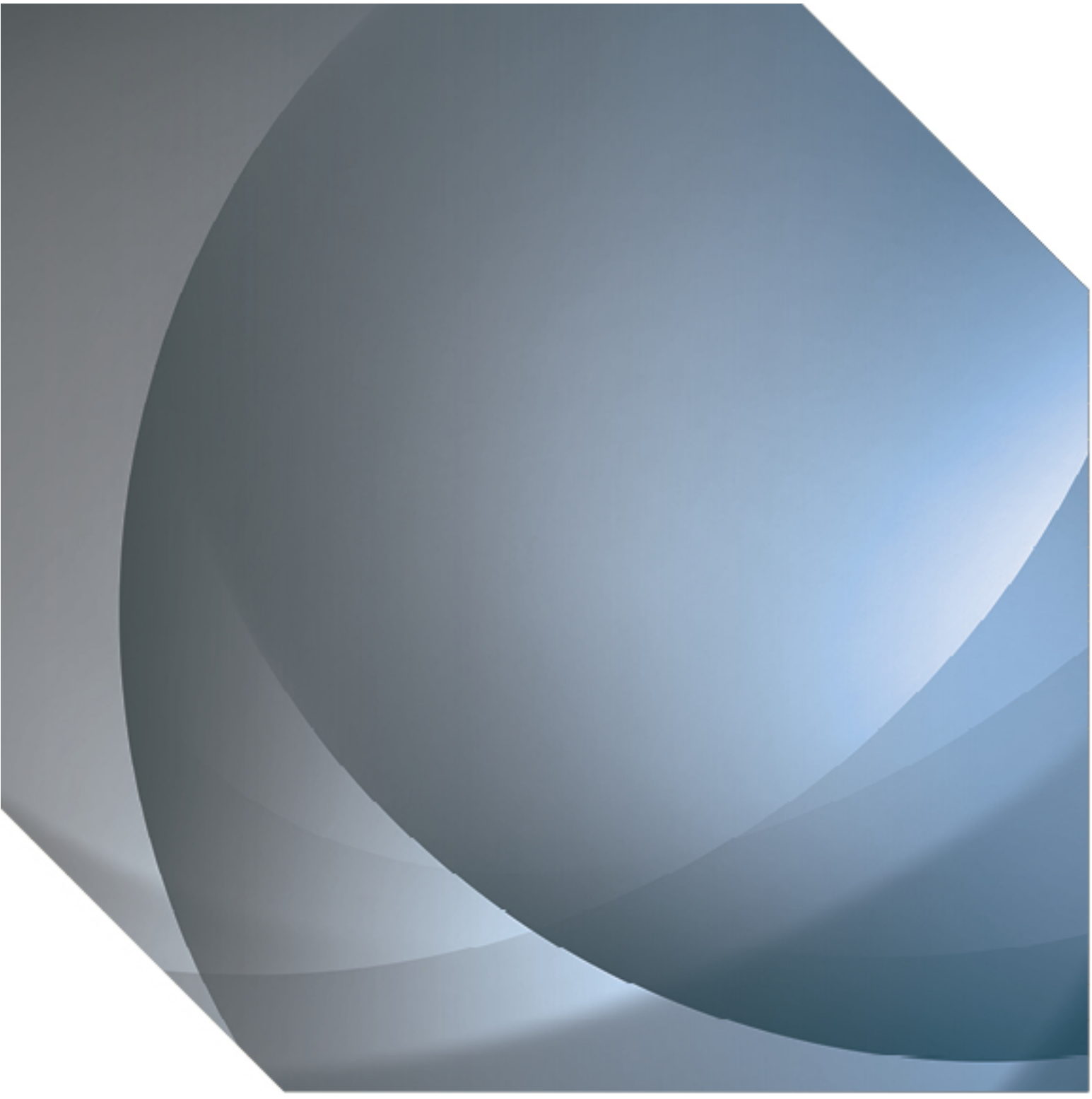
GA Unit

Alternative Means of Compliance 1 FCL.115; FCL.120 Syllabus of Theoretical Knowledge and Flight Training for the LAPL(A)

CAP 1299



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Contents

Background

The creation of a dedicated GA Unit within the CAA emerged from the Government's Red Tape Challenge in 2013, which explored ways to reduce the regulatory burden on the general aviation sector. The 25-strong Unit has been assembled from airworthiness, flight operations and licensing specialists from across the CAA. All have significant knowledge and experience of general aviation, with most being active private pilots. The Unit is based in the CAA's Aviation House facility in Gatwick.

Introduction

1.1 In 2014 the General Aviation Unit of the UK CAA established a working group to review the flight and theoretical knowledge training syllabi for the EU LAPL and PPL(A) published in AMC 1 FCL.110.A and AMC 1 FCL.210.A respectively.

1.2 The working group made up of representative associations and professional training organisations reviewed the existing syllabi, identifying areas to remove, clarify and update additionally items to add into the new syllabi. This was reviewed and a formal Alternative Means of Compliance (AltMOC) was submitted to EASA.

1.3 This document sets out the changes submitted to the Agency to the flight training and theoretical knowledge syllabus for the EU LAPL(A).

Guidance to Training Organisations or Facilities

1.4 The flight and theoretical knowledge training should cover all aspects in an integrated manner, taking into account the particular risks associated with the activity.

1.5 Any theoretical knowledge instruction provided by the training organisation or facility may include elements of classroom work, using such facilities as interactive video, slide or tape presentation, computer based training and other media distance learning tools to provide the training courses.

1.6 The training organisation or facility responsible for the training must ensure that all of the elements of both the theoretical knowledge and flight training have been completed to the required standard before recommending the applicant for an examination or skill test.

1.7 This document details the Alternative Means of Compliance, training organisations and facilities can chose to adopt for the LAPL(A) course. They can also continue to follow the existing Acceptable Means of Compliance detail in AMC1 FCL.115; 120.

1.8 It is the intension of the CAA to establish a new set of LAPL and PPL examinations for this new syllabi.

Theoretical Knowledge Syllabus

1.9 The following tables contain the syllabus for the course of theoretical knowledge for the LAPL(A).

AltMoC 1 FCL.115; 120 – Syllabus of Theoretical Knowledge for the LAPL(A)

1	**Air Law** **International Aviation Law** International Civil Aviation Organisation (ICAO) European Aviation Safety Agency (EASA) National Aviation Authorities (NAA) **European Rules of the Air** Applicability and compliance Pilot in command responsibilities Pre flight actions Avoidance of collisions and rights of way Operation in the vicinity of an aerodrome **Aerodromes** Taxiway and runway signs and markings Preventing runway Incursion Other ground signals Marshalling signals Light signals **Visual Meteorological Conditions (VMC) and Visual Flight Rules (VFR)** Visual Meteorological Conditions (VMC) minima Visual Flight Rules (VFR) Minimum heights **Airspace Classifications** Classification of airspace Controlled and notified airspace Uncontrolled airspace Radio Mandatory Zones (RMZ) Transponder Mandatory Zones (TMZ) **Altimeter Setting Procedures** Height, altitude and flight level VFR altimeter setting procedures **Air Traffic Services** Air Traffic Control Service Flight Information Service Alerting Service **Aeronautical Information Service (AIS)** Aeronautical Information Service (AIS**)** Aeronautical Information Publication (AIP**)** NOTAMs

	Urgency and Distress Procedures Urgency situation Distress situation Interception of civil aircraft **Pilot Licensing** Medical certificates Private Pilot Licence (PPL) privileges Light Aircraft Pilot Licence (LAPL) privileges Class Rating Type Rating Other Ratings and certificates **National Procedures** National rules and procedures
2	**Human Performance** **Basic Aviation Physiology** Hypoxia Hyperventilation Vision and visual illusions Lookout techniques Hearing and balance Spatial disorientation Sleep and fatigue Common ailments, medication, health Toxic hazards Intoxication **Basic Aviation Psychology** Perception Memory Arousal and performance Stress and stress management Personality types Hazardous attitudes **Principles of Threat and Error Management** Threats Errors Undesired aircraft states Countermeasures Situational awareness Decision making Developing sound judgement

3	**Meteorology** **The Atmosphere** Composition of the atmosphere The troposphere **Temperature, Pressure and Density** Temperature variation in the atmosphere Pressure variation in the atmosphere Density Humidity The International Standard Atmosphere (ISA) **Altimetry** Altimeter and pressure settings Altimeter temperature and pressure effects **Wind** Cause of wind Variation of wind velocity with altitude Local winds **Clouds and Precipitation** Formation of cloud Principle cloud types Precipitation **Visibility** Fog and mist Haze and smoke Visibility in precipitation **Air Masses** Characteristics of air masses **Low Pressure Systems** The warm sector depression The warm front The cold front Occluded fronts Troughs and convergence **High Pressure Systems** Anticyclones Ridges Cols **Hazardous Weather Conditions: Icing** Airframe icing Rain ice

	Frost Piston engine icing **Hazardous Weather Conditions: Thunderstorms** Formation of thunderstorms Hazards for aircraft **Other Hazardous Weather Conditions:** Mountainous areas Turbulence Wind shear Strong winds **Meteorological Information** Synoptic charts Satellite imagery Ground based weather radar Area and significant weather forecasts TAFs and METARs Sources of meteorological information Forecast and observation parameters and tolerances **National Procedures** National procedures
4	**Communications** **VHF Radio Broadcast** Factors affecting VHF radio range **Transmission Technique** Transmission of letters Transmission of numbers Transmission of time Call signs **VFR Communications Procedures** Test procedures Standard phraseology Items requiring read back Transfer of communications Transponder operating procedures **Weather Information** ATIS & VOLMET broadcasts, Flight Information Service (FIS) **Communications Failure** Actions in the event of communication failure **Distress and Urgency Procedures** Emergency frequencies and facilities

	Urgency procedures Distress procedures **National Procedures** National rules and procedures
5	**Principles of Flight** **Basic Concepts** Static and dynamic pressure Aerodynamic forces Aerofoils and wings **The Four Forces** Weight Thrust Lift Drag **The Stall** Stalling angle of attack Factors affecting stall characteristics Factors affecting stalling speed Stall warning Spin avoidance Spinning characteristics **Stability and Control** Stability and control in yaw Stability and control in roll Stability and control in pitch Trimming controls High lift devices Air brakes and spoilers Other flying controls **Principles of Flight** Straight and level flight Climbing Descending Turning and manoeuvring **Operating Limitations** Airspeed and load limitations The load diagram (manoeuvring envelope) Other operating limitations

6	**Operational Procedures** **Application of Threat and Error Management** Application of Threat and Error Management (TEM) in relation to aircraft operation **Operation of Aircraft** Applicability of EASA regulations Responsibility and authority of Pilot in Command (PIC) Documents to be carried Dangerous goods Fuel and oil, refuelling Instruments and equipment Safety equipment **Avoidance of Hazards** Avoiding hazardous situations Avoidance of wake turbulence **Search and Rescue Procedures** Principles of search and rescue procedures Search and rescue signals **Accidents and Incidents** Accident definitions and investigation Safety reporting Safety publications **Care of Passengers** Passenger briefing and passenger procedures **National Procedures** National rules and procedures
7	**Flight Performance and Planning** **Mass and Balance** Mass limitations Calculation of aircraft mass Centre of gravity limitations Calculation of centre of gravity **Performance - Take-Off and Climb** Factors affecting take-off and climb performance Calculation of take-off and climb performance **Performance - Cruise** Principles of endurance and range Factors affecting cruise performance Calculation of cruise performance

	Performance - Descent and Landing Factors affecting descent and landing performance Calculation of descent and landing performance **VFR Flight Planning** Route selection Communication and radio navigation selection Completion of the navigation plan The Aeronautical Information Publication (AIP) NOTAMs Obtaining meteorological information International flight **Fuel Planning** Fuel required calculation **ICAO (ATS) Flight Plan** Requirement to File ICAO (ATS) Flight plan Submission of the ICAO (ATS) Flight plan **National Procedures** National rules and procedures
8	**Aircraft General Knowledge** **The Airframe** Airframe design and construction Serviceability checks **Flying Controls** Flying control design and construction Serviceability checks **Undercarriage** Undercarriage design and construction Tyres and brakes Serviceability checks **Piston Engines** Principles of operation Piston engine design and components Serviceability checks **Piston Engine Systems** Fuel system Induction system Ignition system Oil system Cooling system

	Other engine systems **The Propeller** Principles of operation Propeller design and components Propeller handling Serviceability checks **Engine Handling** Engine limitations Engine handling **The Electrical System** Principles of operation Electrical system design and components **Instruments and Systems** The pitot static system The altimeter The vertical speed indicator The air speed indicator The suction system Attitude indicator Heading indicator The turn indicator / turn co-ordinator The compass Other instrumentation Integrated electronic displays **Avionics Systems** Communications Equipment SSR ADF VOR DME GNSS Integrated Electronic Displays **Cockpit Equipment and Systems** Doors, windows and exits Seats Seat belts and harnesses Cockpit heating and ventilation systems **Emergency Equipment** First aid kit Fire extinguishers ELT/PLB Lifejackets and life rafts Other survival equipment

	Aircraft Airworthiness Aircraft registration Airworthiness Certificate, Permit to Fly **Aeroplane Flight Manual/Pilot Operating Handbook** Aircraft maintenance and serviceability Maintenance and serviceability documentation **Converting Onto a Another Aircraft Type** Practical considerations when converting onto a different aircraft and/or variants **National Procedures** National rules and procedures
9	**Navigation** **Form of the Earth** Latitude and Longitude **Measurement of Direction** True direction Magnetic direction Compass direction **Measurement of Distance** Units of distance Conversion of units **Measurement of Airspeed** Calculation of true airspeed **Triangle of Velocities** Calculating heading and groundspeed **In-flight VFR Navigation: Dead Reckoning and Map Reading** Principles of dead reckoning Time and distance Map reading **In-flight VFR Navigation: Off-track and Diversion** Off track correction ETA revision Diversion Alternate airfields **In-flight VFR Navigation: Vertical Navigation** Safety altitudes Vertical navigation Altimeter settings

	In-flight VFR Navigation: Controlled and Notified Airspace Procedures in the vicinity of controlled and notified airspace Procedures within controlled and notified airspace Airspace infringement **Time** UTC Time Zones Sunrise and sunset information **VFR Radio Navigation** Integrating radio navigation with VFR navigation VDF – Operation and interpretation, limitations and accuracy ATC Radar – Operation and interpretation, limitations and accuracy ADF – Operation and interpretation, limitations and accuracy VOR – Operation and interpretation, limitations and accuracy DME – Operation and interpretation, limitations and accuracy GNSS – operation and interpretation, limitations and accuracy

Flight Training Syllabus

AltMoC 1 FCL.110.A LAPL(A) - Experience requirements and crediting

Flight Instruction for the LAPL(A)

Entry to training

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

Flight instruction

1. The LAPL(A) flight instruction syllabus takes into account the principles of threat and error management.
2. Before authorising the applicant for a LAPL(A) to undertake his/her first solo flight, the FI should ensure that the applicant can operate the required systems and equipment and is proficient in the use of R/T communication.
3. Use of Basic Instrument Training Devices (BITD) (and higher level simulators):
   a) A BITD may be used for flight training for:
      i. navigation using radio navigation aids;
   b) The use of the BITD should be subject to the following:
      i. the training should be complemented by exercises in an aeroplane;
      ii. the record of the parameters of the BITD flight must be maintained.;
      iii. an FI(A) or STI(A) should provide the instruction.

Syllabus of flight instruction

1. The numbering of exercises should be used primarily as a reference list and as a broad instructional sequencing guide; therefore the demonstrations and practices need not necessarily be carried out in the order listed. The actual order and content will depend upon the following interrelated factors:
   a) the applicant's progress and ability;
   b) the weather conditions affecting the flight;
   c) the flight time available;
   d) instructional technique considerations;
   e) the local operating environment;
   f) applicability of the exercises to the aeroplane or TMG type.
2. The need for the applicant to practice good airmanship and maintain a good look-out, should be emphasised throughout.

Exercise 1a Aeroplane or TMG Familiarisation

Aircraft Construction and characteristics
Normal exits
Cockpit layout
Aircraft systems
Use of checklist and Pilot's Operating Handbook/Flight Manual

Exercise 1e Emergency and Abnormal Procedures

Fire on the ground
Cockpit fire in the air
Engine fire in the air
Systems failures
Emergency equipment and drills, emergency exits

Exercise 2 Preparations for Flight & Actions after Flight

Personal preparation
Flying equipment required
Weather forecasts and actual reports
NOTAMs and AIS information
Flight authorisation, aircraft serviceability and acceptance
Booking out procedures
Airfield sense
Refuelling procedures
External checks
Internal checks
Seat, harness and rudder adjustment
Starting
Power and pre take off checks
Local procedures
Shut down checks
Parking, moving, security and tie down

Exercise 3 The Air Experience Flight

The air experience flight

Exercise 4 Effects of Controls

Primary effects of the flying controls
Further effects of the flying controls
Effect of air speed
Effect of propeller slipstream
Effect of power
Effect of trimming controls
Effect of flaps
Effect of other controls (as applicable)
Operation of the carburettor heat control (as applicable)
Operation of the mixture control (as applicable)
Operation of the cockpit heating and ventilation controls (as applicable)
Operation of other controls (as applicable)

Exercise 5a Taxiing

- Pre taxi checks
- Moving off, speed control and stopping
- Engine handling
- Control of direction
- Parking area procedures, taxiing in confined spaces
- Effect of wind and use of the flying controls
- Effects of ground surface
- Rudder check
- Instrument checks
- Apron and manoeuvring area markings
- Marshalling signals
- ATC procedures

Exercise 5e Taxiing Emergency and Abnormal Procedures

- Steering failure
- Brake failure
- Emergency stop

Exercise 6 Straight & Level Flight

- Lookout technique
- Attaining and maintaining straight and level flight
- Demonstration of stability
- Straight and level flight at an increased airspeed
- Straight and level flight at a decreased airspeed
- Maintaining straight and level flight during configuration changes

Exercise 7 Climbing

- Entering the climb
- Maintaining the climb
- Levelling off at a selected level
- Climbing with flap extended
- The en route (cruise) climb
- Maximum angle of climb

Exercise 8 Descending

- Entering the descent
- Maintaining the descent
- Levelling off at a selected level
- Descending with flap (or spoilers, airbrakes or speedbrakes, as applicable)
- Descending with power
- Descending with flap and power
- The en route (cruise) descent
- Sideslipping
- Entering a climb from the descent (go-around)

Exercise 9 Turning

Entering the level turn
Maintaining the level turn
Returning to straight flight
The climbing turn
The descending turn
Turning on to selected headings

Exercise 10a Slow Flight

Safety checks
Introduction to slow flight
Controlled flight slowing to critically slow airspeed
Co-ordinated use of controls at critically slow airspeed
Recovery from a critically slow airspeed

Exercise 10b Stalling

Safety checks
Symptoms and recognition of the stall
The clean stall and recovery with and without power
Stall recovery during a wing drop
The stall and recovery with power and/or flap (or spoilers, airbrakes or speedbrakes, as applicable)
The approach to the stall and recovery in the approach configuration
The approach to the stall and recovery in the landing configuration
The approach to the stall and recovery in the take off configuration
Stall and incipient stall and recovery in different configurations and various manoeuvres

Exercise 11 Spin Avoidance

Safety checks
Recognition of the incipient spin
Recovery from the incipient spin

Exercise 12a Take-Off and Climb

Pre take-off checks
Checks during and after take-off and climb
Standard take off and initial climb
Crosswind take off
Short field and soft field take off
Noise abatement
ATC procedures

Exercise 12e Emergency and Abnormal Procedures

Abandoned take off
Engine failure after take off

Exercise 13a Circuit, Approach and Landing

Joining the circuit
Circuit pattern and procedures
Pre landing checks
Initial approach to land
Normal (performance) landing
Touch and go
Effect of surface wind
Crosswind circuit, approach and landing
Glide approach and landing
Flapless approach and landing
Short field and soft field approach and landing
Missed approach and go around
Bad weather circuit and landing
Noise abatement
ATC procedures

Exercise 13e Emergency and Abnormal Procedures

Engine failure in the circuit
Systems failures
Misjudged landing

Exercise 14 First Solo and Solo Consolidation

First solo

During flights immediately following the solo circuit consolidation, the following should be revised:
Leaving the circuit
Local area procedures, map reading
Cruise checks
Use of the compass
Use of radio navigation aids for homing
Re joining the circuit

Exercise 15 Advanced Turning

Entering the steep turn (minimum 45° angle of bank)
Maintaining the steep turn
Returning to straight and level flight
Steep descending turn
Approach to the stall in the turn
Recognition of and recovery from the spiral dive
Recovery from other unusual attitudes

Exercise 16 Forced Landing without Power

- Forced landing procedure
- Assessing the surface wind
- Assessing the gliding range
- Selecting a suitable landing area
- Planning the approach path, provision for change of plan
- Engine failure checks and restarting procedures
- Use of the radio
- Committal/pre landing checks and actions
- Final approach and landing
- Actions after landing

Exercise 17 Precautionary Landing

- Situations necessitating a precautionary landing
- Precautionary landing procedure
- Selection of landing area
- Surrounding area and landing site inspection
- Approach and landing
- Actions after landing

Exercise 18a VFR Navigation - Flight Planning

- Route selection
- Controlled and regulated (notified) airspace
- Chart selection and preparation
- Safety altitude/minimum safety altitude (MSA)
- Weather forecasts and actual reports
- Daylight (sunrise and sunset)
- Completion of the flight log, navigation calculations
- Fuel planning
- Mass and balance calculation
- Performance calculations
- Alternate airfields
- Radio frequencies
- NOTAMS and AIS information
- Aircraft documentation
- Flight notification

Exercise 18a VFR Navigation - Departure and En Route Procedures

- Airfield departure procedures
- Air Traffic Service and radio procedures
- Departing non-controlled aerodromes (as applicable)
- Departing controlled aerodromes and controlled (notified) airspace
- Altimeter setting procedures
- Principles of map reading
- Maintaining airspeed, altitude and heading
- Maintaining flight log
- Assessing weather en route, weather minima
- Revision of ETA and heading
- Monitoring fuel state and systems
- Turning point procedure

Transiting controlled (notified) airspace
Organising cockpit workload

Exercise 18a VFR Navigation - Arrival Procedures

ATC and radio procedures
Arriving at non-controlled aerodromes (as applicable)
Arriving at controlled aerodromes and controlled (notified) airspace
Altimeter setting procedures
Circuit joining procedures
Parking and aircraft security
Refuelling
Notification of arrival, administration procedures

Exercise 18b VFR Navigation at Lower Levels and in Degraded Visual Environment (DVE)

Actions before descending or entering DVE
Appropriate aeroplane configuration
Hazards, obstacles and terrain
Map reading at lower level and in DVE
Visual impressions of flight at minimum level
Visual impressions of flight in DVE
Effect of wind, turbulence and windshear
Vertical situational awareness
Weather considerations and assessing weather
Noise sensitive areas

Exercise 18c VFR Radio Navigation (Basics)

Pre flight radio navigation preparation
Integrating radio navigation into VFR navigation
Basic use of GNSS or VOR/ADF *
Basic use of VDF *
Basic use of ATC radar *
Secondary Surveillance Radar (SSR) – Transponder operation *

* Specific radio navigation aids as applicable depending on aircraft equipment and ATC facilities

Exercise 18e Emergency and Abnormal Procedures

Diversion procedure
Uncertain of position and lost procedures
Loss of sight of the surface
Electrical failure
Radio failure
Instrument failure
Systems failure

Exercise 19 Stopping and restarting the engine (TMG only)

Engine cooling
In-flight engine stopping and restarting procedure

Contact details

1.10 Any queries or requests for further guidance by training organisations or facilities should be addressed to your allocated Licensing Standards Inspector.

Alternatively please contact:
General Aviation Unit
Civil Aviation Authority
GE, Aviation House
Gatwick Airport
RH6 0YR

Or e-mail **sargga@caa.co.uk**