration of stability (d) Straight and level flight at an increased airspeed (e) Straight and level flight at a decreased airspeed (f) Maintaining straight and level flight during configuration changes
Ex 7 Climbing	<ul style="list-style-type: none"> (a) Entering the climb (b) Maintaining the climb (c) Levelling off at a selected level (d) Climbing with flap extended (e) The en route (cruise) climb (f) Maximum angle of climb
Ex 8 Descending	<ul style="list-style-type: none"> (a) Entering the descent (b) Maintaining the descent (c) Levelling off at a selected level (d) Descending with flap (or spoilers, airbrakes or speedbrakes, as applicable) (e) Descending with power (f) Descending with flap and power (g) The en route (cruise) descent (h) Sideslipping (i) Entering a climb from the descent (go-around)
Ex 9 Turning	<ul style="list-style-type: none"> (a) Entering the level turn (b) Maintaining the level turn (c) Returning to straight flight (d) The climbing turn (e) The descending turn (f) Turning onto selected headings
Ex 10a Slow flight	<ul style="list-style-type: none"> (a) Safety checks (b) Introduction to slow flight (c) Controlled flight slowing to critically slow airspeed (d) Coordinated use of controls at critically slow airspeed (e) Recovery from a critically slow airspeed

Ex 10b Stalling	<ul style="list-style-type: none"> (a) Safety checks (b) Symptoms and recognition of the stall (c) The clean stall and recovery without and with power (d) Stall recovery during a wing drop (e) The stall and recovery with power and/or flap (or spoilers, airbrakes or speedbrakes, as applicable) (f) The approach to stall and recovery in the approach configuration (g) The approach to stall and recovery in the landing configuration (h) The approach to stall and recovery in the take-off configuration (i) Stall and incipient stall and recovery in different configurations and various manoeuvres
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Theoretical Knowledge Syllabus

AMC ALT MoC1 FCL.215 ref:	Subjects
1. Air Law and ATC procedures	<p>(A) International Aviation Law</p> <ul style="list-style-type: none"> (1) International Civil Aviation Organisation (ICAO) (2) European Aviation Safety Agency (EASA) (3) National Aviation Authorities (NAA) <p>(B) European Rules of the Air</p> <ul style="list-style-type: none"> (1) Applicability and compliance (2) Pilot in command responsibilities (3) Pre flight actions (4) Avoidance of collisions & rights of way (5) Operation in the vicinity of an aerodrome <p>(C) Aerodromes</p> <ul style="list-style-type: none"> (1) Taxiway and runway signs and markings (2) Preventing runway Incursion (3) Other ground signals (4) Marshalling signals (5) Light signals <p>(D) Visual Meteorological Conditions (VMC) and Visual Flight Rules (VFR)</p> <ul style="list-style-type: none"> (1) Visual Meteorological Conditions (VMC) minima (2) Visual Flight Rules (VFR) (3) Minimum heights <p>(E) Airspace Classifications</p> <ul style="list-style-type: none"> (1) Classification of airspace (2) Controlled and notified airspace (3) Uncontrolled airspace (4) Radio Mandatory Zones (RMZ) (5) Transponder Mandatory Zones (TMZ) <p>(F) Altimeter Setting Procedures</p> <ul style="list-style-type: none"> (1) Height, altitude and flight level (2) VFR altimeter setting procedures <p>(G) Air Traffic Services</p> <ul style="list-style-type: none"> (1) Air Traffic Control Service (2) Flight Information Service (3) Alerting Service <p>(H) Aeronautical Information Service (AIS)</p> <ul style="list-style-type: none"> (1) Aeronautical Information Service (AIS) (2) Aeronautical Information Publication (AIP) (3) NOTAMs <p>(I) Urgency and Distress Procedures</p> <ul style="list-style-type: none"> (1) Urgency situation (2) Distress situation (3) Interception of civil aircraft <p>(J) Pilot Licensing</p> <ul style="list-style-type: none"> (1) Medical certificates (2) Private Pilot Licence (PPL) privileges (3) Light Aircraft Pilot Licence (LAPL) privileges (4) Class Rating (5) Type Rating (6) Other Ratings and certificates <p>(K) National Procedures</p> <p>National rules and procedures</p>

2. Human Performance	<p>(A) Basic Aviation Physiology</p> <ul style="list-style-type: none"> (1) Hypoxia (2) Hyperventilation (3) Vision and visual illusions (4) Lookout techniques (5) Hearing and balance (6) Spatial disorientation (7) Sleep and fatigue (8) Common ailments, medication, health (9) Toxic hazards (10) Intoxication <p>(B) Basic Aviation Psychology</p> <ul style="list-style-type: none"> (1) Perception (2) Memory (3) Arousal and performance (4) Stress and stress management (5) Personality types (6) Hazardous attitudes <p>(C) Principles of Threat and Error Management</p> <ul style="list-style-type: none"> (1) Threats (2) Errors (3) Undesired aircraft states (4) Countermeasures (5) Situational awareness (6) Decision making (7) Developing sound judgement
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3. Meteorology

(A) The Atmosphere

- (1) Composition of the atmosphere
- (2) The troposphere

(B) Temperature, Pressure and Density

- (1) Temperature variation in the atmosphere
- (2) Pressure variation in the atmosphere
- (3) Density
- (4) Humidity
- (5) The International Standard Atmosphere (ISA)

(C) Altimetry

- (1) Altimeter and pressure settings
- (2) Altimeter temperature and pressure effects

(D) Wind

- (1) Cause of wind
- (2) Variation of wind velocity with altitude
- (3) Local winds

(E) Clouds and Precipitation

- (1) Formation of cloud
- (2) Principle cloud types
- (3) Precipitation

(F) Visibility

- (1) Fog and mist
- (2) Haze and smoke
- (3) Visibility in precipitation

(G) Air Masses

Characteristics of air masses

(H) Low Pressure Systems

- (1) The warm sector depression
- (2) The warm front
- (3) The cold front
- (4) Occluded fronts
- (5) Troughs and convergence

(I) High Pressure Systems

- (1) Anticyclones
- (2) Ridges
- (3) Cols

(J) Hazardous Weather Conditions: Icing

- (1) Airframe icing
- (2) Rain ice
- (3) Frost
- (4) Piston engine icing

(K) Hazardous Weather Conditions: Thunderstorms

- (1) Formation of thunderstorms
- (2) Hazards for aircraft

(L) Other Hazardous Weather Conditions:

- (1) Mountainous areas
- (2) Turbulence
- (3) Wind shear
- (4) Strong winds

(M) Meteorological Information

- (1) Synoptic charts
- (2) Satellite imagery
- (3) Ground based weather radar
- (4) Area and significant weather forecasts
- (5) TAFs and METARs
- (6) Sources of meteorological information

Forecast and observation parameters and tolerances

(N) National Procedures

National procedures

4. Communications	<p>(A) VHF Radio Broadcast Factors affecting VHF radio range</p> <p>(B) Transmission Technique (1) Transmission of letters (2) Transmission of numbers (3) Transmission of time (4) Call signs</p> <p>(C) VFR Communications Procedures (1) Test procedures (2) Standard phraseology (3) Items requiring read back (4) Transfer of communications (5) Transponder operating procedures</p> <p>(D) Weather Information (1) ATIS & VOLMET broadcasts, Flight Information Service (FIS)</p> <p>(E) Communications Failure Actions in the event of communication failure</p> <p>(F) Distress and Urgency Procedures (1) Emergency frequencies and facilities (2) Urgency procedures (3) Distress procedures</p> <p>(G) National Procedures National rules and procedures</p>
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5. Principles of Flight	<p>(A) Basic Concepts</p> <ul style="list-style-type: none"> (1) Static and dynamic pressure (2) Aerodynamic forces (3) Aerofoils and wings <p>(B) The Four Forces</p> <ul style="list-style-type: none"> (1) Weight (2) Thrust (3) Lift (4) Drag <p>(C) The Stall</p> <ul style="list-style-type: none"> (1) Stalling angle of attack (2) Factors affecting stall characteristics (3) Factors affecting stalling speed (4) Stall warning (5) Spin avoidance (6) Spinning characteristics <p>(D) Stability and Control</p> <ul style="list-style-type: none"> (1) Stability and control in yaw (2) Stability and control in roll (3) Stability and control in pitch (4) Trimming controls (5) High lift devices (6) Air brakes and spoilers (7) Other flying controls <p>(E) Principles of Flight</p> <ul style="list-style-type: none"> (1) Straight and level flight (2) Climbing (3) Descending (4) Turning and manoeuvring <p>(F) Operating Limitations</p> <ul style="list-style-type: none"> (1) Airspeed and load limitations (2) The load diagram (manoeuvring envelope) (3) Other operating limitations
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6. Operational procedures	<p>(A) Application of Threat and Error Management Application of Threat and Error Management (TEM) in relation to aircraft operation</p> <p>(B) Operation of Aircraft</p> <ol style="list-style-type: none"> (1) Applicability of EASA regulations (2) Responsibility and authority of Pilot in Command (PIC) (3) Documents to be carried (4) Dangerous goods (5) Fuel and oil, refuelling (6) Instruments and equipment (7) Safety equipment <p>(C) Avoidance of Hazards</p> <ol style="list-style-type: none"> (1) Avoiding hazardous situations (2) Avoidance of wake turbulence <p>(D) Search and Rescue Procedures</p> <ol style="list-style-type: none"> (1) Principles of search and rescue procedures (2) Search and rescue signals <p>(E) Accidents and Incidents</p> <ol style="list-style-type: none"> (1) Accident definitions and investigation (2) Safety reporting (3) Safety publications <p>(F) Care of Passengers Passenger briefing and passenger procedures</p> <p>(G) National Procedures National rules and procedures</p>
7. Flight performance and planning	<p>(A) Mass and Balance</p> <ol style="list-style-type: none"> (1) Mass limitations (2) Calculation of aircraft mass (3) Centre of gravity limitations (4) Calculation of centre of gravity <p>(B) Performance - Take-Off and Climb</p> <ol style="list-style-type: none"> (1) Factors affecting take-off and climb performance (2) Calculation of take-off and climb performance <p>(C) Performance - Cruise</p> <ol style="list-style-type: none"> (1) Principles of endurance and range (2) Factors affecting cruise performance (3) Calculation of cruise performance <p>(D) Performance - Descent and Landing</p> <ol style="list-style-type: none"> (1) Factors affecting descent and landing performance (2) Calculation of descent and landing performance <p>(E) VFR Flight Planning</p> <ol style="list-style-type: none"> (1) Route selection (2) Communication and radio navigation selection (3) Completion of the navigation plan (4) The Aeronautical Information Publication (AIP) (5) NOTAMs (6) Obtaining meteorological information (7) International flight <p>(F) Fuel Planning Fuel required calculation</p> <p>(G) ICAO (ATS) Flight Plan</p> <ol style="list-style-type: none"> (1) Requirement to File ICAO (ATS) Flight plan (2) Submission of the ICAO (ATS) Flight plan <p>(H) National Procedures National rules and procedures</p>

8. Aircraft General Knowledge

(A) The Airframe

- (1) Airframe design and construction
- (2) Serviceability checks

(B) Flying Controls

- (1) Flying control design and construction
- (2) Serviceability checks

(C) Undercarriage

- (1) Undercarriage design and construction
- (2) Tyres and brakes
- (3) Serviceability checks

(D) Piston Engines

- (1) Principles of operation
- (2) Piston engine design and components
- (3) Serviceability checks

(E) Piston Engine Systems

- (1) Fuel system
- (2) Induction system
- (3) Ignition system
- (4) Oil system
- (5) Cooling system
- (6) Other engine systems

(F) The Propeller

- (1) Principles of operation
- (2) Propeller design and components
- (3) Propeller handling
- (4) Serviceability checks

(G) Engine Handling

- (1) Engine limitations
- (2) Engine handling

(H) The Electrical System

- (1) Principles of operation
- (2) Electrical system design and components

(I) Instruments and Systems

- (1) The pitot static system
- (2) The altimeter
- (3) The vertical speed indicator
- (4) The air speed indicator
- (5) The suction system
- (6) Attitude indicator
- (7) Heading indicator
- (8) The turn indicator / turn co-ordinator
- (9) The compass
- (10) Other instrumentation
- (11) Integrated electronic displays

	<p>(J) Avionics Systems</p> <ul style="list-style-type: none"> (1) Communications Equipment (2) SSR (3) ADF (4) VOR (5) DME (6) GNSS (7) Integrated Electronic Displays <p>(K) Cockpit Equipment and Systems</p> <ul style="list-style-type: none"> (1) Doors, windows and exits (2) Seats (3) Seat belts and harnesses (4) Cockpit heating and ventilation systems <p>(L) Emergency Equipment</p> <ul style="list-style-type: none"> (1) First aid kit (2) Fire extinguishers (3) ELT/PLB (4) Lifejackets and life rafts (5) Other survival equipment <p>(M) Aircraft Airworthiness</p> <ul style="list-style-type: none"> (1) Aircraft registration (2) Airworthiness Certificate, Permit to Fly <p>(N) Aeroplane Flight Manual/Pilot Operating Handbook</p> <ul style="list-style-type: none"> (1) Aircraft maintenance and serviceability (2) Maintenance and serviceability documentation <p>(O) Converting Onto a Another Aircraft Type</p> <p>Practical considerations when converting onto a different aircraft and/or variants</p> <p>(P) National Procedures</p> <p>National rules and procedures</p>
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9. Navigation

(A) Form of the Earth

- (1) Latitude and Longitude

(B) Measurement of Direction

- (1) True direction
- (2) Magnetic direction
- (3) Compass direction

(C) Measurement of Distance

- (1) Units of distance
- (2) Conversion of units

(D) Measurement of Airspeed

- (1) Calculation of true airspeed

(E) Triangle of Velocities

- (1) Calculating heading and groundspeed

(F) In-flight VFR Navigation: Dead Reckoning and Map Reading

- (1) Principles of dead reckoning
- (2) Time and distance
- (3) Map reading

(G) In-flight VFR Navigation: Off-track and Diversion

- (1) Off track correction
- (2) ETA revision
- (3) Diversion
- (4) Alternate airfields

(H) In-flight VFR Navigation: Vertical Navigation

- (1) Safety altitudes
- (2) Vertical navigation
- (3) Altimeter settings

(I) In-flight VFR Navigation: Controlled and Notified Airspace

- (1) Procedures in the vicinity of controlled and notified airspace
- (2) Procedures within controlled and notified airspace
- (3) Airspace infringement

(J) Time

- (1) UTC
- (2) Time Zones
- (3) Sunrise and sunset information

(K) VFR Radio Navigation

- (1) Integrating radio navigation with VFR navigation
- (2) VDF – Operation and interpretation, limitations and accuracy
- (3) ATC Radar – Operation and interpretation, limitations and accuracy
- (4) ADF – Operation and interpretation, limitations and accuracy
- (5) VOR – Operation and interpretation, limitations and accuracy
- (6) DME – Operation and interpretation, limitations and accuracy
- (7) GNSS – operation and interpretation, limitations and accuracy

LESSON A1 – AIR EXPERIENCE

(DURATION 0:30)

Ref: Alt MoC1 Ex 1b (e), 3

Aim: To introduce the student to single engine piston or TMG flying.

Likely Threats, Errors and Undesired Aircraft States:

Not knowing who has control

PRE FLIGHT:

- Introduction to safety in and around the aircraft
- Emergency and evacuation brief
- Preparation for flight (basics only)
- Handover/ Takeover/Follow Through/Relax procedures

AIR EXERCISE:

- Aircraft familiarisation
- Demonstration of aircraft stability
- Introduction to attitude flying

LESSON A2 – EFFECTS OF CONTROLS 1

(0:45)

Ref: Alt MoC1 Ex 1a, 4, 5a

Aims:

1. To learn the effects of the primary controls.
2. To select, hold and trim to an attitude.

Likely Threats, Errors and Undesired Aircraft States:

Unfamiliar surroundings, Busy airspace

PRE FLIGHT:

- Pre-flight brief on Effects of Controls Part 1 (Ex 4)
- Pre-flight brief on Taxiing (Ex 5)

AIR EXERCISE:

- Datum attitude
- Primary effect of the:
 - Elevators
 - Ailerons
 - Rudder
- Effect and use of trim
- Effect of speed on the primary controls
- Effect of slipstream on the primary controls
- Further effect of the:
 - Elevators
 - Ailerons
 - Rudder
- Demo of adverse yaw and the need for co-ordinated use of controls when rolling
- Start, stop, steering and controlling speed during taxiing after landing.

STANDARD:

The student demonstrates the correct use of the requisite techniques to:

- ☐ Control the aircraft in all 3 axes
- ☐ Select and trim to an attitude
- ☐ Taxi the aircraft with guidance

LESSON A3 – EFFECTS OF CONTROLS 2

(0.45)

Ref: Alt MoC1 Ex4, 5a, 5e

Aim: To set an engine RPM and operate flaps/spoilers/airbrakes and supplementary controls whilst maintaining the datum attitude in trim.

Likely Threats, Errors and Undesired Aircraft States:

Exceeding flap limit, Exceeding engine limits, Brake/steering failure

PRE FLIGHT:

- Pre-flight brief on Effects of Controls Part 2 (Ex 4)
- Introduction to weather interpretation and NOTAM decoding

AIR EXERCISE:

- Revision of effects of controls part 1
- Use of throttle and the engine gauges
- Effect of power, speed and flap/spoiler/airbrake on the trimmed state
- Effect and use of flap/spoiler/airbrake
- Supplementary controls: Use of mixture and carb heat
- Set an engine RPM

STANDARD:

The student demonstrates the correct use of the requisite techniques to:

- ☐ Select & trim to any pitch attitude
- ☐ Maintain attitude & direction whilst changing power
- ☐ Maintain attitude & direction whilst operating flaps/spoilers/airbrakes
- ☐ Retrim following changes to power and flaps/spoilers/airbrakes
- ☐ Operate the ancillary controls

LESSON G1 – PRINCIPLES OF FLIGHT 1 (1.00)

Ref: Alt MoC1 TK 05.(A)

Basic Concepts

- (1) Static and dynamic pressure
- (2) Aerodynamic forces
- (3) Aerofoils and wings

LESSON G2 – PRINCIPLES OF FLIGHT 2 (2.00)

Ref: Alt MoC1 TK 05.(B)

The Four Forces

- (1) Weight
- (2) Thrust
- (3) Lift
- (4) Drag

LESSON G3 – PRINCIPLES OF FLIGHT 3 (2.00)

Ref: Alt MoC1 TK 05.(E)

Principles of Flight

- (1) Straight and level flight
- (2) Climbing
- (3) Descending
- (4) Turning and manoeuvring

LESSON G4 – COMMS 1 (1.00)

Ref: Alt MoC1 TK 02.(A)

VHF Radio Broadcast

Factors affecting VHF radio range

Transmission Technique

- (1) Transmission of letters
- (2) Transmission of numbers
- (3) Transmission of time
- (4) Call signs

LESSON G5 – COMMS 2 (1.30)

Ref: Alt MoC1 TK 02.(C)

VFR Communications Procedures

- (1) Test procedures
- (2) Standard phraseology
- (3) Items requiring read back
- (4) Transfer of communications
- (5) Transponder operating procedures

LESSON G6 – OPERATIONAL PROCEDURES 1 (0.30)

Ref: Alt MoC1 TK 06.(A)

Application of Threat and Error Management

Application of Threat and Error Management (TEM) in relation to aircraft operation

LESSON A4 – STRAIGHT AND LEVEL 1

(0:45)

Ref: Alt MoC1 Ex 6

Aim: To learn to fly straight and level, in balance and in trim, at a constant power setting

Likely Threats, Errors and Undesired Aircraft States:

System/Engine problems, Blind spots

PRE FLIGHT:

- Pre-flight brief on Straight & Level Part 1 (Ex 6)
- Weather and NOTAM brief

AIR EXERCISE:

- Revision of effects of controls
- Achieve straight flight
- Achieve level flight
- Achieve straight and level flight
- Demo gross and slight imbalance
- Lookout (scan technique)
- Maintenance of S & L – Cruise checks
- Correct to datums

STANDARD:

The student demonstrates a clear understanding of the principles of:

- ☐ Routine checks
- ☐ The need for a lookout scan technique

The student demonstrates the correct use of the requisite techniques to:

- ☐ Recover to and maintain balanced, S&L from attitude excursions
- ☐ Trim the aircraft
- ☐ Make small corrections to recover & maintain heading & altitude datum
- ☐ Carry out a lookout scan

LESSON A5 – STRAIGHT AND LEVEL 2

(1.00)

Ref: Alt MoC1 Ex 6, 10a & 12

Aim: To fly the aircraft straight and level at different power settings, speeds and with flap.

Likely Threats, Errors and Undesired Aircraft States:

Exceeding limiting speeds, Flying too slowly

PRE FLIGHT:

- Pre-flight brief on Take-off
- Pre-flight brief on Straight & Level Part 2 (Ex 6)
- Weather and NOTAM brief

AIR EXERCISE:

- Normal take-off
- Revision of straight and level 1
- Deceleration & acceleration
- Straight & level at different power settings and speeds
- Relate to best endurance and best range speeds
- Speed instability (slow flight)
- Straight & level with flaps
- Slow safe cruise

STANDARD:

The student demonstrates the correct use of the requisite techniques to:

- ☐ Maintain S&L when adjusting power
- ☐ Maintain S&L when changing speed
- ☐ Maintain S&L when changing configuration
- ☐ Retrim following changes
- ☐ Adopt slow safe cruise & return to normal cruise

LESSON A6 – CLIMBING & DESCENDING 1 AND MEDIUM LEVEL TURNS (1.15)

Ref: Alt MoC1 Ex7, 8 & 9

- Aims:**
1. To climb at best rate and level off at specified altitudes.
 2. To glide at best range speed
 3. To execute a level turn at 30° AOB and roll out on specific headings.

Likely Threats, Errors and Undesired Aircraft States:

Weather conditions, Incorrect altimeter pressure setting, Flap misuse, Engine overheating and excessive engine cooling

PRE FLIGHT:

- Pre-flight brief on Climbing (Ex 7) & Descending Part 1 (Ex 8)
- Pre-flight brief on Medium Level Turns (Ex 9)
- Weather and NOTAM brief

AIR EXERCISE:

- Take-off
- Revision of straight and level 2 – Achieve S & L at different IAS.
- Climb
 - a. Maintain the climb (inc. control of IAS and engine management)
 - b. Entry into the climb
 - c. Level off at specified altitudes
- Turns:
 - a. Maintain a medium level turn
 - b. Entry into a medium level turn
 - c. Roll out of a medium level turn
 - d. Roll out onto specific features/headings
- Descent:
 - a. Maintain the glide (inc. control of IAS and engine management)
 - b. Entry to the glide
 - c. Transition from glide to climb

STANDARD:

The student demonstrates the correct use of the requisite techniques to:

- ☐ Enter a climb and recover to S&L
- ☐ Enter the glide
- ☐ Maintain balance and heading in climb/descent
- ☐ Make transition from glide to climb
- ☐ Make a level turn, recovering by ref to landmarks
- ☐ Make a level turn, recovering onto specified headings

LESSON A7 – CLIMBING & DESCENDING 2

(1.15)

Ref: Alt MoC1 Ex 7 & 8

- Aims:
1. To learn the climb and descent techniques used in the circuit
 2. To fly a go-around.

Likely Threats, Errors and Undesired Aircraft States:

Weather conditions, Incorrect pressure setting, Flap/airbrake misuse, Excessive engine heating/cooling

PRE FLIGHT:

- Pre-flight brief on Climbing (Ex 7) & Descending Part 2 (Ex 8)
- Weather and NOTAM brief

AIR EXERCISE:

- Revision of climbing and descending Part 1
- Climbing turns and lookout technique
- Effect of flaps in the climb
- Effect of flaps in the glide
- Effect of power in the descent
- Descending turns
- Approach & landing configurations – control of descent
- Go around
- Demonstration stall and recovery

STANDARD:

The student demonstrates the correct use of the requisite techniques to:

- ☐ Carry out climbing turns
- ☐ Carry out descending turns
- ☐ Level off at pre-determined altitudes
- ☐ Descend in approach configuration
- ☐ Descend in landing configuration
- ☐ Perform a go round

LESSON G7 – PRINCIPLES OF FLIGHT 4

(2.00)

Ref: Alt MoC1 TK 05.(C)

The Stall

- (1) Stalling angle of attack
- (2) Factors affecting stall characteristics
- (3) Factors affecting stalling speed
- (4) Stall warning
- (5) Spin avoidance
- (6) Spinning characteristics

LESSON G8 – LAW 1

(1.30)

Ref: Alt MoC1 TK 01.(A) and (G)

International Aviation Law

- (1) International Civil Aviation Organisation (ICAO)
- (2) European Aviation Safety Agency (EASA)
- (3) National Aviation Authorities (NAA)

Air Traffic Services

- (1) Air Traffic Control Service
- (2) Flight Information Service
- (3) Alerting Service

LESSON G9 – LAW 2

(2.00)

Ref: Alt MoC1 TK 01.(B)

European Rules of the Air

- (1) Applicability and compliance
- (2) Pilot in command responsibilities
- (3) Pre flight actions
- (4) Avoidance of collisions & rights of way
- (5) Operation in the vicinity of an aerodrome

LESSON G10 – LAW 3

(1.00)

Ref: Alt MoC1 TK 01.(C)

Aerodromes

- (1) Taxiway and runway signs and markings
- (2) Preventing runway Incursion
- (3) Other ground signals
- (4) Marshalling signals
- (5) Light signals

LESSON G11 – OPERATIONAL PROCEDURES 2

(0.30)

Ref: Alt MoC1 TK 06.(C)

Avoidance of Hazards

- (1) Avoiding hazardous situations
- (2) Avoidance of wake turbulence

LESSON A8 – STALLING PART 1

(1.00)

Ref: Alt MoC1 Ex 10b

Aim: To learn to recognise and recover from the full and approaching stall.

Likely Threats, Errors and Undesired Aircraft States:

Unrecognised stall, Other aircraft, Incorrect configuration, Harness insecure, Loose objects, Engine failure

PRE FLIGHT:

- Pre-flight brief on Stalling Part 1 (Ex 10b)
- Weather and NOTAM brief

AIR EXERCISE:

- **Introduction to the stall:**
 - a. Demo / guide of HASELL and entry
 - b. Demo of full stall & recovery if not previously done.
- **Recognition of the stall:**
 - a. Signs of the approaching stall
 - b. Confirming buffet identification
 - c. Full stall features
- **Recovery from the stall:**
 - a. Recovery at incipient stage
 - b. Recovery without power
 - c. Standard Stall Recovery (SSR)
 - d. Cruise checks after stalling

STANDARD:

The student demonstrates a clear understanding of the principles of:

- ☐ Checks before stalling (HASELL)
- ☐ Standard Stall Recovery

The student recognises:

- ☐ Symptoms of the full stall
- ☐ Signs of the incipient stall

The student demonstrates the correct use of the requisite techniques to:

- ☐ Recover at the incipient stage (SSR)
- ☐ Recover from a full stall (SSR)
- ☐ Recover without power

LESSON A9 – STALLING PART 2

(1.00)

Ref: Alt MoC1 Ex 10b

- Aims:
1. To learn how flaps/spoilers/airbrakes & power affect stalling characteristics.
 2. To avoid stalling in the circuit.

Likely Threats, Errors and Undesired Aircraft States:

Unrecognised stall

When practising recoveries:

Other aircraft, Incorrect configuration, Harness insecure, Loose objects, Engine fails

PRE FLIGHT:

- Pre-flight brief on Stalling Part 2 (Ex 10b)
- Weather and NOTAM brief

AIR EXERCISE:

- Revise clean, power off stall recovering at incipient stage.
- **Stalling with power/flap/landing configuration:**
 - a. Effect of power on the stall
 - b. Effect of flap/spoilers/airbrakes on the stall and warnings
 - c. Full stall in landing configuration
- **Recovery from the stall at the incipient stage:**
 - a. Recovery at the incipient stage in landing configuration (simulated final approach)
 - b. Recovery at the incipient stage in the turn with approach configuration (simulated base to final turn)
 - c. Recovery at the incipient stage in the departure turn with and without take-off flap setting (simulated turn after take-off)
 - d. Cruise checks after stalling

STANDARD:

The student demonstrates a clear understanding of the principles of:

- The effect of power & flap/spoiler/airbrake on the stall

The student demonstrates the correct use of the requisite techniques to:

- ☐ Recover to a safe climb at the incipient stage of a stall in simulated final approach
- ☐ Recover to a safe climb at the incipient stage of a stall in simulated base to final turn
- ☐ Recover to a safe climb at the incipient stage of a stall in a simulated climbing turn after take off

LESSON G12 – LAW 4

(1.30)

Ref: Alt MoC1 TK 01.(D)

Visual Meteorological Conditions (VMC) and Visual Flight Rules (VFR)

- (1) Visual Meteorological Conditions (VMC) minima
- (2) Visual Flight Rules (VFR)
- (3) Minimum heights

LESSON G13 – LAW 5

(2.00)

Ref: Alt MoC1 TK 01.(E) & (I)

Airspace Classifications

- (1) Classification of airspace
- (2) Controlled and notified airspace
- (3) Uncontrolled airspace
- (4) Radio Mandatory Zones (RMZ)
- (5) Transponder Mandatory Zones (TMZ)

Urgency and Distress Procedures

- (1) Urgency situation
- (2) Distress situation
- (3) Interception of civil aircraft

LESSON G14 – MET 1

(2.00)

Ref: Alt MoC1 TK 03.(A) & (B)

The Atmosphere

- (1) Composition of the atmosphere
- (2) The troposphere

Temperature, Pressure and Density

- (1) Temperature variation in the atmosphere
- (2) Pressure variation in the atmosphere
- (3) Density
- (4) Humidity
- (5) The International Standard Atmosphere (ISA)

LESSON G15 – COMMS 3

(1.00)

Ref: Alt MoC1 TK 01.(D) & (E)

Weather Information

ATIS & VOLMET broadcasts, Flight Information Service (FIS)

Communications Failure

Actions in the event of communication failure

LESSON G16 – COMMS 4

(1.00)

Ref: Alt MoC1 TK 01.(F) & (G)

Distress and Urgency Procedures

- (1) Emergency frequencies and facilities
- (2) Urgency procedures
- (3) Distress procedures

National Procedures

National rules and procedures



Phase 2 – Circuits

This programme details only four “circuit sessions” to include EASA exercises 12 and 13 but the actual number of flights to achieve competence will vary.

Flapless and glide approaches and cross wind techniques are introduced prior to first solo but are covered in more detail later as part of circuit consolidation. Cross wind techniques should be covered whenever conditions are suitable.

Theoretical Knowledge

The pre-flight briefings and debriefings during Phase 2 should reinforce previous TK lessons and also introduce the student to basic Operating Procedures. A satisfactory knowledge of Aviation Law, and if appropriate Communications Procedures, must be demonstrated before solo flight.

Threat and Error Management

In addition to those suggested in individual lessons, the threats and errors below may affect flight in the circuit. Suitable mitigations should be considered and applied.

THREATS

Concentration of aircraft in the circuit
System/Engine problems
Insufficient runway performance

ERRORS

Unstable approach
Use of flap at high speed
Premature flap retraction
Repeatedly flying over populated areas
Lack of theoretical knowledge
Lack of medical fitness to fly solo

UNDESIRE AIRCRAFT STATES

Engine overheating

CIRCUIT EMERGENCIES

The student should be able to deal with all of the following prior to first solo.

1. Abandoned take-off
2. Engine failure after take-off
3. Partial engine failure after take-off
4. Missed landing and Go-around (bounce/balloon)
5. Missed approach
6. Radio failure

SYLLABUS CHECK LIST – EASA Ref: Alt MoC 1 FCL.210

AMC Alt MoC 1 Ref.	Exercise
Ex 10b Stalling	<ul style="list-style-type: none"> (a) Safety checks (c) The clean stall and recovery without and with power (d) Stall recovery during a wing drop (f) The approach to stall and recovery in the approach configuration (g) The approach to stall and recovery in the landing configuration (h) The approach to stall and recovery in the take-off configuration
Ex 12a Take-off and Climb	<ul style="list-style-type: none"> (a) Pre take-off checks (b) Checks during and after take-off and climb (c) Standard take off and initial climb (d) Crosswind take-off (e) Short field and soft field take off (f) Noise abatement (g) ATC procedures
Ex 12e Emergency and Abnormal procedures	<ul style="list-style-type: none"> (a) Abandoned take off (b) Engine failure after take-off
Ex 13a Circuit, approach and landing	<ul style="list-style-type: none"> (a) Joining the circuit (b) Circuit pattern and procedures (c) Pre landing checks (d) Initial approach to land (e) Normal (performance) landing (f) Touch and go (g) Effect of surface wind (h) Crosswind circuit, approach and landing (i) Glide approach and landing (j) Flapless approach and landing (k) Short field and soft field approach and landing (l) Missed approach and go around (m) Bad weather circuit and landing (n) Noise abatement (o) ATC procedures
Ex 13e Emergency and Abnormal procedures	<ul style="list-style-type: none"> (a) Engine failure in the circuit (b) Systems failures (c) Misjudged landing
Ex 14 First solo and solo consolidation	<ul style="list-style-type: none"> (a) First solo <p>During flights immediately following the solo circuit consolidation the following should be revised;</p> <ul style="list-style-type: none"> (b) Leaving the circuit (c) Local area procedures, map reading (d) Cruise checks (e) Use of the compass (f) Use of radio navigation aids for homing (g) Re joining the circuit

LESSON A10 - CIRCUITS

(1.00)

Ref: Alt MoC1 Ex 12,13

Aim: To fly a standard circuit pattern and make a normal landing

Likely Threats, Errors and Undesired Aircraft States:

Concentration of aircraft, Unstable approach

PRE FLIGHT:

- Pre-flight brief on the standard circuit and normal landing (Ex 12 & 13)
- Weather and NOTAM brief

AIR EXERCISE:

- Revise normal take-off, after take-off checks; drift correction, climb.
- Turn to downwind and downwind leg
 - Spacing from runway / other aircraft / drift correction
 - Reference points / RT Call
 - Pre-landing checks
- Base leg
 - Configuring the aircraft
 - Drift correction
 - Assessing rate of descent / flight path
 - Anticipation and technique for turn onto Final Approach
- Final Approach – if not stable go around
 - Control of approach path / Landing Configuration / Correct IAS
 - Clearance received (if appropriate)
 - Runway correct and clear
- Landing flare
 - Technique
 - Throttle/attitude control
- Ground roll - Use of flying controls and brakes
- Touch and Go procedures

STANDARD:

The student demonstrates the correct use of the requisite techniques to carry out:

- ☐ Pre-take-off and runway checks
- ☐ Normal take-off
- ☐ Climb upwind and crosswind
- ☐ Downwind leg
- ☐ Base leg
- ☐ Final Approach
- ☐ Stabilised Approach
- ☐ Landing flare
- ☐ Ground roll
- ☐ Touch and go
- ☐ Use of standard RT

LESSON A11 - CIRCUITS & EMERGENCIES

(1.00)

Ref: Alt MoC1 Ex 12, 13, 12e, 13e

Aims:

1. To continue practising the circuit.
2. To introduce circuit emergencies
3. To introduce glide approaches
4. To introduce approach without flap/spoiler/airbrake

Likely Threats, Errors and Undesired Aircraft States:

Flap failure, Engine malfunctions, Malfunction during T/O, Crosswind

PRE FLIGHT:

- Pre-flight brief on continuing practise of Ex12 and 13
- Pre flight brief on emergency procedures (Ex 12e & 13e)
- Weather and NOTAM brief

AIR EXERCISE:

Revise general circuit procedures

Engine failure after takeoff;

- Speed achievement and maintenance
- Field selection
- Crash drill

Approach without flap/spoiler/airbrake;

- Higher stall speed without flap = higher approach speed
- Difficulty in slowing down
- Extension of final approach
- Change to Approach Attitude
- Different flare
- Effect on Landing Distance Performance.

Academic glide approach;

- Judgement of touchdown point (point of constant reference)
- Undershoot/overshoot corrections – flap/spoiler/airbrake/turns/sideslip
- Speed control
- Pitch control
- Landing flare
- Circuit emergency(s) from overview (Ex 12e & 13e)

STANDARD:

The student demonstrates a clear understanding of the principles of:

- ☐ A flapless circuit & approach
- ☐ A glide circuit & approach
- ☐ Dealing with emergencies in the circuit

The student demonstrates the correct use of the requisite techniques to:

- ☐ Fly the standard circuit
- ☐ Make a safe landing
- ☐ Use standard RT

LESSON A12 – STALLING PART 3

(1.15)

Ref: Alt MoC1 Ex 10b, 12,13

- Aims:
1. To revise stall avoidance
 2. To practise circuit joining
 3. To continue practising circuits and landing

Likely Threats, Errors and Undesired Aircraft States:

As stalling 2 (lesson 9) and

Bounce on landing, Wake vortices, Aircraft joining the circuit, Insufficient spacing, Runway occupied

PRE FLIGHT:

- Pre-flight brief on Stalling Part 3 (Ex10b)
- Weather and NOTAM brief

AIR EXERCISE:

- Climb to a suitable area for stalling.
- **Revision of incipient recoveries:**
 - a. In the approach configuration (simulated turn from base to final)
 - b. In the landing configuration (simulated final approach)
 - c. In the departure turn (simulated turn after take off)
 - d. Cruise checks after stalling

Recovery to base:

- Suitable circuit join with standard RT calls
- Practise normal circuits
- Practise selected circuit emergency from overview

STANDARD:

The student demonstrates the correct use of the requisite techniques to:

- ☐ Carry out all relevant checks and drills
- ☐ Recognise and recover from an incipient stall on a simulated final turn
- ☐ Recognise and recover from an incipient stall on a simulated final approach
- ☐ Recognise and recover from an incipient stall on a simulated departure turn
- ☐ Fly a standard circuit
- ☐ Use standard RT procedures

LESSON G17 – METEOROLOGY 2

(1.30)

Ref: Alt MoC1 TK 03.(D)

Wind

- (1) Cause of wind
- (2) Variation of wind velocity with altitude
- (3) Local winds

LESSON G18 – METEOROLOGY 3

(1.30)

Ref: Alt MoC1 TK 03.(E)

Clouds and Precipitation

- (1) Formation of cloud
- (2) Principle cloud types
- (3) Precipitation

LESSON G19 – LAW 6

(1.30)

Ref: Alt MoC1 TK 01.(F) & (H)

Altimeter Setting Procedures

- (1) Height, altitude and flight level
- (2) VFR altimeter setting procedures

Aeronautical Information Service (AIS)

- (1) Aeronautical Information Service (AIS)
- (2) Aeronautical Information Publication (AIP)
- (3) NOTAMs

LESSON G20 – LAW 7

(2.00)

Ref: Alt MoC1 TK 03.(J) & (K)

Pilot Licensing

- (1) Medical certificates
- (2) Private Pilot Licence (PPL) privileges
- (3) Light Aircraft Pilot Licence (LAPL) privileges
- (4) Class Rating
- (5) Type Rating
- (6) Other Ratings and certificates

National Procedures

National rules and procedures

LESSON G21 – PRINCIPLES OF FLIGHT 5

(2.00)

Ref: Alt MoC1 TK 05.(D)

Stability and Control

- (1) Stability and control in yaw
- (2) Stability and control in roll
- (3) Stability and control in pitch
- (4) Trimming controls
- (5) High lift devices
- (6) Air brakes and spoilers
- (7) Other flying controls

LESSON A13 - FIRST SOLO (CHECK POINT)

(0.15)

Ref: Alt MoC1 Ex 14

Pre-requisites:

- Valid medical certificate
- Satisfactory handling of circuit emergencies
- Satisfactory knowledge of Air Law and Communications

Aim: To safely fly a circuit of the airfield for the first time unaccompanied.

Likely Threats, Errors and Undesired Aircraft States:

Student bounce/balloon, Pilot unfit to fly

PRE FLIGHT:

- Briefing on: Flight requirements
Action in the event of an unsatisfactory approach or baulked landing

AIR EXERCISE:

- Student fly a circuit and normal landing

STANDARD:

The student demonstrates the correct use of the requisite techniques to:

- ☐ Fly the circuit
- ☐ Make a safe landing
- ☐ Use standard RT

LESSON A14 - APPROACH WITHOUT FLAP/SPOILER/AIRBRAKE (Dual 0.30 Solo 0.40)

Ref: Alt MoC1 Ex 13

- Aims:
1. To consolidate circuit and landing proficiency
 2. To revise and practise circuits and landings without flap/spoiler/airbrake

Likely Threats, Errors and Undesired Aircraft States:

Insufficient performance, Conflicition with other aircraft

PRE FLIGHT:

- Pre-flight revision on flapless approach and landing [Ex 13]
- Weather and NOTAM brief

AIR EXERCISE:

- Revise general circuit procedures
- Revise/Teach circuit procedures without flap/spoiler/airbrake
- Solo consolidation of normal and flapless circuits and landings

STANDARD:

The student demonstrates the correct use of the requisite techniques to:

- ☐ Fly a normal circuit and landing
- ☐ Fly a circuit without flap/spoiler/airbrake
- ☐ Fly a final approach without flap/spoiler/airbrake
- ☐ Make a safe landing without flap/spoiler/airbrake
- ☐ Use standard RT procedures

LESSON A15 - GLIDE APPROACH

(Dual 0.30 Solo 0.40)

Ref: Alt MoC1 Ex 13

- Aims:
1. To revise circuit flying
 2. To fly a glide circuit, approach and landing
 3. To consolidate solo circuit practice

Likely Threats, Errors and Undesired Aircraft States:

Landing too far up runway, Wind exceeds limits

PRE FLIGHT:

Pre-flight brief on glide circuit, approach and landing [Ex 13]
Weather and NOTAM brief

AIR EXERCISE:

- Revise normal and glide circuit procedures
- Revise Glide approach;
- Carry out solo consolidation of normal, flapless and glide circuits and landings under supervision

STANDARD:

The student demonstrates a clear understanding of the principles of:

- Adjusting the approach path by altering bank angle
- Abandoning an unstabilised practice approach at an early stage

The student demonstrates the correct use of the requisite techniques to:

- ☐ Fly a normal circuit and landing
- ☐ Fly a safe glide circuit, approach and go-around
- ☐ Fly a safe glide landing
- ☐ Use standard RT procedures

LESSON A16 - CROSSWIND TAKE-OFF & LANDING

Carried out when conditions dictate

(Dual 0.30 Solo 0.30)

Ref: Alt MoC1 Ex 12,13

Aim: To safely handle the aircraft during take-off and landing in crosswind conditions.

Likely Threats, Errors and Undesired Aircraft States:

Excessive gust, Balloon during Flare, Bounced Landing.

PRE FLIGHT:

- Pre-flight brief on Crosswind Take-off and Landing
- Weather and NOTAM brief

AIR EXERCISE:

- Calculation of crosswind component
- Use of elevator/aileron to counter wind effects taxiing
- Take-off and initial climb
 - Anticipation and prevention of weathercocking and wing lifting
 - Drift allowance when airborne on all circuit legs
- The approach
 - Aircraft configuration
 - Drift allowance
- The landing
 - Wing down or crab technique to offset for drift
 - Aligning aeroplane with landing path just prior to touchdown
 - Control after landing
- Revise mislanding and go-around (bounce/balloon)

STANDARD:

The student demonstrates a clear understanding of the principles of:

- Crosswind operations and personal limits

The student demonstrates the correct use of the requisite techniques to:

- ☐ Fly a safe circuit in a crosswind
- ☐ Allow for drift on approach
- ☐ Make a safe landing in a crosswind
- ☐ Cope with a mislanding
- ☐ Use standard RT procedures

LESSON A17 - SHORT & SOFT FIELD TAKE-OFF AND LANDING

(Dual 0.30 Solo 0.20)

Ref: Alt MoC1 Ex 12,13

Aim: To take off and land in minimum distance.

Likely Threats, Errors and Undesired Aircraft States:

Short runway, Recent heavy rain

PRE FLIGHT:

- Pre-flight brief on Short & Soft Field Take-off and Landing (Ex12 &13)
- Weather and NOTAM brief

AIR EXERCISE:

- Runway conditions, short field technique
- Short field take-off
 - Aircraft configuration
 - Control of lift off
 - Best angle climb out to clear obstacle – convert to best rate
- Short field landing
 - Aircraft configuration
 - Approach picture
 - Speed control
 - Landing flare
 - Control after landing/maximum effective braking
- Repeat take-off and landing sequences using soft field techniques

STANDARD:

The student demonstrates the correct use of the requisite techniques to:

- ☐ Carry out a short field take-off
- ☐ Carry out a soft field take-off
- ☐ Achieve and maintain best angle of climb and recover to best rate
- ☐ Make a safe short field landing
- ☐ Make a safe soft field landing
- ☐ Use standard RT procedures

LESSON G22 – METEOROLOGY 4

(2.00)

Ref: Alt MoC1 TK 03.(F)

Visibility

- (1) Fog and mist
- (2) Haze and smoke
- (3) Visibility in precipitation

LESSON G23 – METEOROLOGY 5

(1.00)

Ref: Alt MoC1 TK 03.(C)

Altimetry

- (1) Altimeter and pressure settings
- (2) Altimeter temperature and pressure effects

LESSON G24 – METEOROLOGY 6

(1.30)

Ref: Alt MoC1 TK 03.(G) & (I)

Air Masses

Characteristics of air masses

High Pressure Systems

- (1) Anticyclones
- (2) Ridges
- (3) Cols

LESSON G25 – METEOROLOGY 7

(2.00)

Ref: Alt MoC1 TK 03.(H)

Low Pressure Systems

- (1) The warm sector depression
- (2) The warm front
- (3) The cold front
- (4) Occluded fronts
- (5) Troughs and convergence

LESSON G26 – OPERATIONAL PROCEDURES 3

(1.30)

Ref: Alt MoC1 TK 06.(B)

Operation of Aircraft

- (1) Applicability of EASA regulations
- (2) Responsibility and authority of Pilot in Command (PIC)
- (3) Documents to be carried
- (4) Dangerous goods
- (5) Fuel and oil, refuelling
- (6) Instruments and equipment
- (7) Safety equipment

LESSON G27 – FLIGHT PERFORMANCE AND PLANNING 1

(2.00)

Ref: Alt MoC1 TK 07.(A)

Mass and Balance

- (1) Mass limitations
- (2) Calculation of aircraft mass
- (3) Centre of gravity limitations
- (4) Calculation of centre of gravity



Phase 3

During Phase 3 Exercises 15 to 19 should be completed and previous exercises revised.

Theoretical Knowledge

Briefings and debriefings should introduce or confirm elements of most of the subjects as the course progresses. The student should demonstrate satisfactory knowledge of Operational Procedures, Meteorology and Human Performance, before flying solo outside the circuit. A satisfactory knowledge of Navigation must be demonstrated before solo navigation exercises, and knowledge of Flight Performance and Planning before the solo qualifying cross-country. Before applying for Skill Test, the student must have passed all the required Theoretical Knowledge examinations, and most of these should be normally be attempted well before the final flying exercises.

Threat and Error Management

In addition to those suggested in individual lessons, the threats and errors below may affect flight during this phase. Suitable mitigations should be considered and applied.

THREATS

- Loss of bearings
- Engine failure
- Blind spots
- Confined airspace due weather
- Poor landing area
- Other aircraft including in the circuit and military low flying
- Unfamiliar runway shape/ size/surface at landaway bases
- Illusion of speed/sideslip at low altitude
- Physiological sensations in cloud/poor visibility
- Instrument limits

ERRORS

- Breach of low flying regulations
- Errors in measuring / calculating navigation data
- Feature misidentification
- Inadequate terrain clearance
- Poor lookout whilst using radio aids

AIR SYLLABUS CHECK LIST – EASA Ref: Alt MoC1 FCL.210

AMC Ref.	Alt MoC 1 Exercise
Ex 11 Spin avoidance	<ul style="list-style-type: none"> (a) Safety checks (b) Recognition of the incipient spin (c) Recovery from the incipient spin
Ex 15 Advanced turning	<ul style="list-style-type: none"> (a) Entering the steep (minimum 45° angle of bank) turn (b) Maintaining the steep turn (c) Returning to straight and level flight (d) Steep descending turn (e) Approach to the stall in the turn (f) Recognition of and recovery from the spiral dive (g) Recovery from other unusual attitudes
Ex 16 Forced Landing without power	<ul style="list-style-type: none"> (a) Forced landing procedure (b) Assessing the surface wind (c) Assessing the gliding range (d) Selecting a suitable landing area (e) Planning the approach path, provision for change of plan (f) Cause of engine failure checks (g) Use of the radio (h) Committal / pre landing checks and actions (i) Final approach and landing (j) Actions after landing (k) In-flight engine stopping procedure [TMG] (l) In-flight engine restarting procedure [TMG]
Ex 17 Precautionary Landing	<ul style="list-style-type: none"> (a) Precautionary landing procedure (b) Selection of landing area (c) Surrounding area and landing site inspection (d) Approach and landing (e) Actions after landing
Ex 18a VFR Navigation – Flight Planning	<ul style="list-style-type: none"> (a) Route selection (b) Controlled and regulated (notified) airspace (c) Chart selection and preparation (d) Safety altitude/minimum safety altitude (MSA) (e) Weather forecasts and actual reports (f) Daylight (sunrise and sunset) (g) Completion of the flight log, navigation calculations (h) Fuel planning (i) Mass and balance calculation (j) Performance calculations (k) Alternate airfields (l) Radio frequencies (m) NOTAMS and AIS information (n) Aircraft documentation (o) Flight notification
Ex 18a VFR Navigation – Departure and En Route procedure	<ul style="list-style-type: none"> (a) Airfield departure procedures (b) Air Traffic Service and radio procedures (c) Departing non controlled aerodromes (as applicable) (d) Departing controlled aerodromes and controlled (notified) airspace (e) Altimeter setting procedures (f) Principles of map reading (g) Maintaining airspeed, altitude and heading (h) Maintaining flight log (i) Assessing weather en route, weather minima (j) Revision of ETA and heading (k) Monitoring fuel state and systems (l) Turning point procedure (m) Transiting controlled (notified) airspace (n) Organising cockpit workload

Ex 18a VFR Navigation – arrival procedures	<ul style="list-style-type: none"> (a) ATC and radio procedures (b) Arriving at non controlled aerodromes (as applicable) (c) Arriving at controlled aerodromes and controlled (notified) airspace (d) Altimeter setting procedures (e) Circuit joining procedures (f) Parking and aircraft security (g) Refuelling (h) Notification of arrival, administration procedures
Ex 18b Navigation problems at lower levels and in reduced visibility	<ul style="list-style-type: none"> (a) Actions before descending or entering DVE (b) Appropriate aeroplane configuration (c) Hazards, obstacles and terrain (d) Map reading at lower level and in DVE (e) Visual impressions of flight at minimum level (f) Visual impressions of flight in DVE (g) Effect of wind, turbulence and windshear (h) Vertical situational awareness (i) Weather considerations and assessing weather (j) Noise sensitive areas
Ex 18c Radio navigation	<ul style="list-style-type: none"> (a) Pre flight radio navigation preparation (b) Integrating radio navigation into VFR navigation (c) Use of the Relative Bearing Indicator (RBI)* (d) Use of the Radio Magnetic Indicator (RMI)* (e) Use of the Course Deviation Indicator (CDI)* (f) Use of the Horizontal Situation Indicator (HSI)* (g) Use of the moving map display* (h) VDF - Air Traffic Control and radio procedures* (i) ATC Radar - ATC and radio procedures* (j) Secondary Surveillance Radar (SSR) – Transponder operation* (k) VOR - Selection and identification, interpretation, intercepting and maintaining a radial, position fixing or * (l) DME - Selection and identification, interpretation, modes of operation, position fixing or* (m) ADF - Selection and identification, interpretation, orientation, homing to an NDB or* (n) GNSS – Selection of waypoints, interpretation, orientation, error messages* <p>* Specific radio navigation aids as applicable depending on aircraft equipment and ATC facilities</p>
Exercise 18e Emergency and Abnormal Procedures	<ul style="list-style-type: none"> (a) Diversion procedure (b) Uncertain of position and lost procedures (c) Loss of sight of the surface (d) Electrical failure (e) Radio failure (f) Instrument failure (g) Systems failure
Ex 19 Basic instrument flight	<ul style="list-style-type: none"> (a) Instrument appreciation, physiological sensations (b) Instrument interpretation - the attitude indicator and instrument scan (c) Straight and level flight (d) The climb (e) The cruise descent (f) The turn (g) Recoveries from unusual attitudes

LESSON A18 – ADVANCED TURNING

(1.00)

Ref: Alt MoC1 Ex 15

Aim: To learn to fly level & descending 45° AOB Turns

Likely Threats, Errors and Undesired Aircraft States:

Aircraft on collision course, Spiral dive, Stall in turn

PRE FLIGHT:

- Pre-flight brief on Advanced Turning (Ex 15)
- Weather and NOTAM brief

AIREX:

- Revise short field takeoff, climbing (V_X V_Y) and climbing turns on to headings
- Student revise 30° AOB turns

Advanced Turning;

- Level 45° AOB Turns
- Use of magnetic compass (simulated DI Failure)
- Steep descending turns 45 ° AOB
- Stalling in the turn and recovery
- Recoveries from undesired aircraft states, including spiral dives
- Revise overhead join

STANDARD:

The student demonstrates the correct use of the requisite techniques to:

- ☐ Fly level and descending turns at cruise speed using 45°- 50° AOB
- ☐ Recover the aircraft from a stall in the turn
- ☐ Recover the aircraft safely from Unintended Attitudes including Spiral Dives

LESSON A19 – SPIN AVOIDANCE

(0.45)

Ref: Alt MoC1 Ex 11

Aim: To recognise and recover the aircraft safely from the spin at the incipient stage with minimum height loss

Likely Threats, Errors and Undesired Aircraft States:

Controls mishandled, Other aircraft, Incorrect configuration, Harness insecure, Loose objects, Engine fails, Diving towards excessive airspeed

PRE FLIGHT:

- Pre-flight brief on Spin avoidance (Ex11)
- Weather and NOTAM brief
- Note control central position

AIREX:

Incipient spin recognition and recoveries:

- From stall in a climbing turn with full power
- From stall in a steep, level turn.
- Instructor induced distractions during the stall
- Recovery from extreme undesired aircraft states

Demonstration;

- Full spin and recovery

STANDARD:

The student demonstrates a clear understanding of the principles of:

- ☐ Using the Flight Manual or POH to identify correct spin recovery technique

The student recognises:

- ☐ The incipient stage of the spin

The student demonstrates the correct use of the requisite techniques to:

- ☐ Recover the aircraft safely from the Incipient Spin Stage
- ☐ Recover the aircraft safely from extreme undesired aircraft states

LESSON G28 – OPERATIONAL PROCEDURES 4

(1.30)

Ref: Alt MoC1 TK 06.(D) (E), (F) & (G)

Search and Rescue Procedures

- (1) Principles of search and rescue procedures
- (2) Search and rescue signals

Accidents and Incidents

- (1) Accident definitions and investigation
- (2) Safety reporting
- (3) Safety publications

Care of Passengers

Passenger briefing and passenger procedures

National Procedures

National rules and procedures

LESSON G29 – METEOROLOGY 8

(2.00)

Ref: Alt MoC1 TK 03.(J)

Hazardous Weather Conditions: Icing

- (1) Airframe icing
- (2) Rain ice
- (3) Frost
- (4) Piston engine icing

LESSON G30 – METEOROLOGY 9

(1.00)

Ref: Alt MoC1 TK 03.(J)

Hazardous Weather Conditions: Thunderstorms

- (1) Formation of thunderstorms
- (2) Hazards for aircraft

LESSON G29 – METEOROLOGY 10

(2.00)

Ref: Alt MoC1 TK 03.(J)

Other Hazardous Weather Conditions:

- (1) Mountainous areas
- (2) Turbulence
- (3) Wind shear
- (4) Strong winds

LESSON G29 – METEOROLOGY 11

(2.00)

Ref: Alt MoC1 TK 03.(J)

Meteorological Information

- (1) Synoptic charts
- (2) Satellite imagery
- (3) Ground based weather radar
- (4) Area and significant weather forecasts
- (5) TAFs and METARs
- (6) Sources of meteorological information

Forecast and observation parameters and tolerances

National Procedures

National procedures

LESSON A20 - FORCED LANDINGS WITHOUT POWER

(1.00)

Ref: Alt MoC1 Ex 16

Aim: To plan, fly an approach and to land safely in the event of a complete engine failure.

Likely Threats, Errors and Undesired Aircraft States:

Engine failure, Too high in pattern, Low flying military aircraft

PRE FLIGHT:

- Pre-flight brief with Forced Landings Without Power (Ex16) as main exercise
- Weather and NOTAM brief

AIREX:

- Short field take-off over 50ft obstacle
- Field selection
- Ideal FLWOP procedure
- Revise climbing at best angle
- Practise emergency
- Further practise of full procedure.

STANDARD:

The student demonstrates the correct use of the requisite techniques to:

- ☐ Execute a planned approach
- ☐ Perform relevant checklist drills

LESSON A21 - FORCED LANDINGS WITHOUT POWER PART 2

(1.00)

Ref: Alt MoC1 Ex 16

Aim: To plan, fly an approach and to land safely in the event of a complete or partial engine failure.

Likely Threats, Errors and Undesired Aircraft States:

Carburettor icing, Real engine failure, Low flying military aircraft

PRE FLIGHT:

- Pre-flight brief with Forced Landing Without Power and partial engine failure (Ex16) as main exercise.
- Pre-flight brief on stopping and restarting the engine in flight [Ex16 TMG]
- Weather and NOTAM brief

AIREX:

FLWOP:

- Practise procedure from altitude .
- Adjusted procedure for failure at lower altitude
- Adjusted procedure for failure at 1000' AGL
- Practise from different starting altitudes and locations.
- Actions in the event of partial engine failure.

Engine stopping/starting in flight [TMG]

- Engine stopping procedure [TMG]
- Engine restart procedure [TMG]

Recovery to base:

Overhead join and PFL from overhead if traffic permits or glide approach & landing

STANDARD:

The student demonstrates a clear understanding of the principles of:

- ☐ Maximising use of available power
- ☐ Maintaining a safe airspeed

The student demonstrates the correct use of the requisite techniques to:

- ☐ Execute a planned approach
- ☐ Perform relevant checklist drills
- ☐ Make a Distress R/T call
- ☐ Brief passengers in the event of an emergency
- ☐ Stop and restart the engine in flight [TMG]

LESSON G30 – HUMAN PERFORMANCE 1

(2.00)

Ref: Alt MoC1 TK 02.(A)

Basic Aviation Physiology

- (1) Hypoxia
- (2) Hyperventilation
- (3) Vision and visual illusions
- (4) Lookout techniques
- (5) Hearing and balance
- (6) Spatial disorientation
- (7) Sleep and fatigue
- (8) Common ailments, medication, health
- (9) Toxic hazards
- (10) Intoxication

LESSON G31 – HUMAN PERFORMANCE 2

(2.00)

Ref: Alt MoC1 TK 02.(B)

Basic Aviation Psychology

- (1) Perception
- (2) Memory
- (3) Arousal and performance
- (4) Stress and stress management
- (5) Personality types
- (6) Hazardous attitudes

LESSON G32 – HUMAN PERFORMANCE 3

(2.00)

Ref: Alt MoC1 TK 02.(C)

Principles of Threat and Error Management

- (1) Threats
- (2) Errors
- (3) Undesired aircraft states
- (4) Countermeasures
- (5) Situational awareness
- (6) Decision making
- (7) Developing sound judgement

LESSON G33 – NAVIGATION 1

(2.00)

Ref: Alt MoC1 TK 09.(A), (B), (C), & (D)

Form of the Earth

- (1) Latitude and Longitude

Measurement of Direction

- (1) True direction
- (2) Magnetic direction
- (3) Compass direction

Measurement of Distance

- (1) Units of distance
- (2) Conversion of units

Measurement of Airspeed

- (1) Calculation of true airspeed

LESSON A22 – PRECAUTIONARY LANDING

(1.00)

Ref: Alt MoC1 Ex 17

Aim: To learn when a precautionary landing is appropriate and how to execute a safe approach to a selected landing area.

Likely Threats, Errors and Undesired Aircraft States:

Deteriorating weather, Poor visibility, Surrounding weather, Dusk, Poor landing area

PRE FLIGHT:

- Pre-flight brief with Precautionary Landing (Ex17) as main exercise
- Weather and NOTAM brief
- **Student plan:** short field takeoff and landing performance calculations, route to suitable area

AIREX:

- Practise Forced Landing procedure
- Revise poor visibility configuration.
- Selecting suitable field
Wind / surface / size / slope / stock / surroundings
- Precautionary circuit procedure
- Practises at different locations with different simulated scenarios
- Recovery to base for short field landing practice from precautionary pattern

STANDARD:

The student demonstrates the correct use of the requisite techniques to:

- ☐ Achieve and maintain safe slow flight
- ☐ Execute a planned approach
- ☐ Perform relevant checklist drills

LESSON A23 - SOLO SECTOR RECCE (CHECK POINT)

(1.15)

Ref: Alt MoC1 Ex 14

Pre-requisites:

- Satisfactory knowledge of Communications Theory
- Satisfactory knowledge of Operational Procedures
- Satisfactory knowledge of Meteorology
- Satisfactory knowledge of Human Performance

Aim: To safely fly a departure to the local area, practise general handling, then rejoin the circuit to land.

Likely Threats, Errors and Undesired Aircraft States:

Loss of bearings, System/Engine problems, Unsure of ATC clearance

AIREX:

Student to fly solo, leave the circuit and carry out general handling, return and land as authorised by the instructor

STANDARD:

The student demonstrates the correct use of the requisite techniques to:

- ☐ Fly the departure
- ☐ Rejoin the circuit
- ☐ Fly the circuit following the join
- ☐ Use standard RT procedures

LESSON G34 – AIRCRAFT GENERAL KNOWLEDGE 1

(1.00)

Ref: Alt MoC1 TK 08.(A), (B) & (C)

The Airframe

- (1) Airframe design and construction
- (2) Serviceability checks

Flying Controls

- (1) Flying control design and construction
- (2) Serviceability checks

Undercarriage

- (1) Undercarriage design and construction
- (2) Tyres and brakes
- (3) Serviceability checks

LESSON G35 – AIRCRAFT GENERAL KNOWLEDGE 2

(2.00)

Ref: Alt MoC1 TK 08.(D) & (E)

Piston Engines

- (1) Principles of operation
- (2) Piston engine design and components
- (3) Serviceability checks

Piston Engine Systems

- (1) Fuel system
- (2) Induction system
- (3) Ignition system
- (4) Oil system
- (5) Cooling system
- (6) Other engine systems

LESSON G36 – AIRCRAFT GENERAL KNOWLEDGE 3

(2.00)

Ref: Alt MoC1 TK 08.(I)

Instruments and Systems

- (1) The pitot static system
- (2) The altimeter
- (3) The vertical speed indicator
- (4) The air speed indicator
- (5) The suction system
- (6) Attitude indicator
- (7) Heading indicator
- (8) The turn indicator / turn co-ordinator
- (9) The compass
- (10) Other instrumentation
- (11) Integrated electronic displays

LESSON G37 – NAVIGATION 2

(2.00)

Ref: Alt MoC1 TK 09(E)

Triangle of Velocities

Calculating heading and groundspeed

LESSON A24 – BASIC INSTRUMENT FLYING 1

(1.00)

Alt MoC1 Ex 19

Aim: To learn to fly the aircraft by sole reference to instruments

Likely Threats, Errors and Undesired Aircraft States:

Physiological sensations, Inadvertent entry into cloud

PRE FLIGHT:

- Pre-flight brief on Basic Instrument Flying (Ex19)
- Weather and NOTAM brief

AIREX:

Basic Instrument Flying;

- Physiological Sensations
- Attitude Instrument Flight, Instrument Appreciation
- Instrument Limitations
- Basic Manoeuvres (S+L / speed changes / configuration changes)
- Climbing and descending
- Standard rate turns (Climbing/ descending/ on to headings)
- Recoveries from gentle unusual positions
- Technique to recover to VFR flight from inadvertent entry into IMC (180° level turn in simulated IMC)

STANDARD:

The student demonstrates the correct use of the requisite techniques to:

- ☐ Control the aircraft and monitor its performance by sole reference to instruments

LESSON A25 – BASIC INSTRUMENT FLYING 2

(1.00)

Ref: Alt MoC1 Ex 19

Aim: To consolidate the techniques required to fly the aircraft by sole reference to instruments

Likely Threats, Errors and Undesired Aircraft States:

Exceed instrument limits, Physiological sensations, Flight above freezing level, Instrument faults

PRE FLIGHT:

- Briefing on Selective Radial Scan for Basic Instrument Flying (Ex19)

AIREX:

- Revise basic instrument flight and recoveries from unusual positions.
- Use of the Selective Radial Scan
- Revise recoveries to VFR flight from inadvertent entry into IMC

STANDARD:

The student demonstrates the correct use of the requisite techniques to:

- ☐ Control the aircraft and monitor its performance on Instruments to a Skill Test standard

LESSON A26 – MINIMUM VISIBILITY FLYING

[DEGRADED VISUAL ENVIRONMENT (DVE)]

(1.00)

Ref: Alt MoC1 Ex 10a & 19

Aim: To combine visual and instrument inputs in minimum visibility

Likely Threats, Errors and Undesired Aircraft States:

Lack of visual horizon, Poor in-flight visibility, Physiological sensations

PRE FLIGHT:

- Pre-flight brief on the Integrated Attitude Scan technique
- Weather and NOTAM brief

AIREX:

- Revise instrument flying during climb
- Set up poor visibility configuration on instruments
- **Integrated Technique** (using foggles or flying at night);
 - Advice to avoid flight in poor visibility
 - Integrate AI into normal visual S&L scan
 - Standard rate turns using integrated technique
 - Climbing and descending
 - Interpreting radar information for avoiding action

STANDARD:

The student demonstrates the correct use of the integrated technique to:

- ☐ Control the aircraft and recover to base in minimum visibility:
- ☐ Interpret external traffic information

LESSON G38 – NAVIGATION 3

(2.00)

Ref: Alt MoC1 TK 09.(F)

In-flight VFR Navigation: Dead Reckoning and Map Reading

- (1) Principles of dead reckoning
- (2) Time and distance
- (3) Map reading

LESSON G39 – NAVIGATION 4

(1.00)

Ref: Alt MoC1 TK 09.(G)

In-flight VFR Navigation: Off-track and Diversion

- (1) Off track correction
- (2) ETA revision
- (3) Diversion
- (4) Alternate airfields

LESSON G40 – NAVIGATION 5

(1.00)

Ref: Alt MoC1 TK 09.(H)

In-flight VFR Navigation: Vertical Navigation

- (1) Safety altitudes
- (2) Vertical navigation
- (3) Altimeter settings

LESSON G41 – NAVIGATION 6

(1.00)

Ref: Alt MoC1 TK 09.(I)

In-flight VFR Navigation: Controlled and Notified Airspace

- (1) Procedures in the vicinity of controlled and notified airspace
- (2) Procedures within controlled and notified airspace
- (3) Airspace infringement

LESSON G42 – NAVIGATION 7

(1.00)

Ref: Alt MoC1 TK 09.(G)

Time

- (1) UTC
- (2) Time Zones
- (3) Sunrise and sunset information

LESSON G43 – PRE FLIGHT PLANNING 2

(2.00)

Ref: Alt MoC1 TK 07.(E) & (F)

VFR Flight Planning

- (1) Route selection
- (2) Communication and radio navigation selection
- (3) Completion of the navigation plan
- (4) The Aeronautical Information Publication (AIP)
- (5) NOTAMs
- (6) Obtaining meteorological information
- (7) International flight

Fuel Planning

- Fuel required calculation

LESSON A27 – DUAL NAVIGATION 1

(1.15)

Ref: Alt MoC1 Ex 18a

Aim: To plan and fly a navigation route, using suitable visual navigation techniques

Likely Threats, Errors and Undesired Aircraft States:

Errors in measuring / calculating navigation data, Feature misidentification, Poor choice of fixes

PRE FLIGHT:

- Pre-flight brief on Visual Navigation (Ex18a)
- Planning a triangular route (Flight time approx 0.8 hour)
- Weather and NOTAM brief

AIREX:

- Cruise climb to start point.
- Start point actions
- Revise maintenance of S & L.
- Fix identification
- Regaining track & adjusting heading
- Adjusting ETA
- Routine checks
- Turning point actions
- Alternate methods of regaining track as opportunity allows.

STANDARD:

The student demonstrates the correct use of the requisite techniques to:

- ☐ Prepare a Map for a navigation route
- ☐ Make navigation planning calculations and complete a plog
- ☐ Use a basic visual navigation technique and work cycle
- ☐ Obtain weather information and extract data relevant to nav planning
- ☐ Obtain and interpret NOTAMS
- ☐ Depart the airfield using previously taught techniques and procedures

LESSON A28 – DUAL NAVIGATION 2

(1.15)

Ref: Alt MoC1 Ex 18a, 18e

- Aims: 1. To consolidate basic nav technique.
2. To learn en-route hazard avoidance and diversion techniques.

Likely Threats, Errors and Undesired Aircraft States:

Other aircraft, Lowering cloudbase, Hazard ahead on track

PRE FLIGHT:

- Pre-flight brief on en-route diversion (Ex18e)
- Route planning
- Weather and NOTAM brief

AIREX:

- Practise basic navigation techniques.
- “Dog-leg” hazard avoidance.
- En-route diversion to new destination.

STANDARD:

The student demonstrates a clear understanding of the principles of:

- ☐ Acceptable minimum weather conditions to continue VFR
- ☐ Sound in-flight decision making

The student demonstrates the correct use of the requisite techniques of

- ☐ Completing pre-flight navigation planning for route
- ☐ Basic visual navigation
- ☐ A ‘dog- leg’ diversion
- ☐ An en-route diversion

LESSON G44 – PREFLIGHT PLANNING 3 (2.00)

Ref: Alt MoC1 TK 07.(B) & (D)

Performance - Take-Off and Climb

- (1) Factors affecting take-off and climb performance
- (2) Calculation of take-off and climb performance

Performance - Descent and Landing

- (1) Factors affecting descent and landing performance
- (2) Calculation of descent and landing performance

LESSON G45 – PREFLIGHT PLANNING 4 (2.00)

Ref: Alt MoC1 TK 07.(C)

Performance - Cruise

- (1) Principles of endurance and range
- (2) Factors affecting cruise performance
- (3) Calculation of cruise performance

LESSON G46 – PRINCIPLES OF FLIGHT 6 (1.00)

Ref: Alt MoC1 TK 05.(F)

Operating Limitations

- (1) Airspeed and load limitations
- (2) The load diagram (manoeuvring envelope)
- (3) Other operating limitations

LESSON G47 – PREFLIGHT PLANNING 5 (1.00)

Ref: Alt MoC1 TK 07.(G) & (H)

ICAO (ATS) Flight Plan

- (1) Requirement to File ICAO (ATS) Flight plan
- (2) Submission of the ICAO (ATS) Flight plan

National Procedures

National rules and procedures

LESSON G48 – AIRCRAFT GENERAL KNOWLEDGE 4 (2.00)

Ref: Alt MoC1 TK 08.(F) & (G)

The Propeller

- (1) Principles of operation
- (2) Propeller design and components
- (3) Propeller handling
- (4) Serviceability checks

Engine Handling

- (1) Engine limitations
- (2) Engine handling

LESSON G49 – AIRCRAFT GENERAL KNOWLEDGE 5 (1.00)

Ref: Alt MoC1 TK 08.(H)

The Electrical System

- (1) Principles of operation
- (2) Electrical system design and components

LESSON A29 – DUAL NAVIGATION 3

(2.20)

Ref: Alt MoC1 Ex 18a, 18e

- Aims:
1. To land at another aerodrome.
 2. To learn procedures for Controlled Airspace.
 3. To learn the Uncertain of Position and Lost Procedures

Likely Threats, Errors and Undesired Aircraft States:

Unfamiliar airfield procedure, Unfamiliar runway shape/size/surface, Uncertain of position

PRE FLIGHT:

- **Pre-flight brief on:**
 - Landaway planning
 - CAS/MATZ entry/crossing
 - Lost Procedure (Ex18e)
- Weather and NOTAM brief
- **Pre-flight planning** including destination performance planning

AIREX:

- Procedures for transit of CAS/regulated airspace
- Joining procedure at landaway airfield
- Booking in/out procedures
- Practise in-flight diversion
- Uncertain of position & lost procedure
- "PRACTICE PAN" call / Training Fix if available

STANDARD:

The student demonstrates the correct use of the requisite techniques to:

- ☐ Make performance calculations using the Flight Manual
- ☐ Obtain and follow a clearance in CAS/regulated airspace
- ☐ Use the correct R/T procedures
- ☐ Apply lost procedures
- ☐ Complete a navigation route after planning
- ☐ Liaise with ATS and join the circuit at destination
- ☐ Follow ground procedures at destination
- ☐ Plan & execute a diversion

LESSON A30 – SOLO NAVIGATION 1

(CHECK POINT)

(1.15)

Ref: Alt MoC1 Ex 18a

Pre-requisites:

- Satisfactory knowledge of VFR Navigation

Aim: To plan and fly a solo VFR navigation route.

Likely Threats, Errors and Undesired Aircraft States:

Over-map-reading

PRE FLIGHT:

- Student to plan a triangular route under supervision
- Solo Navigation Briefing Certificate
- Weather and NOTAM brief

AIREX:

Student flies the route solo completing a log en-route

STANDARD:

The student demonstrates the correct use of the requisite techniques to:

- ☐ Obtain weather information and extract data relevant to nav planning
- ☐ Obtain and interpret NOTAMS
- ☐ Prepare the map for the route
- ☐ Make navigation planning calculations and complete a plog

LESSON A31 – SOLO NAVIGATION 2

(1.15)

Ref: Alt MoC1 Ex 18a

Aim: To consolidate VFR navigation techniques on a solo cross-country flight.

Likely Threats, Errors and Undesired Aircraft States:

Over-map-reading HSI/DI failure, Poor weather en-route

PRE FLIGHT:

- Student plan a triangular route under supervision
- Revise procedures to transit complex airspace
- Revise use of ATC radar service
- Completion of Solo Navigation Briefing Certificate.
- Weather and NOTAM brief.

AIREX:

Student completes the flight solo completing a log en-route

STANDARD:

The student demonstrates the correct use of the requisite techniques to:

- ☐ Obtain weather information and extract data relevant to nav planning
- ☐ Obtain and interpret NOTAMS
- ☐ Prepare the map for the route
- ☐ Make navigation planning calculations and complete a plog

LESSON A32 – DUAL LOW LEVEL NAVIGATION

(1.00)

Ref: Alt MoC1 Ex 10a, 10b, 18b

Aim: To learn how to navigate & operate at low-level (<1000' AGL).

Likely Threats, Errors and Undesired Aircraft States:

Inadequate terrain clearance, Illusion of speed/sideslip, High wind speed, Low engine failure

PRE FLIGHT:

- Preflight brief on low level navigation (Ex 18b)
- Weather and NOTAM brief.
- Pre-flight route planning

AIREX:

- Revise the slow, safe cruise configuration.
- Revise incipient stall recovery in slow safe cruise
- Actions prior to descent to low-level.
- Cruise descent
- Low level navigation technique
- Wind effect on turning at low-level
- Practise en-route diversion at low-level
- **Recovery to base:** Low level bad weather join and circuit

STANDARD:

The student demonstrates a clear understanding of the principles of:

- ☐ Which features are visible at low level and apply this to map reading technique
- ☐ The effect of wind & turbulence at low level
- ☐ Applying noise abatement procedures

The student demonstrates the correct use of the requisite techniques of:

- ☐ Completing the safety checks before descending into low level navigation
- ☐ Correct altimetry procedures & situational awareness to ensure terrain clearance
- ☐ Operation in poor visibility
- ☐ Joining the circuit for a bad weather circuit and applying short field landing technique

LESSON G50 – NAVIGATION 8

(2.00)

Ref: Alt MoC1 TK 09.(K)

VFR Radio Navigation

- (1) Integrating radio navigation with VFR navigation
- (2) VDF – Operation and interpretation, limitations and accuracy
- (3) ATC Radar – Operation and interpretation, limitations and accuracy
- (4) ADF – Operation and interpretation, limitations and accuracy
- (5) VOR – Operation and interpretation, limitations and accuracy
- (6) DME – Operation and interpretation, limitations and accuracy
- (7) GNSS – operation and interpretation, limitations and accuracy

LESSON G51 – AIRCRAFT GENERAL KNOWLEDGE 6

(2.00)

Ref: Alt MoC1 TK 08.(J)

Avionics Systems

- (1) Communications Equipment
- (2) SSR
- (3) ADF
- (4) VOR
- (5) DME
- (6) GNSS
- (7) Integrated Electronic Displays

LESSON G52 – AIRCRAFT GENERAL KNOWLEDGE 7

(2.00)

Ref: Alt MoC1 TK 08.(K) & (L)

Cockpit Equipment and Systems

- (1) Doors, windows and exits
- (2) Seats
- (3) Seat belts and harnesses
- (4) Cockpit heating and ventilation systems

Emergency Equipment

- (1) First aid kit
- (2) Fire extinguishers
- (3) ELT/PLB
- (4) Lifejackets and life rafts
- (5) Other survival equipment

LESSON G53 – AIRCRAFT GENERAL KNOWLEDGE 8

(1.00)

Ref: Alt MoC1 TK 08.(M) & (N)

Aircraft Airworthiness

- (1) Aircraft registration
- (2) Airworthiness Certificate, Permit to Fly

Aeroplane Flight Manual/Pilot Operating Handbook

- (1) Aircraft maintenance and serviceability
- (2) Maintenance and serviceability documentation

LESSON G54 – AIRCRAFT GENERAL KNOWLEDGE 9

(1.00)

Ref: Alt MoC1 TK 08.(O) & (P)

Converting Onto a Another Aircraft Type

Practical considerations when converting onto a different aircraft and/or variants

National Procedures

National rules and procedures

LESSON A33 – DUAL RADIO AIDS NAVIGATION

(1.00)

Ref: Alt MoC1 Ex 18c

Aim: To learn how to navigate using radio navigation aids.

Likely Threats, Errors and Undesired Aircraft States:

Concentrating on radio aids, Wrong navaid selected

PRE FLIGHT:

- Pre-flight brief on Radio Navigation (Ex18c)
- Weather and NOTAM brief

AIREX:

- Correct tracking technique
- Indications overhead VOR
- Orientation relative to NDB if available
- “Homing” to NDB if available
- DME tuning, ident and functions
- DME combined with VOR for position fixing if available

STANDARD:

The student demonstrates the correct use of the requisite techniques to:

- ☐ Fix position using the VOR
- ☐ Intercept and track to/from a given radial or GNSS track
- ☐ Orientate position relative to an NDB
- ☐ Carry out a NDB homing
- ☐ Use a combination of VOR & DME for a position fix

LESSON A34 – EXERCISE 18A SOLO NAVIGATION 3 (CHECK POINT) (2.30)

Ref: Alt MoC1 Ex 18a,

Pre-requisites:

- Satisfactory knowledge of Pre-flight Performance and Planning

Aim: To complete the Solo Qualifying Cross-country navigation exercise.

Likely Threats, Errors and Undesired Aircraft States:

Unfamiliar airfield procedure, Unfamiliar runway shape/size/surface, Uncertain of position

PRE FLIGHT:

- Route planning for landaway at two aerodromes other than the departure point, a minimum of 150 nm total.
- Weather and NOTAM brief.
- Preparation of authorisation certificate to be completed at landaway aerodromes.

AIREX:

- Student completes the flight solo, completing a log en-route ensuring the QCC form is completed at the landaway airfields

STANDARD:

The student demonstrates the correct use of the requisite techniques to:

- ☐ Obtain weather information and extract data relevant to nav planning
- ☐ Obtain and interpret NOTAMS
- ☐ Prepare a map for the route
- ☐ Make navigation planning calculations and complete a plog
- ☐ Calculate Landing & Take-off performance using the Flight Manual/POH

LESSON A35 – GNSS NAVIGATION

(1.00)

Ref: Alt MoC1 Ex 18c

Aim: To learn how to navigate using GNSS in addition to visual navigation.

Likely Threats, Errors and Undesired Aircraft States:

GNSS power failure, GNSS signal failure, Poor lookout whilst using GNSS

PRE FLIGHT:

- Plan visual route
- Preflight brief on: GNSS use and limitations [Ex 18c(A)]
- Weather and NOTAM brief
- Load & activate route in GNSS unit pre-flight

AIREX:

- Use of pre-programmed GNSS route to cross-check track
- GNSS tracking towards a waypoint
- Use of “Direct” or “GO-TO” Function
- Reverting to solely visual navigation techniques.

STANDARD:

The student demonstrates the correct use of the requisite techniques to:

- ☐ Check the validity of the GPS database.
- ☐ Programme a route into the GPS Unit
- ☐ Track the route using headings to achieve desired track & cross refer to the visual navigation plan.
- ☐ Use the “Direct” or “Go-To” Function.
- ☐ Recognise GPS failures/error messages and revert to visual navigation

LESSON A36 – LOW VISIBILITY NAVIGATION

(1.00)

Ref: Alt MoC1 Ex 18b

Aim: To navigate under VFR in low visibility VMC [Degraded Visual Environment (DVE)]

Likely Threats, Errors and Undesired Aircraft States:

High ground/obstructions, Loss of control

PRE FLIGHT:

- Pre-flight brief: Area surface elevations & obstructions and airspace
- Weather (real and simulated) and NOTAM brief
- Route planning

AIREX:

- Gyro acceleration errors (during take-off roll)
- Medium level
 - Revision of integrated scan
 - Revise recovery from spiral dive (inc instrument indications)
 - Revise safe slow flight on instruments
- Low level
 - Effects of gradient wind on drift at 1000ft AGL
 - Reduced visibility - slow safe cruise - wind effect
 - Situation (obstruction) awareness;
 - Map reading
 - Radio aids & communication limitations at low level.
 - Early decision making to turn back/divert/land
 - Integrated scan at low level

STANDARD:

The student demonstrates a clear understanding of the principles of:

- ☐ Spatial Orientation
- ☐ Gradient wind effects
- ☐ Radio Aids limitations
- ☐ Obstruction profiles
- ☐ Situation awareness
- ☐ Minimum Safe Altitude

The student demonstrates the correct use of the techniques to:

- ☐ Fly using an integrated visual/instrument scan
- ☐ Achieve and maintain safe slow flight
- ☐ Carry out rate 1 turns on instruments
- ☐ Carry out compass turns

LESSON A37 – INTRODUCTION TO SKILL TEST

(2.00)

Aim: To experience the content and conduct of the EU PPL(A) Skill Test (Single Engined Piston) and revise to the required PPL(A) Skill Test standards.

LESSON A38 – SOLO NAVIGATION AND GH REVISION (CHECK POINT) (1.15)

Ref: Alt MoC1 Ex 10b, 15, 18a

Pre-requisites:

- Passed all PPL Theoretical Knowledge examinations

Aim: To revise basic visual navigation techniques and general handling solo.

PRE FLIGHT:

- Student plan a single navigation leg to a suitable point. The second leg may be practice of an airborne planned diversion from the end of leg 1 to an area suitable for GH practice (total time on Navigation exercises at least 30 minutes). Student to self-brief weather and NOTAMs.

AIREX:

- Student completes the first leg using visual navigation techniques
- Student practise diversion technique into GH practice area.
- GH practice as authorised by instructor (steep turns/stalling)

STANDARD:

The student demonstrates the correct use of the requisite techniques to:

- ☐ Obtain weather information and extract data relevant to nav planning
- ☐ Obtain and interpret NOTAMS
- ☐ Prepare a map for the route
- ☐ Make navigation planning calculations and prepare a plog
- ☐ Calculate Landing & Take-off performance using the Flight Manual/POH
- ☐ Carry out all relevant checks and drills

