European Aviation Safety Agency

9 Apr 2010

COMMENT RESPONSE DOCUMENT (CRD) TO NOTICE OF PROPOSED AMENDMENT (NPA) 2008-17B

for an Agency Opinion on a Commission Regulation establishing the Implementing Rules for the licensing of pilots

and

a draft Decision of the Executive Director of the European Aviation Safety Agency on Acceptable Means of Compliance and Guidance Material on the licensing of pilots

"Implementing Rules for Pilot Licensing"

b.3 – AMC to Part-FCL

The changes as compared to the text proposed in the NPA are shown as follows:

- deleted text is shown with a strike through: ~~deleted~~
- new text is shown in bold: **bold**

II Draft Decision AMC and GM for Part-FCL

Acceptable Means of Compliance and Guidance material

to

Part-FCL

SUBPART A

GENERAL REQUIREMENTS

GM No 1 to FCL.010

Definitions and Abbreviations

A. Interpretative material

1. Whenever licences, ratings, approvals or certificates are mentioned in Part-FCL, these are meant to be **valid** licences, ratings, approvals or certificates issued in accordance with Part-FCL. In all other cases these documents are specified as e.g. ICAO or national~~-~~ licences.
2. Whenever a reference is made to Member State for the purpose of mutual recognition of licences, ratings, approvals or certificates, this means a~~n~~ European Union Member State and States associated to EASA in accordance with article 55 of the Basic Regulation.

~~B. Definitions~~

~~Airmanship~~

~~The consistent use of good judgement and well-developed knowledge, skills and attitudes to accomplish flight objectives.~~

~~Competency element~~

~~An action that constitutes a task that has a triggering event and a terminating event that clearly defines its limits, and an observable outcome.~~

~~Competency unit~~

~~A discrete function consisting of a number of competency elements.~~

~~Credit~~

~~Recognition of alternative means or prior qualifications.~~

~~Error~~

~~An action or inaction by the flight crew that leads to deviations from organizational or flight intentions or expectations.~~

~~Error management~~

~~The process of detecting and responding to errors with countermeasures that reduce or eliminate the consequences of errors, and mitigate the probability of errors or undesired aircraft states.~~

~~Instrument time~~

~~Instrument flight time or instrument ground time.~~

~~*Multi-pilot operation*~~

~~— An operation approved by the Authority requiring at least two pilots using multi-crew co-operation on multi-pilot helicopters.~~

~~*Other training devices*~~

~~— Training aids other than flight simulators, flight training devices or flight and navigation procedures trainers which provide means for training where a complete flight deck environment is not necessary.~~

~~*Performance criteria*~~

~~A simple, evaluative statement on the required outcome of the competency element and a description of the criteria used to judge if the required level of performance has been achieved.~~

~~*Private pilot*~~

~~A pilot who holds a licence which prohibits the piloting of aircraft in operations for which remuneration is given.~~

~~*Proficiency checks*~~

~~— Demonstrations of skill to revalidate or renew ratings, and including such oral examination as the examiner may require.~~

~~*Renewal (of e.g. a rating or approval)*~~

~~— The administrative action taken after a rating or approval has lapsed that renews the privileges of the rating or approval for a further specified period consequent upon the fulfilment of specified requirements.~~

~~*Revalidation (of e.g. a rating or approval)*~~

~~— The administrative action taken within the period of validity of a rating or approval that allows the holder to continue to exercise the privileges of a rating or approval for a further specified period consequent upon the fulfilment of specified requirements.~~

~~*Skill tests*~~

~~Skill tests are demonstrations of skill for licence or rating issue, including such oral examination as the examiner may require.~~

~~*Student pilot-in-command (SPIC)*~~

~~Flight time during which the flight instructor will only observe the student acting as pilot-in-command and shall not influence or control the flight of the aircraft.~~

~~*Threat*~~

~~Events or errors that occur beyond the influence of the flight crew, increase operational complexity and which must be managed to maintain the margin of safety.~~

~~*Threat management*~~

~~The process of detecting and responding to the threats with countermeasures that reduce or eliminate the consequences of threats, and mitigate the probability of errors or undesired aircraft states.~~

B~~C~~. Abbreviations

A	Aeroplane
A/C	Aircraft
AIS	Aeronautical Information Services

AMC	Acceptable Means of Compliance
AeMC	Aeromedical Centre
AME	~~Authorised~~ **Aero** Medical Examiner
APU	**Auxiliary Power Unit**
As	Airship
ATC	Air Traffic Control
ATO	Approved Training Organisation
ATP	Airline Transport Pilot
ATPL	Airline Transport Pilot Licence
ATS	**Air Traffic Service**
B	Balloon
BPL	Balloon Pilot Licence
CFI	Chief Flying Instructor
CS	**Certification Specification**
CG	**Centre of Gravity**
CGI	Chief Ground Instructor
CP	Co-pilot
CPL	Commercial Pilot Licence
CRE	Class Rating Examiner
CRI	Class Rating Instructor
CRM	Crew Resource Management
CQB	Central Question Bank
DR	**Dead Reckoning navigation**
FCL	Flight Crew Licensing
FE	Flight Examiner
F/E	Flight Engineer
FI	Flight Instructor
FIE	Flight Instructor Examiner
FMS	**Flight Management System**
FNPT	Flight and Navigation Procedures Trainer
FS	Flight Simulator
FTD	Flight Training Device

H	Helicopter
HPA	High Performance Aeroplane
HT	Head of Training
ICAO	International Civil Aviation Organisation
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Conditions
IR	Instrument Rating
IRE	Instrument Rating Examiner
IRI	Instrument Rating Instructor
LAFI	**Light Aircraft Flight Instructor**
L**A**PL	~~Leisure~~ **Light Aircraft** Pilot Licence
LOFT	Line Orientated Flight Training
MCC	Multi**-**Crew Cooperation
ME	Multi-engine
MEL	Minimum Equipment List
MEP	Multi-engine Piston
MET	Multi-engine Turbo-prop
MI	**Mountain rating instructor**
MP	**Multi-pilot**
MPA	Multi-pilot Aeroplane
MPL	Multi-crew Pilot Licence
MPH	Multi-pilot Helicopter
NDB	**Non-directional beacon**
nm	Nautical Miles
OML	Operational Multi-~~crew~~ **pilot** Limitation
OSL	Operational Safety Pilot Limitation
OTD	Other Training Devices
PF	Pilot Flying
PIC	Pilot-In-Command
PICUS	Pilot-In-Command Under Supervision
PL	Powered-lift
PNF	Pilot Not Flying
PPL	Private Pilot Licence

RNAV	**Radio navigation**
R/T	Radiotelephony
S	**Sailplane**
SE	Single-engine
SEP	Single-engine Piston
SET	Single-engine Turbo-prop
SFE	Synthetic Flight Examiner
SFI	Synthetic Flight Instructor
SP	**Single-pilot**
SPA	Single-pilot Aeroplane
SPH	Single-pilot Helicopter
SPIC	Student Pilot-In-Command
SPL	Sailplane Pilot Licence
STD	Synthetic Training Devices
STI	Synthetic Training Instructor
TEM	Threat and Error Management
TMG	Touring Motor Glider
TR	Type Rating
TRE	Type Rating Examiner
TRI	Type Rating Instructor
V_1	**Speed for take-off**
VFR	Visual Flight Rules
VHF	**Very high frequency**
VMC	Visual Meteorological Conditions
VOR	**VHF unidirectional range**
ZFTT	Zero Flight Time Training

AMC No 1 to FCL.015

Application for the issue of licences, ratings and certificates — Application and report forms

1. Common application and report forms can be found:

1.1 For skill tests/proficiency checks for issue/revalidation/renewal of LAPL/PPL/BPL/SPL/IR, in AMC No 1 to Appendix 7

1.2 For skill tests/proficiency checks for ATPL/MPL/type ratings, in AMC No 1 to Appendix 9

1.3 For assessments of competence for instructors, in AMC No 5 to FCL.930.

AMC No 1 to FCL.025

Theoretical knowledge examinations for the issue of licences — Terminology

The meaning of the following terms used in this paragraph should be as follows:

1. **Entire set of examinations: an examination in all subjects required by the licence level.**
2. **Examination: the demonstration of knowledge in 1 or more examination papers.**
3. **Examination paper: a set of questions to be answered by a candidate for examination.**
4. **Attempt: a try to pass a specific paper.**
5. **Sitting: a period of time established by the competent authority within which a candidate can take an examination. This period should not exceed 10 consecutive working days.**

AMC No 1 to FCL.050

Recording of flight time

1. The record of the flights flown should contain at least the following information:
   - 1.1 Personal details**:** Name and address of the pilot;
   - 1.2 For each flight:
     - (a) Name of Pilot-in-command;
     - (b) Date of flight;
     - (c) Place and time of departure and arrival;
     - (d) Type, including make, model and variant, and registration of the aircraft;
     - (e) Indication if the aircraft is single-engine or multi-engine;
     - (f) Total time of flight;
     - (g) Accumulated total time of flight**.**
   - 1.3 For each flight simulator or FNPT session:
     - (a) Type and qualification number of the training device;
     - (b) Synthetic training device instruction;
     - (c) Date;
     - (d) Total time of session;
     - (e) Accumulated total time**.**
   - 1.4 Details on pilot function, namely pilot-in-command, including solo, student pilot-in-command and pilot-in-command under supervision time, co-pilot, dual, flight instructor or flight examiner**.**
   - 1.5 Operational conditions, namely if the operation takes place at night, or is conducted under instrument flight rules.

2. Logging of time

2.1. Pilot-in-command flight time

(a**)** The holder of a licence may log as pilot-in-command time all of the flight time during which he**/she** is the pilot-in-command.

(b**)** The applicant for or the holder of a pilot licence may log as pilot-in-command time all solo flight time**,** ~~and~~ flight time as student pilot-in-command **and flight time under supervision** provided that such SPIC time **and flight time under supervision are** ~~is~~ countersigned by the instructor.

(c**)** The holder of an instructor certificate may log as pilot-in-command all flight time during which he/she acts as an instructor in an aircraft..

(d**)** The holder of an examiner's certificate may log as pilot-in-command all flight time during which he/she occupies a pilot's seat and acts as an examiner in an aircraft.

(e**)** A co-pilot acting as pilot-in-command under supervision on an aircraft on which more than one pilot is required under the type certification of the aircraft or as required by Part-OPS provided such pilot-in-command time under supervision is countersigned by the pilot-in-command.

(f**)** If the holder of a licence carries out a number of flights upon the same day returning on each occasion to the same place of departure and the interval between successive flights does not exceed ~~thirty~~ **30** minutes, such series of flights may be recorded as a single entry.

2.2. Co-pilot flight time. The holder of a pilot licence occupying a pilot seat as co-pilot may log all flight time as co-pilot flight time on an aircraft on which more than one pilot is required under the type certification of the aircraft, or the regulations under which the flight is conducted.

2.3. Cruise relief co-pilot flight time. A cruise relief co-pilot ~~pilot~~ may log all flight time as co-pilot when occupying a pilot's seat.

2.4. Instruction time. A summary of all time logged by an applicant for a licence or rating as flight instruction, instrument flight instruction, instrument ground time, etc.**,** may be logged if certified by the appropriately rated and/or authorised instructor from whom it was received.

2.5. PICUS (Pilot-in-command under supervision). Provided that the method of supervision is acceptable to the authority, a co-pilot may log as PIC flight time flown as PICUS~~,~~ when all ~~of~~ the duties and functions of PIC on that flight were carried out~~,~~ **in** such **a way** that the intervention of the PIC in the interest of safety was not required.

3. Format of the record

3.1 Details of flights flown under commercial air transport may be recorded in a computerised format maintained by the operator. In this case an operator should make the records of all flights operated by the pilot, including differences and familiarisation training, available **up**on request to the flight crew member concerned.

3.2 For other types of flight, the pilot should record the details of the flights flown in the following logbook format.

PILOT LOGBOOK

Holder's name

Holder's licence number

HOLDER'S ADDRESS:	
___________________________________ ___________________________________ ___________________________________	___________________________________ ___________________________________ ___________________________________ *[space for address change]*
___________________________________ ___________________________________ ___________________________________ *[space for address change]*	___________________________________ ___________________________________ ___________________________________ *[space for address change]*
___________________________________ ___________________________________ ___________________________________ *[space for address change]*	___________________________________ ___________________________________ ___________________________________ *[space for address change]*

1	2		3		4		5				6		7	8	
DATE (dd/mm/yy)	DEPARTURE		ARRIVAL		AIRCRAFT		SINGLE-PILOT TIME		MULTI-PILOT TIME		TOTAL TIME OF FLIGHT		NAME PIC	LANDINGS	
	PLACE	*TIME*	*PLACE*	*TIME*	*MAKE, MODEL, VARIANT*	*REGISTRATION*	*SE*	*ME*						*DAY*	*NIGHT*
							TOTAL THIS PAGE								
							TOTAL FROM PREVIOUS PAGES								
							TOTAL TIME								

9				10								11				12
OPERATIONAL CONDITION TIME				PILOT FUNCTION TIME								SYNTHETIC TRAINING DEVICES SESSION				REMARKS AND ENDORSEMENTS
NIGHT		*IFR*		*PILOT-IN-COMMAND*		*CO-PILOT*		*DUAL*		*INSTRUCTOR*		*DATE (dd/mm/yy)*	*TYPE*	*TOTAL TIME OF SESSION*		
																I certify that the entries in this log are true.
TOTAL THIS PAGE																
TOTAL FROM PREVIOUS PAGES																**PILOT'S SIGNATURE**
TOTAL TIME																

INSTRUCTIONS FOR USE

1. FCL.050 requires holders of a pilot licence to record details of all flights flown. This logbook enables pilot licence holders to record flying experience in a manner which will facilitate this process while providing a permanent record of the licence holders flying. Pilots who fly regularly aeroplanes and helicopters or other aircraft ~~types~~ **categories** are recommended to maintain separate logbooks for each ~~type of flying~~**aircraft category**.
2. Flight crew logbook entries should be made as soon as practicable after any flight undertaken. All entries in the logbook should be made in ink or indelible pencil.
3. The particulars of every flight in the course of which the holder of a flight crew licence acts as a member of the operating crew of an aircraft are to be recorded in the appropriate columns using one line for each flight, provided that if an aircraft carries out a number of flights upon the same day returning on each occasion to the same place of departure and the interval between successive flights does not exceed ~~thirty~~ **30** minutes, such series of flights may be recorded as a single entry.
4. Flight time is recorded:

   (i) for aeroplanes, touring motor gliders and powered-lift, from the moment an aircraft first moves for the purpose of taking off until the moment it finally comes to rest at the end of the flight**;**

   (ii) for helicopters, from the moment a helicopter's rotor blades start turning until the moment the helicopter finally comes to rest at the end of the flight, and the rotor blades are stopped**;**

   (iii) for airships, from the moment an airship is released from the mast for the purpose of taking off until the moment the airship finally comes to rest at the end of the flight, and is secured on the mast**;**

   (iv) for sailplanes, the total time from the moment the sailplane commences the ground run in the process of taking off until the moment the sailplane finally comes to a rest at the end of flight;

   (v) for balloons, the total time from the moment the basket leaves the ground for the purpose of taking off until the moment it finally comes to a rest at the end of the flight.
5. When an aircraft carries two or more pilots as members of the operating crew, one of them shall, before the flight commences, be designated by the operator as the aircraft pilot-in-command, in accordance with Part-OPS, who may delegate the conduct of the flight to another suitabl~~e~~**y** qualified pilot. All flying carried out as pilot-in-command is entered in the log~~-~~book as 'pilot-in-command'. A pilot flying as 'pilot-in-command under supervision' or 'student pilot-in-command' enters flying time~~s~~ as 'pilot-in-command' but all such are certified by the pilot-in-command or flight instructor in the 'Remarks' column of the logbook.
6. **Notes on recording of flight time:**
   - Column 1: enter date (dd/mm/yy) on which the flight commences.
   - Column 2/3: enter place of departure and destination either in full or the internationally recognised three or four letter designator. All times should be UTC.
   - Column 5: indicate whether the operation was single or multi-pilot, and for single-pilot operation whether single or multi-engine.

Example:

1	2		3		4		5				6		7	8	
DATE (dd/mm/yy)	DEPARTURE		ARRIVAL		AIRCRAFT		SINGLE PILOT TIME		MULTI-PILOT TIME		TOTAL TIME OF FLIGHT		NAME PIC	LANDINGS	
	PLACE	*TIME*	*PLACE*	*TIME*	*MAKE, MODEL, VARIANT*	*REGISTRATION*	*SE*	*ME*						*DAY*	*NIGHT*
14/11/98	LFAC	1025	EGBJ	1240	PA34-250	G-SENE		✓			2	15	SELF	1	
15/11/98	EGBJ	1810	EGBJ	1930	C152	G-NONE	✓				1	20	SELF		2
22/11/98	LGW	1645	LAX	0225	B747-400	G-ABCD			9	40	9	40	SPEAKIN		1

- Column 6: total time of flight may be entered in hours and minutes or decimal notation as desired.
- Column 7: enter name of pilot-in-command or SELF as appropriate.
- Column 8: indicate number of landings as pilot flying by day and/or night.
- Column 9: enter flight time undertaken at night or under instrument flight rules if applicable.
- Column 10: Pilot function time:
  - enter flight time as pilot-in-command (PIC), student pilot-in-command (SPIC) and pilot-in-command under supervision (PICUS) as PIC**,**
  - all time recorded as SPIC or PICUS is countersigned by the aircraft pilot-in-command/flight instructor in the Remarks (column 12)**,**
  - instructor time should be recorded as appropriate and also entered as PIC.
- Column 11: Flight Simulator (FS) or Flight Navigation Procedures Trainer (FNPT):
  - for FS enter type of aircraft and qualification number of the device. For other flight training devices enter either FNPT I or FNPT II as appropriate.

Total time of session includes all exercises carried out in the device, including pre- and after-flight checks.

Enter type of exercise performed in the Remarks (column 12), e.g. operator proficiency check, revalidation.

- Column 12: the Remarks column may be used to record details of the flight at the holder's discretion. The following entries, however, should always be made:

  - instrument flight time undertaken as part of **the** training for a licence or rating**,**
  - details of all skill tests and proficiency checks**,**
  - signature of PIC if the pilot is recording flight time as SPIC or PICUS**,**
  - signature of instructor if flight is part of a single-engine piston or touring motor glider class rating revalidation**.**

7. When each page is completed, accumulated flight time**/hours** should be entered in the appropriate columns and certified by the pilot in the Remarks column.

Example:

9				**10**								**11**				**12**
OPERATIONAL CONDITION TIME				PILOT FUNCTION TIME								SYNTHETIC TRAINING DEVICES SESSION				REMARKS AND ENDORSEMENTS
NIGHT		*IFR*		*PILOT-IN-COMMAND*		*CO-PILOT*		*DUAL*		*INSTRUCTOR*		*DATE (dd/mm/yy)*	*TYPE*	*TOTAL TIME OF SESSION*		
		2	15	2	15											
1	20			1	20					1	20					Night rating training (A L Pilot)
												20/11/98	B747-400 (Q1234)	4	10	Revalidation Prof Check
8	10	9	40	9	40											PIC(US) C Speaking

AMC No 1 to FCL.055

Language proficiency

1. The language proficiency assessment should be designed to reflect a range of tasks undertaken by pilots but with ~~the~~ specific focus on language rather than operational procedures.
2. The assessment should determine the applicant's ability to:

   (a) communicate effectively using standard radiotelephony phraseology; and

   (b) deliver and understand messages in plain language in both usual and unusual situations that necessitate departure from standard radiotelephony phraseology.

Refer to the 'Manual on the Implementation of ICAO Language Proficiency Requirements' (ICAO Doc 9835), Appendix A Part III and Appendix B for further guidance.

ASSESSMENT

3. The assessment may be subdivided into three elements, as follows:

   (a) Listening **—** assessment of comprehension**;**

   (b) Speaking **—** assessment of pronunciation, fluency, structure and vocabulary

   (c) Interaction

      (i) ~~3.1~~ The three elements mentioned above may be combined and they can be covered by using a wide variety of means/technologies.

      (ii) ~~3.2~~ Where appropriate, some or all of these elements may be achieved through the use of the radiotelephony testing arrangements.

      (iii) ~~3.3~~ When the elements of the testing are assessed separately, the final assessment should be consolidated in the language proficiency endorsement issued by the authority.

      (iv) ~~3.4~~ The assessment may be conducted during one of the several existing checking or training activities, such as licence issue or rating issue and revalidation, line training, operator line checks or proficiency checks.

4. The authority may use its own resources in developing or conducting the language proficiency assessment, or may delegate this task to language assessment bodies.

5. The authority should establish an appeal procedure for applicants.

6. The licence holder should receive a statement containing the level and validity of the language endorsements**.**

7**.** Where the assessment method for **the** English language established by the competent authority ~~are~~**is** equivalent to th~~ose~~**at** established for the assessment of use of **the** English language in accordance with AMC No 2 to FCL.055, the same assessment may be used for both purposes.

BASIC ASSESSMENT REQUIREMENTS

8. The aim of the assessment is to determine the ability of an applicant for a pilot licence or a licence holder to speak and understand the language used for radiotelephony communications.

   8.1 The assessment should determine the ability of the applicant to use both:

— standard radiotelephony phraseology, and

— plain language, in situations when standardised phraseology cannot serve an intended transmission.

8.2 The assessment should include:

— voice-only and/or face-to-face situations,

— common, concrete and work-related topics for pilots.

8.3 The applicants should demonstrate their linguistic ability in dealing with an unexpected turn of events, and in solving apparent misunderstandings.

8.4 The assessment should determine the applicant's speaking and listening abilities. Indirect assessments, of grammatical knowledge, reading and writing, are not appropriate.

8.5 The assessment should determine the language skills of the applicant in the following -areas:

(a**)** Pronunciation:

— the extent to which the pronunciation, stress, rhythm and intonation are influenced by the applicant's first language or national variations÷, and

— how much they interfere with ease of understanding.

(b**)** Structure:

— the ability of the applicant to use both basic and complex grammatical structures, and

— the extent to which the applicant's errors interfere with the meaning.

(c**)** Vocabulary:

— the range and accuracy of the vocabulary used÷, and

— the ability of the applicant to paraphrase successfully when lacking vocabulary.

(d**)** Fluency:

— tempo,

— hesitancy,

— rehearsed versus spontaneous speech,

— use of discourse markers and connectors.

(e**)** Comprehension:

— on common, concrete and work-related topics, and

— when confronted with a linguistic or situational complication or an unexpected turn of events.

NOTE: The accent or variety of accents used in the test material should be sufficiently intelligible for an international community of users.

(f**)** Interactions

— quality of response (immediate, appropriate, and informative),

— the ability to initiate and maintain exchanges:

  - on common, concrete and work-related topics**,** and
  - when dealing with an unexpected turn of events**,**

— the ability to deal with apparent misunderstandings by checking, confirming or clarifying.

NOTE: The assessment of the language skills in the areas mentioned above is conducted using the Rating Scale ~~bellow~~**in AMC No 2 to FCL.055**.

8.6 When the assessment is not conducted in a face-to-face situation, it should use appropriate technologies for the assessment of the applicant's abilities in listening and speaking, and for enabling interactions (for example: simulated pilot/controller communication).

ASSESSORS

9. It is essential that the persons responsible for language proficiency assessment ('assessors') are suitably trained and qualified. They should be either aviation specialists (i.e. current or former flight crew members or air traffic controllers), or language specialists with additional aviation-related training. An alternative approach would be to form an assessment team consisting of an operational expert and a language expert.

9.1 The assessors should be trained on the specific requirements of the assessment.

9.2 Assessors should not test applicants to whom they have given language training.

CRITERIA FOR THE ACCEPTABILITY OF LANGUAGE ASSESSMENT BODIES

10. In order to ensure an impartial assessment process, the language assessment should be independent of the language training.

10.1 In order to be accepted, the language assessment bodies should demonstrate:

a. Appropriate management and staffing, and

b. Quality System established and maintained to ensure compliance with, and adequacy of, assessment requirements, standards and procedures.

10.2 The Quality system established by a language assessment body should address the following:

a. Management

b. Policy and strategy

c. Processes

d. The relevant provisions of ICAO/~~JAR~~**Part**-FCL, standards and assessment procedures

e. Organisational structure

f. Responsibility for the development, establishment and management of the Quality System

g. Documentation

h. Quality Assurance Programme

i. Human Resources and training (initial, recurrent)

j. Assessment requirements

k. Customer satisfaction

10.3 The assessment documentation and records should be kept for a period of time determined by the Authority and made available to the Authority, on request.

10.4 The assessment documentation should include at least the following:

a. Assessment objectives

b. Assessment layout, time scale, technologies used, assessment samples, voice samples

c. Assessment criteria and standards (at least for the levels 4, 5 and 6 of the Rating Scale bellow)

d. Documentation demonstrating the assessment validity, relevance and reliability

e. Assessment procedures and responsibilities

- Preparation of individual assessment
- Administration: location(s), identity check and invigilation, assessment discipline, confidentiality/security
- Reporting and documentation provided to the Authority and/or to the applicant, including sample certificate
- Retention of documents and records

NOTE: Refer to the 'Manual on the Implementation of ICAO Language Proficiency Requirements' (ICAO Doc 9835) for further guidance.

AMC No 2 to FCL.055

Language Proficiency - Rating Scale

The following table describes the different levels of language proficiency.

LEVEL	*PRONUNCIATION* *Assumes a dialect and/or accent intelligible to the aeronautical community*	*STRUCTURE* *Relevant grammatical structures and sentence patterns are determined by language functions appropriate to the task*	*VOCABULARY*	*FLUENCY*	*COMPREHENSION*	*INTERACTIONS*
Expert (Level 6)	**Pronunciation, stress, rhythm, and intonation, though possibly influenced by the first language or regional variation, almost never interfere with ease of understanding.**	**Both basic and complex grammatical structures and sentence patterns are consistently well controlled.**	**Vocabulary range and accuracy are sufficient to communicate effectively on a wide variety of familiar and unfamiliar topics. Vocabulary is idiomatic, nuanced and sensitive to register.**	**Able to speak at length with a natural, effortless flow. Varies speech flow for stylistic effect, e.g. to emphasize a point.** **Uses appropriate discourse markers and connectors spontaneously**	**Comprehension is consistently accurate in nearly all contexts and includes comprehension of linguistic and cultural subtleties.**	**Interacts with ease in nearly all situations. Is sensitive to verbal and non-verbal cues, and responds to them appropriately.**
Extended (Level 5)	**Pronunciation, stress, rhythm, and intonation, though influenced by the**	**Basic grammatical structures and sentence patterns are**	**Vocabulary range and accuracy are sufficient to communicate effectively on**	**Able to speak at length with relative ease on familiar topics, but may not vary**	**Comprehension is accurate on common, concrete, and work related**	**Responses are immediate, appropriate, and informative. Manages the**

LEVEL	***PRONUNCIATION*** ***Assumes a dialect and/or accent intelligible to the aeronautical community***	***STRUCTURE*** ***Relevant grammatical structures and sentence patterns are determined by language functions appropriate to the task***	***VOCABULARY***	***FLUENCY***	***COMPREHENSION***	***INTERACTIONS***
	first language or regional variation, rarely interfere with ease of understanding.	**consistently well controlled. Complex structures are attempted but with errors which sometimes interfere with meaning.**	**common, concrete, and work related topics. Paraphrases consistently and successfully. Vocabulary is sometimes idiomatic.**	**speech flow as a stylistic device. Can make use of appropriate discourse markers or connectors.**	**topics and mostly accurate when the speaker is confronted with a linguistic or situational complication or an unexpected turn of events.** **Is able to comprehend a range of speech varieties (dialect and/or accent) or registers.**	**speaker/listener relationship effectively.**
Operational **(Level 4)**	**Pronunciation, stress, rhythm, and intonation are influenced by the first language or regional variation but only sometimes**	**Basic grammatical structures and sentence patterns are used creatively and are usually well controlled. Errors**	**Vocabulary range and accuracy are usually sufficient to communicate effectively on common, concrete, and work related**	**Produces stretches of language at an appropriate tempo.** **There may be occasional loss of fluency on**	**Comprehension is mostly accurate on common, concrete, and work related topics when the accent or variety used is**	**Responses are usually immediate, appropriate, and informative.** **Initiates and maintains exchanges even**

LEVEL	*PRONUNCIATION* *Assumes a dialect and/or accent intelligible to the aeronautical community*	*STRUCTURE* *Relevant grammatical structures and sentence patterns are determined by language functions appropriate to the task*	*VOCABULARY*	*FLUENCY*	*COMPREHENSION*	*INTERACTIONS*
	interfere with ease of understanding.	**may occur, particularly in unusual or unexpected circumstances, but rarely interfere with meaning.**	**topics.** **Can often paraphrase successfully when lacking vocabulary particularly in unusual or unexpected circumstances.**	**transition from rehearsed or formulaic speech to spontaneous interaction, but this does not prevent effective communication. Can make limited use of discourse markers and connectors. Fillers are not distracting.**	**sufficiently intelligible for an international community of users.** **When the speaker is confronted with a linguistic or situational complication or an unexpected turn of events, comprehension may be slower or require clarification strategies.**	**when dealing with an unexpected turn of events. Deals adequately with apparent misunderstandings by checking, confirming, or clarifying.**
Pre-operational (Level 3)	**Pronunciation, stress, rhythm, and intonation are influenced by the first language**	**Basic grammatical structures and sentence patterns**	**Vocabulary range and accuracy are often sufficient to communicate effectively on**	**Produces stretches of language, but phrasing and pausing are often**	**Comprehension is often accurate on common, concrete, and work related**	**Responses are sometimes immediate, appropriate, and informative.**

LEVEL	*PRONUNCIATION* *Assumes a dialect and/or accent intelligible to the aeronautical community*	*STRUCTURE* *Relevant grammatical structures and sentence patterns are determined by language functions appropriate to the task*	*VOCABULARY*	*FLUENCY*	*COMPREHENSION*	*INTERACTIONS*
	or regional variation and frequently interfere with ease of understanding.	**associated with predictable situations are not always well controlled. Errors frequently interfere with meaning.**	**common, concrete, and work related topics but range is limited and the word choice often inappropriate. Is often unable to paraphrase successfully when lacking vocabulary.**	**inappropriate. Hesitations or slowness in language processing may prevent effective communication. Fillers are sometimes distracting.**	**topics when the accent or variety used is sufficiently intelligible for an international community of users.** **May fall to understand a linguistic or situational complication or an unexpected turn of events.**	**Can initiate and maintain exchanges with reasonable ease on familiar topics and in predictable situations. Generally inadequate when dealing with an unexpected turn of events.**
Elementary (Level 2)	**Pronunciation, stress, rhythm, and intonation are heavily influenced by the first language or regional variation and usually**	**Shows only limited control of few simple memorized grammatical structures and sentence patterns.**	**Limited vocabulary range consisting only of isolated words and memorized phrases.**	**Can produce very short, isolated, memorized utterances with frequent pausing and a distracting use of filers to search for**	**Comprehension is limited to isolated, memorized phrases when they are carefully and slowly articulated.**	**Response time is slow, and often inappropriate. Interaction is limited to simple routine exchanges.**

LEVEL	*PRONUNCIATION* *Assumes a dialect and/or accent intelligible to the aeronautical community*	*STRUCTURE* *Relevant grammatical structures and sentence patterns are determined by language functions appropriate to the task*	*VOCABULARY*	*FLUENCY*	*COMPREHENSION*	*INTERACTIONS*
	interfere with ease of understanding.			**expressions and articulate less familiar words.**		
Pre-elementary (Level 1)	**Performs at a level below the Elementary level.**	**Performs at a level below the Elementary level.**	**Performs at a level below the Elementary level.**	**Performs at a level below the Elementary level.**	**Performs at a level below the Elementary level.**	**Performs at a level below the Elementary level.**

NOTE: The Operational Level (Level 4) is the minimum required proficiency level for radiotelephony communication.

Levels 1 through 3 describe Pre-elementary, Elementary and Pre-operational levels of language proficiency respectively, all of which describe a level below the language proficiency requirement.

Levels 5 and 6 describe Extended and Expert levels at levels of proficiency more advanced than the minimum required standard.

AMC No 3~~2~~ to FCL.055

Language proficiency – Specific requirements for holders of an IR

USE OF ENGLISH LANGUAGE

1. The requirement of FCL.055(d) includes the ability to use the English language for the following purposes:

   (a) flight:

   Radio telephony relevant to all phases of flight, including emergency situations.

   (b) ground:

   All information relevant to the accomplishment of a flight, e.g.**,**

   - be able to read and demonstrate an understanding of technical manuals written in English, e.g. an Operations Manual, a Helicopter Flight Manual, etc.
   - pre-flight planning, weather information collection, NOTAMs, ATC Flight Plan, etc.
   - use of all aeronautical en-route, departure and approach charts and associated documents written in English.

   (c) communication:

   Be able to communicate with other crew members in English during all phases of flight, including flight preparation.

2. Alternatively, the items in 1. above may be demonstrated:

   2.1 By having passed a specific examination given by the Authority after having undertaken a course of training enabling the applicant to meet all the objectives listed in 1(a), (b) and (c) above; or

   2.2. The item in 1.(a) above is considered to be fulfilled, if the applicant has passed an IR, MPL or ATPL skill test or proficiency check during which the two-way radiotelephony communication is performed in English.

   2.3 The item in 1.(b) above is considered to be fulfilled if the applicant has graduated from a IR, MPL or ATP course given in English or if he/she has passed the theoretical IR or ATPL examination in English;

   2.4 The item in (c) above is considered to be fulfilled, if the applicant for or the holder of an IR has graduated from a MCC course given in English and is holding a certificate of satisfactory completion of that course in accordance or if he has passed a multi-pilot skill test/proficiency check for the issue of a class or type rating during which the two-way radiotelephony communication and the communication with other crew members are performed in English.

3. Where the examination methods referred **to** above ~~meet~~ are equivalent to those established for the language proficiency requirements in accordance with AMC No 1 to FCL.055, the examination may be used for the purpose of issuing a Language Proficiency endorsement.

AMC No 1 to FCL.060(b)(1)

Recent experience

When a pilot needs to carry out one or more flights with an instructor or an examiner in order to comply with the requirement of FCL.060(b)(1) before he/she can carry passengers, the instructor or examiner on board those flights will not be considered a passenger.

AMC No 1 to FCL.060(b)(4)

Recent experience – non-complex helicopters

Grouping of non-complex helicopters with similar handling and operational characteristics:

- Group 1: Bell 206/206L, Bell 407;
- Group 2: Hughes 369, MD 500N, MD 520N, MD 600;
- Group 3: SA 341/342, EC 120, EC 130;
- Group 4: SA 313/318, SA 315/316/319, AS 350;
- Group 5: all types listed in ~~Appendix 11 to Part-FCL~~**the AMC to FCL.740.H (a)(3)**~~, R22, R44~~.

GM No 1 to FCL.060(b)(1)

Recent experience – Aeroplanes, helicopters, powered-lift, airships and sailplanes.

If a pilot or a pilot in command is operating under the supervision of a qualified instructor in order to comply with the required three take-offs, approaches and landings, no further passengers may be on board.

SUBPART B

LIGHT AIRCRAFT~~EISURE~~ PILOT LICENCE —— LAPL

AMC No 1 to FCL.115 and FCL.120

SYLLABUS OF THEORETICAL KNOWLEDGE FOR THE LIGHT ~~EISURE~~ AIRCRAFT PILOT LICENCE

The following tables contain the syllabi for the courses of theoretical knowledge, as well as for the theoretical knowledge examinations for the L**A**PL**(B) and LAPL(S)**. **The syllabi for the theoretical knowledge instruction and examination for the PPL(A) and PPL(H) in AMC No 1 to FCL.210 and FCL.215 should be used for the Basic LAPL(A). the LPL(A) and the LPL(H), respectively.**

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

I. COMMON SUBJECTS

[FOR ~~BASIC LPL, LPL(A), LPL(H),~~ L**A**PL(S) AND L**A**PL(B)**]**

1.	**AIR LAW AND ATC PROCEDURES**
1.1.	INTERNATIONAL LAW: CONVENTIONS, AGREEMENTS AND ORGANISATIONS
1.2.	AIRWORTHINESS OF AIRCRAFT
1.3.	AIRCRAFT NATIONALITY AND REGISTRATION MARKS
1.4.	PERSONNEL LICENSING
1.5.	RULES OF THE AIR
1.6.	PROCEDURES FOR AIR NAVIGATION — AIRCRAFT OPERATIONS
1.7.	AIR TRAFFIC REGULATIONS — AIRSPACE STRUCTURE
1.8.	AIR TRAFFIC SERVICES AND AIR TRAFFIC MANAGEMENT
1.9.	AIR TRAFFIC REGULATIONS — AIRSPACE STRUCTURE
1.10.	AERONAUTICAL INFORMATION SERVICE
1.11.	AERODROMES, EXTERNAL TAKE—OFF SITES
1.12.	SEARCH AND RESCUE

1.13.	SECURITY
1.14.	ACCIDENT REPORTING
1.15.	NATIONAL LAW
2.	**HUMAN PERFORMANCE**
2.1.	HUMAN FACTORS: BASIC CONCEPTS
2.2.	BASIC AVIATION PHYSIOLOGY AND HEALTH MAINTENANCE
2.3.	BASIC AVIATION PSYCHOLOGY
3.	**METEOROLOGY**
3.1.	THE ATMOSPHERE
3.2.	WIND
3.3.	THERMODYNAMICS
3.4.	CLOUDS AND FOG
3.5.	PRECIPITATION
3.6.	AIR MASSES AND FRONTS
3.7.	PRESSURE SYSTEMS
3.8.	CLIMATOLOGY
3.9.	FLIGHT HAZARDS
3.10.	METEOROLOGICAL INFORMATION
4.	**COMMUNICATIONS**
4.1.	VFR COMMUNICATIONS
4.2.	DEFINITIONS
4.3.	GENERAL OPERATING PROCEDURES
4.4.	RELEVANT WEATHER INFORMATION TERMS (VFR)
4.5.	ACTION REQUIRED TO BE TAKEN IN CASE OF COMMUNICATION FAILURE
4.6.	DISTRESS AND URGENCY PROCEDURES
4.7.	GENERAL PRINCIPLES OF VHF PROPAGATION AND ALLOCATION OF FREQUENCIES

II. ADDITIONAL SUBJECTS FOR EACH CATEGORY

~~II.A. AEROPLANES~~

~~5.~~	**~~PRINCIPLES OF FLIGHT~~**
~~5.1.~~	~~SUBSONIC AERODYNAMICS~~
~~5.2.~~	~~STABILITY~~
~~5.3.~~	~~CONTROL~~
~~5.4.~~	~~LIMITATIONS~~
~~5.5.~~	~~PROPELLERS~~
~~5.6.~~	~~FLIGHT MECHANICS~~

~~6.~~	**~~OPERATIONAL PROCEDURES —- AEROPLANE~~**
~~6.1.~~	~~GENERAL REQUIREMENTS~~
~~6.2.~~	~~SPECIAL OPERATIONAL PROCEDURES AND HAZARDS (GENERAL ASPECTS)~~
~~6.3.~~	~~EMERGENCY PROCEDURES~~
~~7.~~	**~~FLIGHT PERFORMANCE AND PLANNING —- AEROPLANES~~**
~~7.1.~~	~~MASS AND BALANCE —- AEROPLANES~~
~~7.1.2.~~	~~PURPOSE OF MASS AND BALANCE CONSIDERATIONS~~
~~7.1.3.~~	~~LOADING~~
~~7.1.4.~~	~~FUNDAMENTALS OF CG CALCULATIONS~~
~~7.1.5.~~	~~MASS AND BALANCE DETAILS OF AIRCRAFT~~
~~7.1.6.~~	~~DETERMINATION OF CG POSITION~~
~~7.2.~~	~~PERFORMANCE —- AEROPLANES~~
~~7.2.1.~~	~~GENERAL~~
~~7.2.2.~~	~~SINGLE-ENGINE AEROPLANES~~
~~7.3.~~	~~FLIGHT PLANNING AND FLIGHT MONITORING~~
~~7.3.1.~~	~~FLIGHT PLANNING FOR VFR FLIGHTS~~
~~7.3.2.~~	~~FUEL PLANNING~~
~~7.3.3.~~	~~PRE-FLIGHT PREPARATION~~
~~7.3.4.~~	~~ICAO FLIGHT PLAN (ATS Flight Plan)~~
~~7.3.5.~~	~~FLIGHT MONITORING AND IN-FLIGHT RE-PLANNING~~
~~8.~~	**~~AIRCRAFT GENERAL KNOWLEDGE —- AIRFRAME AND SYSTEMS, ELECTRICS, POWERPLANT, EMERGENCY EQUIPMENT~~**
~~8.1.1.~~	~~SYSTEM DESIGN, LOADS, STRESSES, MAINTENANCE~~
~~8.1.2.~~	~~AIRFRAME~~
~~8.1.3.~~	~~HYDRAULICS~~
~~8.1.4.~~	~~LANDING GEAR, WHEELS, TYRES, BRAKES~~
~~8.1.5.~~	~~FLIGHT CONTROLS~~
~~8.1.6.~~	~~ANTI-ICING SYSTEMS~~
~~8.1.7.~~	~~FUEL SYSTEM~~
~~8.1.8.~~	~~ELECTRICS~~
~~8.1.9.~~	~~PISTON ENGINES~~
~~8.2.~~	~~AIRCRAFT INSTRUMENTATION~~
~~8.2.1~~	~~SENSORS AND INSTRUMENTS~~
~~8.2.2.~~	~~MEASUREMENT OF AIR DATA PARAMETERS~~

~~8.2.3.~~	~~MAGNETISM —- DIRECT READING COMPASS~~
~~8.2.4.~~	~~GYROSCOPIC INSTRUMENTS~~
~~8.2.5.~~	~~COMMUNICATION SYSTEMS~~
~~8.2.6.~~	~~ALERTING SYSTEMS, PROXIMITY SYSTEMS~~
~~8.2.7.~~	~~INTEGRATED INSTRUMENTS —- ELECTRONIC DISPLAYS~~
~~9.~~	**~~NAVIGATION —- AEROPLANE~~**
~~9.1.~~	~~GENERAL NAVIGATION~~
~~9.2.~~	~~BASICS OF NAVIGATION~~
~~9.3.~~	~~MAGNETISM AND COMPASSES~~
~~9.4.~~	~~CHARTS~~
~~9.5.~~	~~DEAD RECKONING NAVIGATION (DR)~~
~~9.6.~~	~~IN-FLIGHT NAVIGATION~~
~~9.7.~~	~~RADIO NAVIGATION (BASICS)~~
~~9.7.1.~~	~~BASIC RADIO PROPAGATION THEORY~~
~~9.7.2.~~	~~RADIO AIDS~~
~~9.7.3.~~	~~RADAR~~
~~9.7.4.~~	~~GLOBAL NAVIGATION SATELLITE SYSTEMS~~

~~II.B. HELICOPTERS~~

~~5.~~	**~~PRINCIPLES OF FLIGHT —- HELICOPTERS~~**
~~5.1.~~	~~SUBSONIC AERODYNAMICS~~
~~5.2.~~	~~TRANSONIC AERODYNAMICS and **AND** COMPRESSIBILITY EFFECTS~~
~~5.3.~~	~~ROTORCRAFT TYPES~~
~~5.4.~~	~~MAIN ROTOR AERODYNAMICS~~
~~5.5.~~	~~MAIN ROTOR MECHANICS~~
~~5.6.~~	~~TAIL ROTORS~~
~~5.7.~~	~~EQUILIBRIUM, STABILITY AND CONTROL~~
~~5.8.~~	~~HELICOPTER PERFORMANCES~~

~~6.~~	**~~OPERATIONAL PROCEDURES —- HELICOPTER~~**
~~6.1.~~	~~GENERAL REQUIREMENTS~~
~~6.2.~~	~~SPECIAL OPERATIONAL PROCEDURES AND HAZARDS (GENERAL ASPECTS)~~
~~6.3.~~	~~EMERGENCY PROCEDURES~~
~~7.~~	**~~FLIGHT PERFORMANCE AND PLANNING —- HELICOPTER~~**

~~7.1.~~	~~MASS AND BALANCE —- HELICOPTERS~~
~~7.1.1.~~	~~PURPOSE OF MASS AND BALANCE CONSIDERATIONS~~
~~7.1.2.~~	~~LOADING~~
~~7.1.3.~~	~~FUNDAMENTALS OF CG CALCULATIONS~~
~~7.1.4.~~	~~MASS AND BALANCE DETAILS OF AIRCRAFT~~
~~7.1.5.~~	~~DETERMINATION OF CG POSITION~~
~~7.2.~~	~~PERFORMANCE —- HELICOPTERS~~
~~7.2.1.~~	~~GENERAL~~
~~7.2.2.~~	~~SINGLE-ENGINE HELICOPTERS~~
~~7.3.~~	~~FLIGHT PLANNING AND FLIGHT MONITORING~~
~~7.3.1.~~	~~FLIGHT PLANNING FOR VFR FLIGHTS~~
~~7.3.2.~~	~~FUEL PLANNING~~
~~7.3.3.~~	~~PRE-FLIGHT PREPARATION~~
~~7.3.4.~~	~~ICAO FLIGHT PLAN (ATS Flight Plan)~~
~~7.3.5.~~	~~FLIGHT MONITORING AND IN-FLIGHT RE-PLANNING~~
~~8.~~	**~~AIRCRAFT GENERAL KNOWLEDGE —- AIRFRAME AND SYSTEMS, ELECTRICS, POWERPLANT, EMERGENCY EQUIPMENT~~**
~~8.1.1.~~	~~SYSTEM DESIGN, LOADS, STRESSES, MAINTENANCE~~
~~8.1.2.~~	~~AIRFRAME~~
~~8.1.3.~~	~~HYDRAULICS~~
~~8.1.4.~~	~~LANDING GEAR, WHEELS, TYRES, BRAKES~~
~~8.1.5.~~	~~FLIGHT CONTROLS~~
~~8.1.6.~~	~~ANTI-ICING SYSTEMS~~
~~8.1.7.~~	~~FUEL SYSTEM~~
~~8.1.8.~~	~~ELECTRICS~~
~~8.1.9.~~	~~PISTON ENGINES~~
~~8.1.10.~~	~~TURBINE ENGINES~~
~~8.1.11.~~	~~PROTECTION AND DETECTION SYSTEMS~~
~~8.1.12.~~	~~MISCELLANEOUS SYSTEMS~~
~~8.1.13.~~	~~ROTOR HEADS~~
~~8.1.14.~~	~~TRANSMISSION~~
~~8.1.15.~~	~~BLADES~~
~~8.2.~~	~~AIRCRAFT INSTRUMENTATION~~
~~8.2.1~~	~~INSTRUMENT AND INDICATION SYSTEMS~~
~~8.2.2.~~	~~MEASUREMENT OF AERODYNAMIC PARAMETERS~~

~~8.2.3.~~	~~MAGNETISM -— DIRECT READING COMPASS~~
~~8.2.4.~~	~~GYROSCOPIC INSTRUMENTS~~
~~8.2.5.~~	~~COMMUNICATION SYSTEMS~~
~~8.2.6.~~	~~ALERTING SYSTEMS, PROXIMITY SYSTEMS~~
~~8.2.7.~~	~~INTEGRATED INSTRUMENTS -— ELECTRONIC DISPLAYS~~
~~9.~~	**~~NAVIGATION -— HELICOPTER~~**
~~9.1.~~	~~GENERAL NAVIGATION~~
~~9.2.~~	~~BASICS OF NAVIGATION~~
~~9.3.~~	~~MAGNETISM AND COMPASSES~~
~~9.4.~~	~~CHARTS~~
~~9.5.~~	~~DEAD RECKONING NAVIGATION (DR)~~
~~9.6.~~	~~INFLIGHT NAVIGATION~~
~~9.7.~~	~~RADIO NAVIGATION (BASICS)~~
~~9.7.1.~~	~~BASIC RADIO PROPAGATION THEORY~~
~~9.7.2.~~	~~RADIO AIDS~~
~~9.7.3.~~	~~RADAR~~
~~9.7.4.~~	~~GLOBAL NAVIGATION SATELLITE SYSTEMS~~

II.A~~C~~. SAILPLANES

5.	**PRINCIPLES OF FLIGHT -— SAILPLANE**
5.1.	AERODYNAMICS (AIRFLOW)
5.2.	FLIGHT MECHANICS
5.3.	STABILITY
5.4.	CONTROL
5.5.	LIMITATIONS (LOAD FACTOR AND MANOEUVRES)
5.6.	STALLING AND SPINNING
6.	**OPERATIONAL PROCEDURES — SAILPLANE**
6.1.	GENERAL REQUIREMENTS
6.2.	LAUNCH METHODS
6.3.	SOARING TECHNIQUES
6.4.	CIRCUITS AND LANDING
6.5.	OUTLANDING
6.6.	SPECIAL OPERATIONAL PROCEDURES AND HAZARDS
6.7.	EMERGENCY PROCEDURES

7.	**FLIGHT PERFORMANCE AND PLANNING –— SAILPLANE**
7.1.	VERIFYING MASS AND BALANCE
7.2.	SPEED POLAR OF SAILPLANES / CRUISING SPEED
7.3.	FLIGHT PLANNING AND TASK SETTING
7.4.	ICAO FLIGHT PLAN (ATS Flight Plan)
7.5.	FLIGHT MONITORING AND IN-FLIGHT RE-PLANNING
8.	**AIRCRAFT GENERAL KNOWLEDGE — AIRFRAME AND SYSTEMS, EMERGENCY EQUIPMENT**
8.1.	AIRFRAME
8.2.	SYSTEM DESIGN, LOADS, STRESSES
8.3.	LANDING GEAR, WHEELS, TYRES, BRAKES
8.4.	MASS AND BALANCE
8.5.	FLIGHT CONTROLS
8.6.	INSTRUMENTS
8.7.	MANUALS AND DOCU MENTS
8.8.	AIRWOTHINESS, MAINTENANCE
9.	**NAVIGATION — SAILPLANE**
9.1.	BASICS OF NAVIGATION
9.2.	MAGNETISM AND COMPASSES
9.3.	CHARTS
9.4.	DEAD RECKONING NAVIGATION (DR)
9.5.	IN-FLIGHT NAVIGATION
9.6.	GLOBAL NAVIGATION SATELLITE SYSTEMS

II.B~~D~~. BALLOONS

5.	**PRINCIPLES OF FLIGHT — BALLOON**
5.1.	PRINCIPLES OF FLIGHT — BALLOONS
5.2.	AEROSTATICS
5.3.	LOADING LIMITATIONS
5.4.	OPERATIONAL LIMITATIONS
6.	**OPERATIONAL PROCEDURES — BALLOON**
6.1.	GENERAL REQUIREMENTS
6.2.	SPECIAL OPERATIONAL PROCEDURES AND HAZARDS (GENERAL ASPECTS)
6.3.	EMERGENCY PROCEDURES

7.	**FLIGHT PERFORMANCE AND PLANNING -— BALLOON**
7.1.	MASS — BALLOONS
7.1.1.	PURPOSE OF MASS CONSIDERATIONS
7.1.2.	LOADING
7.2.	PERFORMANCE — BALLOONS
7.2.1.	GENERAL
7.3.	FLIGHT PLANNING AND FLIGHT MONITORING
7.3.1.	FLIGHT PLANNING — GENERAL
7.3.2.	FUEL PLANNING
7.3.3.	PRE-FLIGHT PREPARATION
7.3.4.	ICAO FLIGHT PLAN (ATS Flight Plan)
7.3.5.	FLIGHT MONITORING AND IN-FLIGHT RE-PLANNING
8.	**AIRCRAFT GENERAL KNOWLEDGE — ENVELOPE AND SYSTEMS, EMERGENCY EQUIPMENT**
8.1.	SYSTEM DESIGN, LOADS, STRESSES, MAINTENANCE
8.2.	ENVELOPE
8.3.	BURNER (HOT AIR BALLOON, HOT AIR AIRSHIP)
8.4.	FUEL CYLINDERS (HOT AIR BALLOON / - AIRSHIP)
8.5.	BASKET / GONDOLA
8.6.	LIFTING GAS (GAS BALLOON)
8.7.	BURNING GAS (HOT AIR BALLOON, - AIRSHIP)
8.8.	BALLAST (GAS BALLOON)
8.9.	ENGINE (HOT AIR AIRSHIP ONLY)
8.10.	INSTRUMENTS
8.11.	EMERGENCY EQUIPMENT
9.	**NAVIGATION — BALLOON**
9.1.	GENERAL NAVIGATION
9.2.	BASICS OF NAVIGATION
9.3.	MAGNETISM AND COMPASSES
9.4.	CHARTS
9.5.	DEAD RECKONING NAVIGATION (DR)
9.6.	IN-FLIGHT NAVIGATION
9.7.	GLOBAL NAVIGATION SATELLITE SYSTEMS

AMC No 1 to FCL.120 and FCL.125

Theoretical knowledge examination and skill test for the LAPL

1. THEORETICAL KNOWLEDGE EXAMINATION

   1.1 The examinations should be in written form and should comprise a total of 120 multiple choice questions covering all the subjects.

   1.2 Communication practical classroom testing may be conducted.

   1.3 The competent authority should inform applicants of the language(s) in which the examinations will be conducted.

   1.4 The period of 18 months mentioned in FCL.025(b) should be counted from the end of the calendar month when the applicant first attempted an examination.

2. SKILL TEST

   2.1 Further training may be required following any failed skill test or part thereof. There should be no limit to the number of skill tests that may be attempted.

3. CONDUCT OF THE TEST

   3.1 If the applicant chooses to terminate a skill test for reasons considered inadequate by the flight examiner, the applicant should retake the entire skill test. If the test is terminated for reasons considered adequate by the flight examiner, only those sections not completed should be tested in a further flight.

   3.2 Any manoeuvre or procedure of the test may be repeated once by the applicant. The flight examiner may stop the test at any stage if it is considered that the applicant's demonstration of flying skill requires a complete retest.

   3.3 An applicant should be required to fly the aircraft from a position where the pilot-in-command functions can be performed and to carry out the test as if there is no other crew member. Responsibility for the flight should be allocated in accordance with national regulations.

AMC No 1 to FCL.125

Contents of the skill test for the issue of a Basic LAPL(A) and an LAPL(A)

1. The route to be flown for the skill test should be chosen by the flight examiner (FE). The route should end at the aerodrome of departure ~~(Basic LPL(A))~~ or at another aerodrome (**only** L**A**PL(A)). The applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board. The navigation section of the test for the L**A**PL(A) should have a duration of at least 30 minutes which allows the pilot to demonstrate his/her ability to complete a route with at least two identified waypoints and may, as agreed between applicant and FE, be flown as a separate test.

2. An applicant should indicate to the FE the checks and duties carried out, including the identification of radio facilities. Checks should be completed in accordance with the flight manual and/or the authorised check list for the aeroplane or touring motor glider on which the test is being taken. During

pre-flight preparation for the test the applicant should be required to determine power settings and speeds. Performance data for take-off, approach and landing should be calculated by the applicant in compliance with the operations manual or flight manual for the aeroplane / touring motor glider used.

FLIGHT TEST TOLERANCE

3. The applicant should demonstrate the ability to:

- operate the aeroplane / touring motor glider within its limitations;
- complete all manoeuvres with smoothness and accuracy;
- exercise good judgment and airmanship;
- apply aeronautical knowledge; and
- maintain control of the aeroplane / touring motor glider at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

4. The following limits are for general guidance. The FE should make allowance for turbulent conditions and the handling qualities and performance of the aeroplane / touring motor glider used.

Height

normal flight	± 150 feet
~~with simulated engine failure~~	~~± 200 feet~~

Speed

take-off and approach	+15/5 knots
all other flight regimes	± 15 knots

5. Contents of the skill test for the issue of a Basic L**A**PL(A)

SECTION 1 PRE-FLIGHT OPERATIONS AND DEPARTURE	
Use of checklist, airmanship**,** ~~(~~control of aeroplane by external visual reference, anti/de-icing procedures, etc.~~)~~ apply in all sections.	
a	Pre-flight documentation**, NOTAM** and weather brief
b	Mass and balance and performance calculation
c	Aeroplane / touring motor glider inspection and servicing
d	Engine starting and after starting procedures
e	Taxiing and aerodrome procedures, pre**-**take-off procedures
f	Take-off and after take-off checks
g	Aerodrome departure procedure**s**
h	ATC liaison — compliance

SECTION 2 GENERAL AIRWORK	
a	ATC liaison — compliance
b	Straight and level flight, with speed changes
c	Climbing: i. Best rate of climb ii. Climbing turns iii. Levelling off
d	Medium (30° bank) turns, look out procedures and collision avoidance
e	Flight at critically low airspeed with and without flaps
f	Stalling: i. Clean stall and recover with power ii. Approach to stall descending turn with bank angle 20°, approach configuration iii. Approach to stall in landing configuration
g	Descending: i. With and without power ii. Descending turns (steep gliding turns) iii. Levelling off
SECTION 3 EN-ROUTE PROCEDURES	
a	Dead reckoning and map reading
b	Maintenance of altitude, heading and speed
c	Orientation **and** ~~,~~airspace structure~~,~~
de	Flight management (checks, fuel systems and carburettor icing, etc.)~~ — ATC liaison – compliance~~
e~~f~~	**ATC liaison — compliance**
SECTION 4 APPROACH AND LANDING PROCEDURES	
a	Aerodrome arrival procedure**s**
b	Collision avoidance (look out procedures)
c	~~*~~Precision landing (short field landing), cross wind, if suitable conditions available
d	~~*~~Flapless landing (if applicable)
e	~~*~~Approach to landing with idle power
f	Touch and go
g	Go-around from low height
h	ATC liaison — compliance
i	Actions after flight

SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES This section may be combined with Sections 1 through 4.	
This section may be combined with Sections 1 through 4	
a	Simulated engine failure after take-off
b	* Simulated forced landing
c	* Simulated precautionary landing
d	Simulated emergencies
e	Oral questions

* These items may be combined, at the discretion of the FE.

6. Contents of the skill test for the issue of a**n** L**A**PL(A)

SECTION 1 PRE-FLIGHT OPERATIONS AND DEPARTURE	
Use of checklist, airmanship**,** ~~(~~control of aeroplane by external visual reference, anti/de-icing procedures, etc.~~)~~ apply in all sections	
a	Pre-flight documentation**, NOTAM** and weather brief
b	Mass and balance and performance calculation
c	Aeroplane / touring motor glider inspection and servicing
d	Engine starting and after starting procedures
e	Taxiing and aerodrome procedures, pre**-**take-off procedures
f	Take-off and after take-off checks
g	Aerodrome departure procedures
h	ATC liaison **—** compliance

SECTION 2 GENERAL AIRWORK	
a	ATC liaison — compliance
b	Straight and level flight, with speed changes
c	Climbing: i. Best rate of climb ii. Climbing turns iii. Levelling off
d	Medium (30° bank) turns, look out procedures and collision avoidance
e	Steep (45° bank) turns
f	Flight at critically low airspeed with and without flaps
g	Stalling: i. Clean stall and recover with power ii. Approach to stall descending turn with bank angle 20°, approach configuration iii. Approach to stall in landing configuration
h	Descending: i. With and without power ii. Descending turns (steep gliding turns) iii. Levelling off
SECTION 3 EN-ROUTE PROCEDURES	
a	Flight plan, dead reckoning and map reading
b	Maintenance of altitude, heading and speed
c	Orientation, airspace structure, timing and revision of ETAs, log keeping
d	Diversion to alternate aerodrome (planning and implementation)
e	Flight management (checks, fuel systems and carburettor icing, etc.) ~~ATC liaison – compliance~~
f	**ATC liaison — compliance**

SECTION 4 APPROACH AND LANDING PROCEDURES	
a	Aerodrome arrival procedures
b	Collision avoidance (look out procedures)
c	~~*~~ Precision landing (short field landing), cross wind, if suitable conditions available
d	~~*~~ Flapless landing (if applicable)
e	~~*~~ Approach to landing with idle power
f	Touch and go
g	Go-around from low height
h	ATC liaison — compliance
i	Actions after flight
SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES	
This section may be combined with Sections 1 through 4	
a	Simulated engine failure after take-off
b	* Simulated forced landing
c	* Simulated precautionary landing
d	Simulated emergencies
e	Oral questions

* These items may be combined, at the discretion of the FE.

AMC No 2 to FCL.125

Contents of the skill test for the issue of a~~ Basic LPL(H) and a~~n LAPL(H)

1. The area and route to be flown for the skill test should be chosen by the flight examiner (FE). The route should end at the aerodrome of departure ~~(Basic LPL(H))~~ or at another aerodrome ~~(LPL(H))~~. The applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board. The navigation section of the test ~~for the LPL(H)~~ should consist of at least two legs, each leg of a minimum duration of 10 minutes. The skill test may be conducted in 2 flights.

2. An applicant should indicate to the FE the checks and duties carried out, including the identification of radio facilities. Checks should be completed in accordance with the flight manual and/or the authorised check list or pilot operating handbook for the helicopter on which the test is being taken. During pre-flight preparation for the test the applicant should be required to determine power settings and speeds. Performance data for take-off, approach and landing should be calculated by the applicant in compliance with the operations manual or flight manual for the helicopter used.

FLIGHT TEST TOLERANCE

3. The applicant should demonstrate the ability to:

- operate the helicopter within its limitations;
- complete all manoeuvres with smoothness and accuracy;
- exercise good judgment and airmanship;
- apply aeronautical knowledge; and
- maintain control of the helicopter at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

4. The following limits are for general guidance. The FE should make allowance for turbulent conditions and the handling qualities and performance of the helicopter used.

Height	
normal forward flight	± 150 feet
with simulated major emergency	± 200 feet
hovering I.G.E. flight	± 2 feet
Speed	
take-off approach	**+15 knots** ~~– 10 knots~~/**10 knots** ~~+15 knots~~
all other flight regimes	± 15 knots
Ground drift	
T.O. hover I.G.E.	± 3 feet
landing	no sideways or backwards movement

~~5 Contents of the skill test for the issue of a Basic LPL(H)~~

~~**SECTION 1 PRE-FLIGHT/POST-FLIGHT CHECKS AND PROCEDURES**~~	
~~Use of checklist, airmanship, control of helicopter by external visual reference, anti-icing procedures, etc., apply in all sections~~	
~~a~~	~~Helicopter knowledge, (e.g. technical log, fuel, mass and balance, performance), Flight Planning, NOTAMS, Weather~~
~~b~~	~~Pre-flight inspection/action, location of parts and purpose~~
~~c~~	~~Cockpit inspection, Starting procedure~~
~~d~~	~~Communication and navigation equipment checks, selecting and setting frequencies~~
~~e~~	~~Pre-take-off procedure, ATC liaison~~
~~f~~	~~Parking, Shutdown and Post-flight procedure~~

~~**SECTION 2 HOVER MANOEUVRES, ADVANCED HANDLING AND CONFINED AREAS**~~	
~~a~~	~~Take-off and landing (lift off and touch down)~~
~~b~~	~~Taxi, hover taxi~~
~~c~~	~~Stationary hover with head/cross/tail wind~~
~~d~~	~~Stationary hover turns, 360º left and right (spot turns)~~
~~e~~	~~Forward, sideways and backwards hover manoeuvring~~
~~f~~	~~Simulated engine failure from the hover~~
~~g~~	~~Quick stops into and downwind~~
~~h~~	~~Take-offs (various profiles)~~
~~i~~	~~Crosswind, downwind take-off (if practicable)~~
~~j~~	~~Take-off at maximum take-off mass (actual or simulated)~~
~~k~~	~~Approaches (various profiles)~~
~~l~~	~~Limited power take-off and landing~~
~~m~~	~~Autorotations, (FE to select two items from - Basic, range, low speed, and 360º turns)~~
~~n~~	~~Autorotative landing~~
~~o~~	~~Practice forced landing with power recovery~~
~~p~~	~~Power checks, reconnaissance technique, approach and departure technique~~
~~**SECTION 3 NAVIGATION – EN-ROUTE PROCEDURES**~~	
~~a~~	~~Navigation and orientation, map reading~~
~~b~~	~~Altitude/height, speed, heading control, observation of airspace, altimeter setting~~
~~c~~	~~Monitoring of flight progress, fuel usage, endurance, assessment of track error and reestablishment of correct track, instrument monitoring~~
~~d~~	~~Observation of weather conditions~~
~~e~~	~~Collision avoidance (look-out procedures)~~
~~f~~	~~ATC liaison~~
~~**SECTION 4 FLIGHT PROCEDURES AND MANOEUVRES**~~	
~~a~~	~~Level flight, control of heading, altitude/height and speed~~
~~b~~	~~Climbing and descending turns to specified headings~~
~~c~~	~~Level turns with up to 30º bank, 180º to 360º left and right~~

~~**SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES (SIMULATED WHERE APPROPRIATE)**~~	
~~Note: The FE selects 4 items from the following:~~	
~~a~~	~~Engine malfunctions, including governor failure, carburettor/engine icing, oil system, as appropriate~~
~~b~~	~~Fuel system malfunction~~
~~c~~	~~Electrical system malfunction~~
~~d~~	~~Hydraulic system malfunction, including approach and landing without hydraulics, as applicable~~
e	~~Main rotor and/or anti-torque system malfunction (flight simulator or discussion only)~~
~~f~~	~~Fire drills, including smoke control and removal, as applicable~~
~~g~~	~~Other abnormal and **e**Emergency procedures as outlined in appropriate flight manual~~

5.~~6~~ Contents of the skill test for the issue of a**n** L**A**PL(H)

SECTION 1 PRE-FLIGHT/POST-FLIGHT CHECKS AND PROCEDURES	
Use of checklist, airmanship, control of helicopter by external visual reference, anti-icing procedures, etc., apply in all sections	
a	Helicopter knowledge, (e.g. technical log, fuel, mass and balance, performance), Flight Planning, NOTAMS, Weather
b	Pre-flight inspection/action, location of parts and purpose
c	Cockpit inspection, Starting procedure
d	Communication and navigation equipment checks, selecting and setting frequencies
e	Pre-take-off procedure, ATC liaison
f	Parking, Shutdown and Post-flight procedure
SECTION 2 HOVER MANOEUVRES, ADVANCED HANDLING AND CONFINED AREAS	
a	Take-off and landing (lift off and touch down)
b	Taxi, hover taxi
c	Stationary hover with head/cross/tail wind
d	Stationary hover turns, 360º left and right (spot turns)
e	Forward, sideways and backwards hover manoeuvring
f	Simulated engine failure from the hover
g	Quick stops into and downwind

h	Sloping ground/unprepared sites landings and take-offs
i	Take-offs (various profiles)
j	Crosswind, downwind take-off (if practicable)
k	Take-off at maximum take-off mass (actual or simulated)
l	Approaches (various profiles)
m	Limited power take-off and landing
n	Autorotations, (FE to select two items from —– Basic, range, low speed, and 360°º turns)
o	Autorotative landing
p	Practice forced landing with power recovery
q	Power checks, reconnaissance technique, approach and departure technique
SECTION 3 NAVIGATION —— EN-ROUTE PROCEDURES	
a	Navigation and orientation at various altitudes / heights, map reading
b	Altitude/height, speed, heading control, observation of airspace, altimeter setting
c	Monitoring of flight progress, flight-log, fuel usage, endurance, ETA, assessment of track error and re-establishment of correct track, instrument monitoring
d	Observation of weather conditions, diversion planning
e	Collision avoidance (look-out procedures)
f	ATC liaison and observance of regulations, etc.
SECTION 4 FLIGHT PROCEDURES AND MANOEUVRES	
a	Level flight, control of heading, altitude/height and speed
b	Climbing and descending turns to specified headings
c	Level turns with up to 30º bank, 180º to 360º left and right
SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES (SIMULATED WHERE APPROPRIATE)	
Note: The FE selects 4 items from the following:	
a	Engine malfunctions, including governor failure, carburettor/engine icing, oil system, as appropriate
b	Fuel system malfunction
c	Electrical system malfunction
d	Hydraulic system malfunction, including approach and landing without hydraulics, as applicable
e	Main rotor and/or anti-torque system malfunction (flight simulator or discussion

	only)
f	Fire drills, including smoke control and removal, as applicable
g	Other abnormal and **e**~~E~~mergency procedures as outlined in appropriate flight manual

AMC No 1 to FCL.125 and to FCL.235

Contents of the skill test for the issue of an LAPL(S) and of an SPL

1. The applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board.
2. An applicant should indicate to the FE the checks and duties carried out. Checks should be completed in accordance with the flight manual and/or the authorised check list for the sailplane on which the test is being taken.

FLIGHT TEST TOLERANCE

3. The applicant should demonstrate the ability to:
   - operate the sailplane within its limitations;
   - complete all manoeuvres with smoothness and accuracy;
   - exercise good judgment and airmanship;
   - apply aeronautical knowledge; and
   - maintain control of the sailplane at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

4. Contents of the skill test for the issue of an LAPL(S) and of an SPL

SECTION 1 — PRE-FLIGHT OPERATIONS AND DEPARTURE	
Use of checklist, airmanship (control of sailplane by external visual reference), look out, apply in all sections	
a	Pre-flight sailplane (daily) inspection, documentation**, NOTAM and** ~~and~~ weather brief**ing**
b	Verifying in-limits mass and balance and performance calculation
c	Sailplane servicing compliance
d	Pre**-**take-off checks
SECTION 2 LAUNCH METHOD Note: At least for one of the three launch methods all the mentioned items are fully exercised during the skill test	
SECTION 2 (A) WINCH OR CAR LAUNCH	
a	Signals before and during launch, including messages to winch driver
b	Adequate profile of winch launch

c	**Simulated l**aunch failure~~s~~ ~~(simulated)~~
d	Situational awareness
SECTION 2 (B) AEROTOW LAUNCH	
a	Signals before and during launch, including signals to / communications with tow plane pilot for any problems
b	Initial roll, take-off climb
c	Launch abandonment (simulation only or ‘talk-through’)
d	Correct positioning during straight flight and turns
e	Out of position and recovery
f	Correct release from tow
g	Lookout and airmanship through whole launch phase
SECTION 2 (C) SELF-LAUNCH (powered sailplanes only)	
a	ATC liaison **—** compliance **(if applicable)**
b	Aerodrome departure procedures
c	Initial roll, take-off climb
d	Lookout and airmanship during the whole take-off
e	Simulated engine failure after take off
f	Engine shut down and stowage
SECTION 3 GENERAL AIRWORK	
a	Maintain straight ~~and level~~ flight; attitude and speed control
b	Co-ordinated medium (30**°** bank) turns, look out procedures and collision avoidance
c	Turning on to selected headings visually and with use of compass
d	Flight at high angle of attack (critically low airspeed)
e	Clean stall and recovery
f	Spin avoidance and recovery
g	Steep (45° bank) turns, look out procedures and collision avoidance
h	**Local area navigation and awareness**
SECTION 4 CIRCUIT, APPROACH AND LANDING	
a	Aerodrome circuit joining procedure
b	Collision avoidance **—** look out procedures

c	Pre landing checks
d	Circuit, approach control, landing
e	Precision landing (simulation of out-landing — short field)
f	Cross wind landing if suitable conditions available

AMC No 2 to FCL.125 and FCL.235

Contents of the skill test for the issue of an LAPL(B) and a BPL

1. The take-off site should be chosen by the applicant depending on the actual meteorological conditions, the area which has to be over flown and the possible options for suitable landing sites. The applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board.

2. An applicant should indicate to the FE the checks and duties carried out. Checks should be completed in accordance with the flight manual and/or the authorised check list for the balloon on which the test is being taken. During pre-flight preparation for the test the applicant should be required to perform crew and passenger briefings and demonstrate crowd control. The load calculation should be performed by the applicant in compliance with the operations manual or flight manual for the balloon used.

FLIGHT TEST TOLERANCE

3. The applicant should demonstrate the ability to:
   - operate the balloon within its limitations;
   - complete all manoeuvres with smoothness and accuracy
   - exercise good judgment and airmanship;
   - apply aeronautical knowledge; and
   - maintain control of the balloon at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

4. **Contents of the skill test for the issue of an LAPL(B) and a BPL (HOT AIR BALLOON)**

SECTION 1 — PRE-FLIGHT OPERATIONS, INFLATION AND TAKE--OFF	
Use of checklist, airmanship, control of balloon by external visual reference, look out procedures, etc. apply in all sections.	
a	Pre-flight documentation, flight planning**, NOTAM** and weather brief
b	Balloon inspection and servicing
c	Load calculation
d	Crowd control, crew and passenger briefings
e	Assembly and layout

f	Inflation and pre-take-off procedures
g	Take-off
h	ATC liaison — compliance (if applicable)
SECTION 2 GENERAL AIRWORK	
a	Climb to level flight
b	Level flight
c	Descent to level flight
d	Operating at low level
e	ATC liaison — compliance (if applicable)
SECTION 3 EN-ROUTE PROCEDURES	
a	Dead reckoning and map reading
b	Marking positions and time
c	Orientation, airspace structure
d	Maintenance of altitude
e	Fuel management
f	Communication with retrieve crew
g	ATC liaison — compliance ~~(if applicable)~~
SECTION 4 — APPROACH AND LANDING PROCEDURES	
a	Approach from low level, missed approach / fly on
b	Approach from high level, missed approach / fly on
c	Pre landing checks
d	**Passenger pre-landing briefing**
e~~d~~	Selection of landing field
f~~e~~	Landing, dragging and deflation
g~~f~~	ATC liaison — compliance (if applicable)
h~~g~~	Actions after flight
SECTION 5 — ABNORMAL AND EMERGENCY PROCEDURES	
This section may be combined with Sections 1 through 4	
a	Simulated **f**~~F~~ire on the ground and in the air
b	Simulated pilot light~~–~~ and burner failures
c	Other abnormal and emergency procedures as outlined in the appropriate flight

	manual.
d	Oral questions

5. The skill test contents and sections set out in the following part of the AMC should be used for the skill test for the issue of a**n** L**A**PL(B) and BPL (GAS BALLOON).

SECTION 1 — PRE-FLIGHT OPERATIONS, INFLATION AND TAKE-OFF	
Use of checklist, airmanship, control of balloon by external visual reference, look out procedures, etc. apply in all sections.	
a	Pre-flight documentation, flight planning**, NOTAM** and weather brief
b	Balloon inspection and servicing
c	Load calculation
d	Crowd control, crew and passenger briefings
e	Assembly and layout
f	Inflation and pre-take-off procedures
g	Take off
h	ATC liaison **—** compliance (if applicable)
SECTION 2 GENERAL AIRWORK	
a	Climb to level flight
b	Level flight
c	Descent to level flight
d	Operating at low level
e	ATC liaison **—** compliance (if applicable)
SECTION 3 — EN-ROUTE PROCEDURES	
a	Dead reckoning and map reading
b	Marking positions and time
c	Orientation, airspace structure
d	Maintenance of altitude
e	Ballast management
f	Communication with retrieve crew
g	ATC liaison **—** compliance ~~(if applicable)~~
SECTION 4 — APPROACH AND LANDING PROCEDURES	
a	Approach from low level, missed approach / fly on

b	Approach from high level, missed approach / fly on
c	Pre-landing checks
d	**Passenger pre-landing briefing**
e~~d~~	Selection of landing field
f~~e~~	Landing, dragging and deflation
g~~f~~	ATC liaison — compliance (if applicable)
h~~g~~	Actions after flight
SECTION 5 — ABNORMAL AND EMERGENCY PROCEDURES	
This section may be combined with Sections 1 through 4.	
a	Simulated closed appendix during take off and climb
b	Simulated parachute/valve failure
c	Other abnormal and emergency procedures as outlined in the appropriate flight manual.
d	Oral questions

AMC No 1 to FCL.110.BLAPL~~A/H~~
FLIGHT INSTRUCTION FOR THE BASIC LIGHT AIRCRAFT~~EISURE~~ PILOT LICENCE — BASIC LAPL~~ (A)~~

1. ENTRY TO TRAINING

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

2. FLIGHT INSTRUCTION

   2.1 The Basic L**A**PL(A) flight instruction syllabus should take into account the principles of threat and error management and also cover:

   (a) pre-flight operations, including mass and balance determination, aircraft inspection and servicing;

   (b) aerodrome and traffic pattern operations, collision avoidance precautions and procedures;

   (c) control of the aircraft by external visual reference;

   (d) flight at critically low airspeeds, recognition of, and recovery from, incipient and full stalls;

   ~~(e) flight at critically high airspeeds, recognition of, and recovery from, spiral dive;~~

   (**e**~~f~~) normal and crosswind take-offs and landings;

   (**f**~~g~~) maximum performance (short field and obstacle clearance) take-offs, short-field landings;

(**g**~~h~~) emergency operations, including simulated aeroplane equipment malfunctions; and

(**h**~~i~~) compliance with air traffic services procedures

2.2 Before allowing the applicant for a Basic L**A**PL(A) to undertake his/her first solo flight, the flight instructor should ensure that the applicant can operate the required systems and equipment.

3. SYLLABUS OF FLIGHT INSTRUCTION

3.1 The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore the demonstrations and practices need not necessarily be given **in**~~I~~ the order listed. The actual order and content will depend upon the following interrelated factors:

- The applicant's progress and ability
- The weather conditions affecting the flight
- The flight time available
- Instructional technique considerations
- The local operating environment
- Applicability of the exercises to the aeroplane / touring motor glider type

3.2 Each of the exercises involves the need for the pilot-under-training to be aware the needs of good airmanship and look-out, which should be emphasised at all times.

Exercise 1: Familiarisation with the aeroplane/touring motor glider

- characteristics of the aeroplane/touring motor glider
- cockpit layout
- systems
- check lists, drills, controls

Exercise 1E Emergency drills

- action in the event of fire on the ground and in the air
- engine cabin and electrical system fire
- systems failure
- escape drills, location and use of emergency equipment and exits

Exercise 2: Preparation for and action after flight

- flight authorisation and aeroplane/touring motor glider acceptance
- serviceability documents
- equipment required, maps, etc.
- external checks
- internal checks
- harness, seat or rudder panel adjustments

- starting and warm up checks
- power checks
- running down system checks and switching off the engine
- parking, security and picketing (e.g. tie down)
- completion of authorisation sheet and serviceability documents

Exercise 3: Air experience

- flight exercise

Exercise 4: Effects of controls

- primary effects when laterally level and when banked
- further effects of aileron and rudder
- effects of:
  - airspeed
  - slipstream
  - power
  - trimming controls
  - flaps
  - other controls, as applicable
- operation of:
  - mixture control
  - carburettor heat
  - cabin heating/ventilation

Exercise 5: Taxiing

- pre-taxi checks
- starting, control of speed and stopping
- engine handling
- control of direction and turning
- turning in confined spaces
- parking area procedure and precautions
- effects of wind and use of flying controls
- effects of ground surface
- freedom of rudder movement
- marshalling signals
- instrument checks
- air traffic control procedures

Exercise 5E: Emergencies

- Brake and steering failure

Exercise 6: Straight and level

- at normal cruising power, attaining and maintaining straight and level flight
- flight at critically high airspeeds
- demonstration of inherent stability
- control in pitch, including use of trim
- lateral level, direction and balance, trim
- at selected airspeeds (use of power)
- during speed and configuration changes
- use of instruments for precision

Exercise 7: Climbing

- entry, maintaining the normal and max rate climb, levelling off
- levelling off at selected altitudes
- en-route climb (cruise climb)
- climbing with flap down
- recovery to normal climb
- maximum angle of climb
- use of instruments for precision

Exercise 8: Descending

- entry, maintaining and levelling off
- levelling off at selected altitudes
- glide, powered and cruise descent (including effect of power and airspeed)
- side slipping (or suitable types)
- use of instruments for precision flight

Exercise 9: Turning

- entry and maintaining medium level turns
- resuming straight flight
- faults in the turn — (in correct pitch, bank, balance)
- climbing turns
- descending turns
- slipping turns (or suitable types)
- turns onto selected headings, use of gyro heading indicator and compass
- use of instruments for precision

Exercise 10A: Slow flight

NOTE: The objective is to improve the student's ability to recognise inadvertent flight at critically low speeds and provide practice in maintaining the aeroplane / touring motor glider in balance while returning to normal airspeed.

- safety checks
- introduction to slow flight
- controlled flight down to critically slow airspeed
- application of full power with correct attitude and balance to achieve normal climb speed

Exercise 10B: Stalling

- safety checks
- symptoms
- recognition
- clean stall and recovery without power and with power
- recovery when a wing drops
- approach to stall in the approach and in the landing configurations, with and without power, recovery at the incipient stage
- **demonstration of recovery at the incipient spin stage**

NOTE 1: Additional and spin avoidance flight training should be completed during the additional training for the full L**A**PL(A).

NOTE 2: Consideration of manoeuvre limitations and the need to refer to the aeroplane manual and mass and balance calculations.

Exercise 11: Take-off and climb to downwind position

- pre-take-off checks
- into wind take-off
- safeguarding the nosewheel
- crosswind take-off
- drills during and after take-off
- short take-off and soft field procedure/techniques including performance calculations
- noise abatement procedures

Exercise 12: Circuit, approach and landing

- circuit procedures, downwind, base leg
- powered approach and landing
- safeguarding the nosewheel
- effect of wind on approach and touchdown speeds, use of flaps

- crosswind approach and landing
- glide approach and landing
- short landing and soft field procedures/techniques
- flapless approach and landing
- wheel landing (tail wheel aeroplanes)
- missed approach/go around
- noise abatement procedures

Exercise 11/12E: Emergencies

- abandoned take-off
- engine failure after take-off
- mislanding /go-around
- missed approach

In the interests of safety it will be necessary for pilots trained on nosewheel aeroplanes to undergo dual conversion training before flying tail wheel aeroplanes, and vice –versa.

Exercise 13: First solo

- instructor's briefing including limitations
- use of the required equipment
- observation of flight and de-briefing by instructor

NOTE: During flights immediately following the solo circuit consolidation the following should be revised.

- procedures for leaving and rejoining the circuit
- the local area, restrictions, map reading
- turns using magnetic compass, compass errors

Exercise 14: Forced landing without power

- forced landing procedure
- choice of landing area, provision for change of plan
- gliding distance
- descent plan
- key positions
- engine cooling
- engine failure checks
- use of radio
- base leg
- final approach
- landing
- actions after landing

Exercise 15: Precautionary landing

- full procedure away from aerodrome to break-off height
- occasions necessitating
- in-flight conditions
- landing area selection
  - normal aerodrome
  - disused aerodrome
  - ordinary field
- circuit and approach
- actions after landing

Exercise 16A: Navigation (basics)

NOTE 1: Additional navigation flight training should be completed during the additional training for the full L**A**PL(A). The following basic items should be trained:

Flight planning

- weather forecast and actuals
- calculations
  - magnetic heading(s) and time(s) en-route
  - fuel consumption
  - mass and balance
  - mass and performance
- flight information
  - NOTAMS etc.
  - radio frequencies
  - selection of alternate aerodromes
- aeroplane documentation
- notification of the flight
- pre flight administrative procedures

Departure

- organisation of cockpit workload
- departure procedures
  - altimeter settings
  - ATC liaison in regulated airspace
  - setting heading procedure
- maintenance of altitude and heading
- log keeping

- use of radio
- minimum weather conditions for continuation of flight
- in-flight decisions
- diversion procedures
- uncertainty of position procedure
- lost procedure

Arrival, aerodrome joining procedure

- ATC liaison in regulated airspace
- altimeter setting
- entering the traffic pattern
- circuit procedures
- parking
- security of aeroplane / touring motor glider
- refuelling
- post-flight administrative procedures

Exercise 16B: Navigation problems at lower levels and in reduced visibility

- actions prior to descending
- hazards (e.g. obstacles, and terrain)
- effects of wind and turbulence
- vertical situational awareness (avoidance of controlled flight into terrain)
- avoidance of noise sensitive areas
- joining the circuit
- bad weather circuit and landing

Exercise 17: Stopping and re–starting the engine (in the case of TMGs only)

- **engine cooling**
- **switching-off procedure**
- **re–starting of the engine**

AMC No 2 to FCL.110.BLAPL
CREDITING — PRE-ENTRY FLIGHT TEST

The pre-entry flight test referred to in paragraph (b) should cover the total content of the syllabus of flight instruction for the issuance of the Basic LAPL(A), in accordance with AMC No 1 to FCL.110.BLAPL.

GM to FCL.135.BLAPL, to FCL.135.A and to FCL.135.H

Differences and familiarisation training

1. **Differences training requires the acquisition of additional knowledge and training on an appropriate training device or the aircraft.**
2. **Familiarisation training requires the acquisition of additional knowledge.**

~~AMC No 2 to FCL.110.BA/H~~

~~FLIGHT INSTRUCTION FOR THE BASIC LEISURE PILOT LICENCE – BASIC LPL (H)~~

~~1. ENTRY TO TRAINING~~

~~1.1 Before being accepted for training an applicant should be informed that the appropriate medical certificate must be obtained before solo flying is permitted.~~

~~2. FLIGHT INSTRUCTION~~

~~2.1 The Basic LPL(H) flight instruction syllabus should take into account the principles of threat and error management and also cover:~~

~~(a) pre-flight operations, including mass and balance determination, helicopter inspection and servicing;~~

~~(b) aerodrome and traffic pattern operations, collision avoidance precautions and procedures;~~

~~(c) control of the helicopter by external visual reference;~~

~~(d) take-offs, landings, hovering, look out turns and normal transitions from and to the hover;~~

~~(e) emergency procedures, basic autorotations, simulated engine failure, ground resonance recovery if relevant to type;~~

~~(f) sideways and backwards flight, turns on the spot;~~

~~(g) incipient vortex ring recognition and recovery;~~

~~(h) touchdown autorotations or powered recovery, simulated engine-off landings, practice forced landings. Simulated equipment malfunctions and emergency procedures relating to malfunctions of engines, controls, electrical and hydraulic circuits;~~

~~(i) steep turns;~~

~~(j) transitions, quick stops, out of wind manoeuvres and landings and take-offs;~~

~~(k) operations to and from aerodromes and compliance with air traffic services procedures.~~

~~2.2 Before allowing the applicant for a Basic LPL(H) to undertake his/her first solo flight, the flight instructor should ensure that the applicant can operate the required systems and equipment.~~

~~3. SYLLABUS OF FLIGHT INSTRUCTION~~

3.1. ~~The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore the demonstrations and practices need not necessarily be given I the order listed. The actual order and content will depend upon the following interrelated factors:~~

- ~~The applicant's progress and ability~~
- ~~The weather conditions affecting the flight~~
- ~~The flight time available~~
- ~~Instructional technique considerations~~
- ~~The local operating environment~~
- ~~Applicability of the exercises to the helicopter type~~

3.2. ~~Each of the exercises involves the need for the pilot-under-training to be aware the needs of good airmanship and look-out, which should be emphasised at all times.~~

~~Exercise 1a: Familiarisation with the helicopter~~

- ~~characteristics of the helicopter, external features~~
- ~~cockpit layout~~
- ~~systems~~
- ~~check lists, procedures, controls~~

~~Exercise 1b: Emergency procedures~~

- ~~action in the event of fire on the ground and in the air~~
- ~~engine, cabin and electrical system fire~~
- ~~systems failures~~
- ~~escape drills, location and use of emergency equipment and exits~~

~~Exercise 2: Preparation for and action after flight~~

- ~~flight authorisation and helicopter acceptance~~
- ~~serviceability documents~~
- ~~equipment required, maps, etc.~~
- ~~external checks~~
- ~~internal checks~~
- ~~seat, harness and flight controls adjustments~~
- ~~starting and warm up checks clutch engagement, starting rotors~~
- ~~power checks~~
- ~~running down system checks and switching off the engine~~
- ~~parking, security and picketing~~
- ~~completion of authorisation sheet and serviceability documents~~

~~Exercise 3: Air experience~~

- ~~to introduce the student to rotary wing flight~~
- ~~flight exercise~~

~~Exercise 4: Effects of controls~~

- ~~function of flight controls, primary and secondary effect~~
- ~~effect of airspeed~~
- ~~effect of power changes (torque)~~
- ~~effect of yaw(sideslip)~~
- ~~effect of disc loading (bank and flare)~~
- ~~effect on controls of selecting hydraulics on/off~~
- ~~effect of control friction~~
- ~~instruments~~
- ~~use of carburettor heat/anti-icing control~~

~~Exercise 5: Power and attitude changes~~

- ~~relationship between cyclic control position, disc attitude, fuselage attitude, airspeed~~
- ~~flapback~~
- ~~power required diagram in relation to airspeed~~
- ~~power and airspeed changes in level flight~~
- ~~use of instruments for precision~~
- ~~engine and airspeed limitations~~

~~Exercise 6a: Straight and level~~

- ~~at normal cruising power, attaining and maintaining straight and level flight~~
- ~~control in pitch, including use of control friction and/or trim~~
- ~~maintaining direction and balance, (ball/yawstring use)~~
- ~~setting power for selected airspeeds/speed changes~~
- ~~use of instruments for precision~~

~~Exercise 6b: Climbing~~

- ~~optimum climb speed, best angle/rate of climb from power required diagram~~
- ~~initiation, maintaining the normal and maximum rate of climb, levelling off~~
- ~~levelling off at selected altitudes/heights~~
- ~~use of instruments for precision~~

~~Exercise 6c: Descending~~

- ~~optimum descent speed, best angle/rate of descent from power required diagram~~
- ~~initiation, maintaining and levelling off~~
- ~~levelling off at selected altitudes/heights~~
- ~~descent (including effect of power and airspeed)~~
- ~~use of instruments for precision~~

~~Exercise 6d: Turning~~

- ~~initiation and maintaining medium level turns~~
- ~~resuming straight flight~~
- ~~altitude, bank and co-ordination~~
- ~~climbing and descending turns and effect on rate of climb/descent~~
- ~~turns onto selected headings, use of gyro heading indicator and compass~~
- ~~use of instruments for precision~~

~~Exercise 7: Basic autorotation~~

- ~~safety checks, verbal warning, lookout~~
- ~~entry, development and characteristics~~
- ~~control of airspeed and RRPM, rotor and engine limitations~~
- ~~effect of AUM, IAS, disc loading, G forces and density altitude~~
- ~~re-engagement and go around procedures (throttle over-ride/ERPM control)~~
- ~~vortex condition during recovery~~
- ~~gentle/medium turns in autorotation~~
- ~~demonstration of variable flare simulated engine off landing~~

~~Exercise 8a: Hovering~~

- ~~demonstrate hover I.G.E, importance of wind effect and attitude, ground cushion, stability in the hover, effects of over controlling~~
- ~~student holding cyclic stick only~~
- ~~student handling collective lever (and throttle) only~~
- ~~student handling collective lever, (throttle) and pedals~~
- ~~student handling all controls~~
- ~~demonstration of ground effect~~
- ~~demonstration of wind effect~~
- ~~demonstrate gentle forward running touchdown~~
- ~~specific hazards e.g. snow, dust, litter~~

~~Exercise 8b: Hover taxiing, spot turns~~

- ~~revise hovering~~
- ~~precise ground speed/height control~~
- ~~effect of wind direction on helicopter attitude and control margin~~
- ~~control, co-ordination during spot turns~~
- ~~carefully introduce gentle forward running touchdown~~

~~Exercise 8C: Hovering, taxiing emergencies~~

- ~~revise hovering and gentle forward running touchdown, explain (demonstrate where applicable) effect of hydraulics failure in the hover~~
- ~~demonstrate simulated engine failure in the hover and hover taxi~~
- ~~demonstrate dangers of mishandling and over-pitching~~

~~Exercise 9: Take-off and landing~~

- ~~pre-take off checks/drills~~
- ~~lookout procedures~~
- ~~lifting to hover~~
- ~~after take-off checks~~
- ~~danger of horizontal movement near ground~~
- ~~danger of mishandling and overpitching~~
- ~~landing (without sideways or backwards movement)~~
- ~~after landing checks/drills~~
- ~~take-off and landing cross wind, downwind~~

~~Exercise 10: Transitions from hover to climb and approach to hover~~

- ~~lookout procedures~~
- ~~revise take-off and landing~~
- ~~ground effect, translational lift and its effects~~
- ~~flapback and its effects~~
- ~~effect of wind speed/direction during transitions from/to the hover~~
- ~~the constant angle approach~~
- ~~demonstration of variable flare simulated engine off landing~~

~~Exercise 11a: Circuit, approach and landing~~

- ~~revise transitions from hover to climb and approach to hover~~
- ~~circuit procedures, downwind, base leg~~
- ~~approach and landing with power~~
- ~~pre landing checks~~

~~– effect of wind on approach and I.G.E. hover~~

~~– crosswind approach and landing~~

~~– go around~~

~~– noise abatement procedures~~

~~Exercise 11b: Steep and limited power approaches and landings~~

~~– revise the constant angle approach~~

~~– the steep approach (explain danger of high sink rate and low air speed)~~

~~– limited power approach (explain danger of high speed at touch down)~~

~~– use of the ground effect~~

~~– variable flare simulated engine off landing~~

~~Exercise 11c: Emergency procedures~~

~~– abandoned take-off~~

~~– missed approach/go-around~~

~~– hydraulic OFF landing, (if applicable)~~

~~– tail rotor control or tail rotor drive failure (briefing only)~~

~~– simulated emergencies in the circuit to include:~~

~~– hydraulics failure~~

~~– simulated engine failure on take-off, cross wind, downwind and baseleg~~

~~– governor failure~~

~~Exercise 12: First solo~~

~~– instructor's briefing including limitations~~

~~– warn of change of attitude from reduced and laterally displaced weight~~

~~– warn of low tail, low skid/wheel during hover, landing~~

~~– warn of dangers of loss of RRPM and overpitching~~

~~– pre take-off checks~~

~~– into wind take-off~~

~~– procedures during and after take-off~~

~~– normal circuit, approaches and landings~~

~~– action in the event of an Emergency~~

~~– observation of flight and debriefing by instructor~~

~~Exercise 13: Sideways and backwards hover manoeuvring~~

~~– manoeuvring sideways flight heading into wind~~

~~– manoeuvring backwards flight heading into wind~~

- ~~combination of sideways and backwards manoeuvring~~
- ~~manoeuvring sideways and backwards, heading out of wind~~
- ~~stability, weathercocking~~
- ~~recovery from backwards manoeuvring, (pitch nose down)~~
- ~~groundspeed limitations for sideways and backwards manoeuvring~~

~~Exercise 14: Spot turns~~

- ~~revise hovering into wind and downwind~~
- ~~turn on spot through 360º:~~
  - ~~around pilots position~~
  - ~~around tail rotor~~
  - ~~around helicopter geometric centre~~
  - ~~square, safe visibility clearing turn~~
- ~~rotor RPM control, torque effect, cyclic limiting stops due to C of G position and wind speed/direction~~

~~Exercise 15: Hover out of ground effect (OGE), vortex ring~~

- ~~establishing hover O.G.E~~
- ~~drift/height/power control~~
- ~~demonstration of incipient stage of vortex ring, recognition and recovery (from a safe altitude)~~
- ~~loss of tail rotor effectiveness~~

~~Exercise 16: Simulated engine off landings (EOL)~~

- ~~the effect of weight, disc loading, density attitude, RRPM decay~~
- ~~revise basic autorotation entry~~
- ~~optimum use of cyclic and collective to control speed/RRPM~~
- ~~variable flare simulated EOL~~
- ~~demonstrate constant attitude simulated EOL~~
- ~~demonstrate simulated EOL from hover/hover taxi~~
- ~~demonstrate simulated EOL from transition and low level~~

~~Exercise 17: Advanced autorotation~~

- ~~over a selected point at various height and speed~~
- ~~revise basic autorotation - note ground distance covered~~
- ~~range autorotation~~
- ~~low speed autorotation~~
- ~~constant attitude autorotation (terminate at safe altitude)~~
- ~~'S' turns~~

~~– turns through 180° and 360°~~

~~– effects on angles of descent, IAS, RRPM and effect of AUM~~

~~Exercise 18: Practice forced landings~~

~~– procedure and choice of the forced landing area~~

~~– forced landing checks and crash action~~

~~– re-engagement and go-around procedures~~

~~Exercise 19: Transitions~~

~~– revise ground effect, translational lift, flapback~~

~~– maintaining constant height, (20-30 feet AGL):~~

~~– transition from hover to minimum 50 knots IAS and back to hover~~

~~– demonstrate effect of wind~~

~~Exercise 20: Quickstops~~

~~– use of power and controls~~

~~– effect of wind~~

~~– quickstops into wind~~

~~– quickstops from crosswind and downwind terminating into wind~~

~~– danger of vortex ring~~

~~– danger of high disc loading~~

~~Exercise 21a: Basic navigation~~

~~Flight planning~~

~~– weather forecast and actuals~~

~~– map selection and preparation and use~~

~~– calculations~~

~~– magnetic heading(s) and time(s) en-route~~

~~– fuel consumption~~

~~– mass and balance~~

~~– flight information~~

~~– NOTAMs etc~~

~~– radio frequencies~~

~~– selection of alternate landing sites~~

~~– helicopter documentation~~

~~– notification of the flight~~

~~– pre-flight administrative procedures~~

~~Departure~~

- ~~organisation of cockpit workload~~
- ~~departure procedures~~
  - ~~altimeter settings~~
  - ~~ATC liaison in controlled/regulated airspace~~
  - ~~setting heading procedure~~
- ~~maintenance of height/altitude and heading~~
- ~~use of radio~~
- ~~minimum weather conditions for continuation of flight~~
- ~~in-flight decisions~~
- ~~transiting controlled/regulated airspace~~
- ~~uncertainty of position procedure~~
- ~~lost procedure~~

~~Arrival, aerodrome joining procedure~~

- ~~ATC liaison in controlled/regulated airspace~~
- ~~altimeter setting~~
- ~~entering the traffic pattern~~
- ~~circuit procedures~~
- ~~parking~~
- ~~security of helicopter~~
- ~~refuelling~~
- ~~post-flight administrative procedures~~

~~Exercise 21b: Navigation problems at low heights and in reduced visibility~~

- ~~actions prior to descending~~
- ~~hazards (e.g. obstacles, other aircraft)~~
- ~~difficulties of map reading~~
- ~~effects of wind and turbulence~~
- ~~avoidance of noise sensitive areas~~
- ~~joining the circuit~~
- ~~bad weather circuit and landing~~
- ~~appropriate procedures and choice of landing area~~

~~Exercise 22: Advanced take-off, landings, transitions~~

- ~~landing and take-off out of wind (performance reduction)~~
- ~~ground effect, translational lift and directional stability variation when out of wind~~
- ~~downwind transitions~~
- ~~vertical takeoff over obstacles~~

~~— reconnaissance of landing site~~

~~— running landing~~

~~— zero speed landing~~

~~— cross wind and downwind landings~~

~~— steep approach~~

~~— go-around~~

~~Exercise 23: Limited power~~

~~— take-off power check~~

~~— vertical take-off over obstacles~~

~~— in flight power check~~

~~— running landing~~

~~— zero speed landing~~

~~— approach to low hover~~

~~— approach to hover~~

~~— approach to hover OGE~~

~~— steep approach~~

~~— go-around~~

AMC No 1 to FCL.110.A

FLIGHT INSTRUCTION FOR THE LIGHT AIRCRAFT~~EISURE~~ PILOT LICENCE — LAPL (A)

1. ENTRY TO TRAINING

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

2. FLIGHT INSTRUCTION

   2.1 The L**A**PL (A) flight instruction syllabus should take into account the principles of threat and error management and also cover:

      (a) pre-flight operations, including mass and balance determination, aircraft inspection and servicing;

      (b) aerodrome and traffic pattern operations, collision avoidance precautions and procedures;

      (c) control of the aircraft by external visual reference;

      (d) flight at critically low airspeeds, recognition of, and recovery from, incipient and full stalls;

      (e) flight at critically high airspeeds, recognition of, and recovery from, spiral dive;

      (f) normal and crosswind take-offs and landings;

(g) maximum performance (short field and obstacle clearance) take-offs, short-field landings;

(h) cross-country flying using visual reference, dead reckoning and radio navigation aids;

(i) emergency operations, including simulated aeroplane equipment malfunctions; and

(j) operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures and communication procedures

2.2 Before allowing the applicant for a L**A**PL(A) to undertake his/her first solo flight, the flight instructor should ensure that the applicant can operate the required systems and equipment..

3. SYLLABUS OF FLIGHT INSTRUCTION

3.1. The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore the demonstrations and practices need not necessarily be given I the order listed. The actual order and content will depend upon the following interrelated factors:

- The applicant's progress and ability
- The weather conditions affecting the flight
- The flight time available
- Instructional technique considerations
- The local operating environment
- Applicability of the exercises to the aeroplane / touring motor glider type

3.2. Each of the exercises involves the need for the pilot-under-training to be aware the needs of good airmanship and look-out, which should be emphasised at all times.

Exercise 1: Familiarisation with the aeroplane/touring motor glider

- characteristics of the aeroplane/touring motor glider
- cockpit layout
- systems
- check lists, drills, controls

Exercise 1E: Emergency drills

- action in the event of fire on the ground and in the air
- engine cabin and electrical system fire
- systems failure
- escape drills, location and use of emergency equipment and exits

Exercise 2: Preparation for and action after flight

- flight authorisation and aeroplane/touring motor glider acceptance
- serviceability documents

- equipment required, maps, etc.
- external checks
- internal checks
- harness, seat or rudder panel adjustments
- starting and warm up checks
- power checks
- running down system checks and switching off the engine
- parking, security and picketing (e.g. tie down)
- completion of authorisation sheet and serviceability documents

Exercise 3: Air experience

- flight exercise

Exercise 4: Effects of controls

- primary effects when laterally level and when banked
- further effects of aileron and rudder
- effects of:
  - airspeed
  - slipstream
  - power
  - trimming controls
  - flaps
  - other controls, as applicable
- operation of:
  - mixture control
  - carburettor heat
  - cabin heating/ventilation

Exercise 5: Taxiing

- pre-taxi checks
- starting, control of speed and stopping
- engine handling
- control of direction and turning
- turning in confined spaces
- parking area procedure and precautions
- effects of wind and use of flying controls
- effects of ground surface
- freedom of rudder movement
- marshalling signals

— instrument checks

— air traffic control procedures

Exercise 5E: Emergencies

— Brake and steering failure

Exercise 6: Straight and level

— at normal cruising power, attaining and maintaining straight and level flight

— flight at critically high airspeeds

— demonstration of inherent stability

— control in pitch, including use of trim

— lateral level, direction and balance, trim

— at selected airspeeds (use of power)

— during speed and configuration changes

— use of instruments for precision

Exercise 7: Climbing

— entry, maintaining the normal and max rate climb, levelling off

— levelling off at selected altitudes

— en-route climb (cruise climb)

— climbing with flap down

— recovery to normal climb

— maximum angle of climb

— use of instruments for precision

Exercise 8: Descending

— entry, maintaining and levelling off

— levelling off at selected altitudes

— glide, powered and cruise descent (including effect of power and airspeed)

— side slipping (or suitable types)

— use of instruments for precision flight

Exercise 9: Turning

— entry and maintaining medium level turns

— resuming straight flight

— faults in the turn — (in correct pitch, bank, balance)

— climbing turns

— descending turns

— slipping turns (or suitable types)

- turns onto selected headings, use of gyro heading indicator and compass
- use of instruments for precision

Exercise 10A: Slow flight

NOTE: The objective is to improve the student’s ability to recognise inadvertent flight at critically low speeds and provide practice in maintaining the aeroplane/touring motor glider in balance while returning to normal airspeed.

- safety checks
- introduction to slow flight
- controlled flight down to critically slow airspeed
- application of full power with correct attitude and balance to achieve normal climb speed

Exercise 10B: Stalling

- safety checks
- symptoms
- recognition
- clean stall and recovery without power and with power
- recovery when a wing drops
- approach to stall in the approach and in the landing configurations, with and without power, recovery at the incipient stage

Exercise 11: Spin avoidance

- **safety checks**
- **stalling and recovery at the incipient spin stage (stall with excessive wing drop, about 45°)**
- **instructor induced distractions during the stall**

Exercise 1**2**~~1~~: Take-off and climb to downwind position

- pre-take-off checks
- into wind take-off
- safeguarding the nosewheel (if applicable)
- crosswind take-off
- drills during and after take-off
- short take-off and soft field procedure/techniques including performance calculations
- noise abatement procedures

Exercise 1**3**~~2~~: Circuit, approach and landing

- circuit procedures, downwind, base leg
- powered approach and landing
- safeguarding the nosewheel (if applicable)

- effect of wind on approach and touchdown speeds, use of flaps
- crosswind approach and landing
- glide approach and landing
- short landing and soft field procedures/techniques
- flapless approach and landing
- wheel landing (tail wheel aeroplanes)
- missed approach/go around
- noise abatement procedures

Exercise 1**2**~~1~~/1~~2~~**3**E: Emergencies

- abandoned take-off
- engine failure after take-off
- mislanding / go-around
- missed approach

In the interests of safety it will be necessary for pilots trained on nosewheel aeroplanes **or touring motor gliders** to undergo dual conversion training before flying tail wheel aeroplanes **or touring motor gliders**, and vice versa.

Exercise 1**4**~~3~~: First solo

- instructor's briefing including limitations,
- use of required equipment
- observation of flight and de-briefing by instructor

NOTE: During flights immediately following the solo circuit consolidation the following should be revised.

- procedures for leaving and rejoining the circuit
- the local area, restrictions, map reading
- use of radio aids for homing
- turns using magnetic compass, compass errors

Exercise 1**5**~~4~~: Advanced turning

- steep turns (45°), level and descending
- stalling in the turn and recovery
- recoveries from unusual attitudes, including spiral dives

Exercise 1**6**~~5~~: Forced landing without power

- forced landing procedure
- choice of landing area, provision for change of plan
- gliding distance
- descent plan
- key positions
- engine cooling

- engine failure checks
- use of radio
- base leg
- final approach
- landing
- actions after landing

Exercise 1**7**~~6~~: Precautionary landing

- full procedure away from aerodrome to break-off height
- occasions necessitating
- in-flight conditions
- landing area selection
    - normal aerodrome
    - disused aerodrome
    - ordinary field
- circuit and approach
- actions after landing

Exercise 1**8**~~7~~A: Navigation

Flight planning

- weather forecast and actuals
- map selection and preparation
    - choice of route
    - airspace structure
    - safety altitudes
- calculations
    - magnetic heading(s) and time(s) en-route
    - fuel consumption
    - mass and balance
    - mass and performance
- flight information
    - NOTAMS etc.
    - radio frequencies
    - selection of alternate aerodromes
- aeroplane / touring motor glider documentation
- notification of the flight
    - pre-flight administrative procedures
    - flight plan form

Departure

- organisation of cockpit workload
- departure procedures
  - altimeter settings
  - ATC liaison in regulated airspace
  - setting heading procedure
  - noting of ETAs
- maintenance of altitude and heading
- revisions of ETA and heading
- log keeping
- use of radio
- minimum weather conditions for continuation of flight
- in-flight decisions
- transiting controlled/regulated airspace
- diversion procedures
- uncertainty of position procedure
- lost procedure

Arrival, aerodrome joining procedure

  - ATC liaison in regulated airspace
  - altimeter setting
  - entering the traffic pattern
  - circuit procedures
- parking
- security of aeroplane/touring motor glider
- refuelling
- closing of flight plan, if appropriate
- post-flight administrative procedures

Exercise 1**8**~~7~~B: Navigation problems at lower levels and in reduced visibility

- actions prior to descending
- hazards (e.g. obstacles, and terrain)
- difficulties of map reading
- effects of wind and turbulence
- vertical situational awareness (avoidance of controlled flight into terrain)
- avoidance of noise sensitive areas
- joining the circuit

— bad weather circuit and landing

Exercise 1~~7~~**8**C: Radio navigation (basics)

Use of Global Navigation Satellite Systems **or VOR/ADF**

– selection of waypoints**/stations**

– to/from indications, orientation

– error messages

Use of VHF direction finding (VHF/DF)

— availability, AIP, frequencies

— R/T procedures and ATC liaison

— obtaining a QDM and homing

Use of en-route/terminal radar

— availability, AIP

— procedures and ATC liaison

— pilot's responsibilities

— secondary surveillance radar

— transponders

— code selection

— interrogation and reply

Exercise 19: Stopping and re–starting the engine (in the case of TMGs only)

— engine cooling

— switching-off procedure

— re–starting of the engine

AMC No 2 to FCL.110.A

CREDITING — PRE-ENTRY FLIGHT TEST

The pre-entry flight test referred to in paragraph (d) should cover the total content of the syllabus of flight instruction for the issuance of the LAPL(A), in accordance with AMC No 1 to FCL.110.A.

AMC No 1 to FCL.110.H

FLIGHT INSTRUCTION FOR THE LIGHT AIRCRAFT~~EISURE~~ PILOT LICENCE — LAPL (H)

1. ENTRY TO TRAINING

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

2. FLIGHT INSTRUCTION

2.1 The L**A**PL(H) flight instruction syllabus should take into account the principles of threat and error management and also cover:

(a) pre-flight operations, including mass and balance determination, helicopter inspection and servicing;

(b) aerodrome and traffic pattern operations, collision avoidance precautions and procedures;

(c) control of the helicopter by external visual reference;

(d) take-offs, landings, hovering, look out turns and normal transitions from and to the hover;

(e) emergency procedures, basic autorotations, simulated engine failure, ground resonance recovery if relevant to type;

(f) sideways and backwards flight, turns on the spot;

(g) incipient vortex ring recognition and recovery;

(h) touchdown autorotations, simulated engine-off landings, practice forced landings. Simulated equipment malfunctions and emergency procedures relating to malfunctions of engines, controls, electrical and hydraulic circuits;

(i) steep turns;

(j) transitions, quick stops, out of wind manoeuvres, sloping ground landings and take-offs;

(k) limited power and confined area operations including selection of and operations to and from unprepared sites;

(l) cross-country flying by using visual reference, dead reckoning and, where available, radio navigation aids;

(m) operations to and from aerodromes; compliance with air traffic services procedures and communication procedures.

2.2 Before allowing the applicant for a L**A**PL(H) to undertake his/her first solo flight, the flight instructor should ensure that the applicant can operate the required systems and equipment.

3. SYLLABUS OF FLIGHT INSTRUCTION

3.1. The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore the demonstrations and practices need not necessarily be given I the order listed. The actual order and content will depend upon the following interrelated factors:

— The applicant’s progress and ability

— The weather conditions affecting the flight

— The flight time available

— Instructional technique considerations

— The local operating environment

— Applicability of the exercises to the helicopter type

3.2. Each of the exercises involves the need for the pilot-under-training to be aware the needs of good airmanship and look-out, which should be emphasised at all times.

Exercise 1a: Familiarisation with the helicopter

- characteristics of the helicopter, external features
- cockpit layout
- systems
- check lists, procedures, controls

Exercise 1b: Emergency procedures

- action in the event of fire on the ground and in the air
- engine, cabin and electrical system fire
- systems failures
- escape drills, location and use of emergency equipment and exits

Exercise 2: Preparation for and action after flight

- flight authorisation and helicopter acceptance
- serviceability documents
- equipment required, maps, etc.
- external checks
- internal checks
- seat, harness and flight controls adjustments
- starting and warm up checks clutch engagement, starting rotors
- power checks
- running down system checks and switching off the engine
- parking, security and picketing
- completion of authorisation sheet and serviceability documents

Exercise 3: Air experience

- to introduce the student to rotary wing flight
- flight exercise

Exercise 4: Effects of controls

- function of flight controls, primary and secondary effect
- effect of airspeed
- effect of power changes (torque)
- effect of yaw(sideslip)
- effect of disc loading (bank and flare)
- effect on controls of selecting hydraulics on/off
- effect of control friction

- instruments
- use of carburettor heat/anti-icing control

Exercise 5: Power and attitude changes

- relationship between cyclic control position, disc attitude, fuselage attitude, airspeed
- flapback
- power required diagram in relation to airspeed
- power and airspeed changes in level flight
- use of instruments for precision
- engine and airspeed limitations

Exercise 6a: Straight and level

- at normal cruising power, attaining and maintaining straight and level flight
- control in pitch, including use of control friction and/or trim
- maintaining direction and balance, (ball/yawstring use)
- setting power for selected airspeeds/speed changes
- use of instruments for precision

Exercise 6b: Climbing

- optimum climb speed, best angle/rate of climb from power required diagram
- initiation, maintaining the normal and maximum rate of climb, levelling off
- levelling off at selected altitudes/heights
- use of instruments for precision

Exercise 6c: Descending

- optimum descent speed, best angle/rate of descent from power required diagram
- initiation, maintaining and levelling off
- levelling off at selected altitudes/heights
- descent (including effect of power and airspeed)
- use of instruments for precision

Exercise 6d: Turning

- initiation and maintaining medium level turns
- resuming straight flight
- altitude, bank and coordination
- climbing and descending turns and effect on rate of climb/descent
- turns onto selected headings, use of gyro heading indicator and compass

- use of instruments for precision

Exercise 7: Basic autorotation

- safety checks, verbal warning, lookout
- entry, development and characteristics
- control of airspeed and RRPM, rotor and engine limitations
- effect of AUM, IAS, disc loading, G forces and density altitude
- re-engagement and go around procedures (throttle over-ride/ERPM control)
- vortex condition during recovery
- gentle/medium turns in autorotation
- demonstration of variable flare simulated engine off landing

Exercise 8a: Hovering

- demonstrate hover I.G.E, importance of wind effect and attitude, ground cushion, stability in the hover, effects of over controlling
- student holding cyclic stick only
- student handling collective lever (and throttle) only
- student handling collective lever, (throttle) and pedals
- student handling all controls
- demonstration of ground effect
- demonstration of wind effect
- demonstrate gentle forward running touchdown
- specific hazards e.g. snow, dust, litter

Exercise 8b: Hover taxiing, spot turns

- revise hovering
- precise ground speed/height control
- effect of wind direction on helicopter attitude and control margin
- control, coordination during spot turns
- carefully introduce gentle forward running touchdown

Exercise 8C: Hovering, taxiing emergencies

- revise hovering and gentle forward running touchdown, explain (demonstrate where applicable) effect of hydraulics failure in the hover
- demonstrate simulated engine failure in the hover and hover taxi
- demonstrate dangers of mishandling and over-pitching

Exercise 9: Take-off and landing

- pre-take off checks/drills
- lookout

- lifting to hover
- after take-off checks
- danger of horizontal movement near ground
- danger of mishandling and overpitching
- landing (without sideways or backwards movement)
- after landing checks/drills
- take-off and landing cross wind, downwind

Exercise 10: Transitions from hover to climb and approach to hover

- lookout
- revise take-off and landing
- ground effect, translational lift and its effects
- flapback and its effects
- effect of wind speed/direction during transitions from/to the hover
- the constant angle approach
- demonstration of variable flare simulated engine off landing

Exercise 11a: Circuit, approach and landing

- revise transitions from hover to climb and approach to hover
- circuit procedures, downwind, base leg
- approach and landing with power
- pre landing checks
- effect of wind on approach and I.G.E. hover
- crosswind approach and landing
- go around
- noise abatement procedures

Exercise 11b: Steep and limited power approaches and landings

- revise the constant angle approach
- the steep approach (explain danger of high sink rate and low air speed)
- limited power approach (explain danger of high speed at touch down)
- use of the ground effect
- variable flare simulated engine off landing

Exercise 11c: Emergency procedures

- abandoned take-off
- missed approach/go-around
- hydraulic OFF landing (if applicable)

- tail rotor control or tail rotor drive failure (briefing only)
- simulated emergencies in the circuit to include:
  - hydraulics failure
  - simulated engine failure on take-off, cross wind, downwind and baseleg
- governor failure

Exercise 12: First solo

- instructor's briefing, observation of flight and debriefing
- warn of change of attitude from reduced and laterally displaced weight
- warn of low tail, low skid/wheel during hover, landing
- warn of dangers of loss of RRPM and overpitching
- pre take-off checks
- into wind take-off
- procedures during and after take-off
- normal circuit, approaches and landings
- action in the event of an Emergency

Exercise 13: Sideways and backwards hover manoeuvring

- manoeuvring sideways flight heading into wind
- manoeuvring backwards flight heading into wind
- combination of sideways and backwards manoeuvring
- manoeuvring sideways and backwards, heading out of wind
- stability, weathercocking
- recovery from backwards manoeuvring, (pitch nose down)
- groundspeed limitations for sideways and backwards manoeuvring

Exercise 14: Spot turns

- revise hovering into wind and downwind
- turn on spot through 360º:
  - around pilots position
  - around tail rotor
  - around helicopter geometric centre
  - square, safe visibility clearing turn
- rotor RPM control, torque effect, cyclic limiting stops due to C of G position and wind speed/direction

Exercise 15: Hover out of ground effect (OGE), vortex ring

- establishing hover O.G.E
- drift/height/power control

- demonstration of incipient stage of vortex ring, recognition and recovery (from a safe altitude)
- loss of tail rotor effectiveness

Exercise 16: Simulated engine off landings (EOL)

- the effect of weight, disc loading, density attitude, RRPM decay
- revise basic autorotation entry
- optimum use of cyclic and collective to control speed/RRPM
- variable flare simulated EOL
- demonstrate constant attitude simulated EOL
- demonstrate simulated EOL from hover/hover taxi
- demonstrate simulated EOL from transition and low level

Exercise 17: Advanced autorotation

- over a selected point at various height and speed
- revise basic autorotation — note ground distance covered
- range autorotation
- low speed autorotation
- constant attitude autorotation (terminate at safe altitude)
- 'S' turns
- turns through 180° and 360°
- effects on angles of descent, IAS, RRPM and effect of AUM

Exercise 18: Practice forced landings

- procedure and choice of the forced landing area
- forced landing checks and crash action
- re-engagement and go-around procedures

Exercise 19: Steep turns

- steep (level) turns (30° bank)
- maximum rate turns (45° bank if possible)
- steep autorotative turns
- faults in the turn — balance, attitude, bank and coordination
- RRPM control, disc loading
- vibration and control feedback
- effect of wind at low level

Exercise 20: Transitions

- revise ground effect, translational lift, flapback
- maintaining constant height, (20–30 feet AGL):

    - transition from hover to minimum 50 knots IAS and back to hover
- demonstrate effect of wind

Exercise 21: Quickstops

- use of power and controls
- effect of wind
- quickstops into wind
- quickstops from crosswind and downwind terminating into wind
- danger of vortex ring
- danger of high disc loading

Exercise 22a: Navigation

Flight planning

- weather forecast and actuals
- map selection and preparation and use
- choice of route
    - controlled airspace, danger and prohibited areas
    - safety altitudes and noise abatement considerations
- calculations
- magnetic heading(s) and time(s) en-route
- fuel consumption
- mass and balance
- flight information
    - NOTAMs etc
    - radio frequencies
    - selection of alternate landing sites
- helicopter documentation
- notification of the flight
    - pre-flight administrative procedures
    - flight plan form (where appropriate)

Departure

- organisation of cockpit workload
- departure procedures
    - altimeter settings
    - ATC liaison in regulated airspace
    - setting heading procedure
    - noting of ETAs

- maintenance of height/altitude and heading
- revisions of ETA and heading
  - 10º line, double track and track error, closing angle
  - 1 in 60 rule
  - amending an ETA
- log keeping
- use of radio
- minimum weather conditions for continuation of flight
- in-flight decisions
- transiting controlled/regulated airspace
- uncertainty of position procedure
- lost procedure

Arrival, aerodrome joining procedure

  - ATC liaison in regulated airspace
  - altimeter setting
  - entering the traffic pattern
  - circuit procedures
- parking
- security of helicopter
- refuelling
- closing of flight plan, (if appropriate)
- post-flight administrative procedures

Exercise 22b: Navigation problems at low heights and in reduced visibility

- actions prior to descending
- hazards (e.g. obstacles, other aircraft)
- difficulties of map reading
- effects of wind and turbulence
- avoidance of noise sensitive areas
- joining the circuit
- bad weather circuit and landing
- appropriate procedures and choice of landing area **for precautionary landings**

Exercise 22C : Radio navigation (basics)

Use of Global Positioning Systems **or VOR/NDB**

- Selection of waypoints
- to/from indications, orientation

- error messages

Use of VHF direction finding (VHF/DF)

- availability, AIP, frequencies
- R/T procedures and ATC liaison
- obtaining a QDM and homing

Use of en-route/terminal radar

- availability, AIP
- procedures and ATC liaison
- pilot's responsibilities
- secondary surveillance radar
  - transponders
  - code selection
  - interrogation and reply

Exercise 23: Advanced take-off, landings, transitions

- landing and take-off out of wind (performance reduction)
- ground effect, translational lift and directional stability variation when out of wind
- downwind transitions
- vertical takeoff over obstacles
- reconnaissance of landing site
- running landing
- zero speed landing
- cross wind and downwind landings
- steep approach
- go-around

Exercise 24: Sloping ground

- limitations, assessing slope angle
- wind and slope relationship — blade and control stops
- effect of C of G when on slope
- ground effect on slope, power required
- right skid up slope
- left skid up slope
- nose up slope
- avoidance of dynamic roll over, dangers soft ground and sideways movement on touchdown
- danger of striking main/tail rotor by harsh control movement near ground

Exercise 25: Limited power

- take-off power check
- vertical take-off over obstacles
- in flight power check
- running landing
- zero speed landing
- approach to low hover
- approach to hover
- approach to hover OGE
- steep approach
- go-around

Exercise 26: Confined areas

- landing capability, performance assessment
- locating landing site, assessing wind speed/direction
- reconnaissance of landing site
- select markers
- select direction and type of approach
- circuit
- approach to committed point and go around
- approach
- clearing turn
- landing
- power check, performance assessment in and out of ground effect
- normal take-off to best angle of climb speed
- vertical take-off from hover

AMC No 2 to FCL.110.H

CREDITING — PRE-ENTRY FLIGHT TEST

The pre-entry flight test referred to in paragraph (b) should cover the total content of the syllabus of flight instruction for the issuance of the LAPL(H), in accordance with AMC No 1 to FCL.110.H.

AMC No 1 to FCL.110.S and to FCL.210.S

FLIGHT INSTRUCTION FOR THE LIGHT AIRCRAFT~~EISURE~~ PILOT LICENCE (SAILPLANES) AND THE SAILPLANE PILOT LICENCE (SPL)

1. ENTRY TO TRAINING

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

2. FLIGHT INSTRUCTION

2.1 The L**A**PL (S) / SPL flight instruction syllabus should take into account the principles of threat and error management and also cover:

(a) pre-flight operations, including verifying mass and balance, aircraft inspection and servicing**, airspace and weather briefing;**~~;~~

(b) aerodrome and traffic pattern operations, collision avoidance precautions and procedures;

(c) control of the aircraft by external visual reference;

(d) flight at high angle of attack (critically low airspeeds), recognition of, and recovery from, incipient and full stalls and spins;

(e) flight at critically high airspeeds, recognition of, and recovery from spiral dive;

(f) normal and crosswind take-offs in respect with the different launch methods;

(g) normal and crosswind landings

(h) short field landings and outlandings — field selection, circuit and landing hazards and precautions

(i) cross-country flying using visual reference, dead reckoning and available navigation aids;

(j) soaring techniques as appropriate to site conditions

(k) emergency actions

(l) compliance with air traffic services procedures and communication procedures.

2.2 Before allowing the applicant for a L**A**PL(S) / SPL to undertake his/her first solo flight, the flight instructor should ensure that the applicant can operate the required systems and equipment.

3. SYLLABUS OF FLIGHT INSTRUCTION

3.1 The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore the demonstrations and practices need not necessarily be given in the order listed. The actual order and content will depend upon the following interrelated factors:

- The applicant's progress and ability
- The weather conditions affecting the flight
- The flight time available
- Instructional technique considerations
- The local operating environment
- Applicability of the exercises to the sailplane type

3.2 At the discretion of the instructors some of the exercises may be combined and some other exercises may be done in several flights.

3.3 At least the exercises 1–12 have to be completed prior to the first solo flight.

3.~~3~~**4** Each of the exercises involves the need for the pilot-under-training to be aware **of** the needs **for**~~of~~ good airmanship and look-out, which should be emphasised at all times.

Exercise 1: Familiarisation with the sailplane

- characteristics of the sailplane
- cockpit layout — instruments and equipment
- flight controls — stick, pedals, airbrakes, flaps, **trim**
- cable release, undercarriage
- check lists, drills, controls

Exercise 2: Procedures in the event of emergencies

- use of safety equipment (parachute)
- action in the event of system failures
- bail-out procedures

Exercise 3: Preparation for flight

- pre-flight briefings
- required documents on board
- equipment required for the intended flight
- ground handling / movements/ tow out, parking, security
- pre-flight external and internal checks
- verifying in-limits mass and balance
- harness, seat and/or rudder panel adjustments
- **passenger handling**
- pre-launch checks

Exercise 4: Initial air experience

- area familiarization
- lookout procedures

Exercise 5: Effects of controls

- lookout procedures
- use of visual references
- primary effects when laterally level and when banked
- reference attitude and effect of elevator
- relationship between attitude and speed
- effects of:

— flaps (if available)

— airbrakes

Exercise 6: **Coordinated rolling** ~~Moderate Banki~~**to and from moderate angles of bank**~~ng and Coordination~~

— lookout procedures

— further effects of aileron (adverse yaw) and rudder (roll)

— coordination

— **rolling to and from**~~banking at~~ moderate angle**s of bank**, return to **straight**~~level~~ flight

Exercise 7: Straight flying

— lookout procedures

— maintaining straight flight

— flight at critically high airspeeds

— demonstration of inherent pitch stability

— control in pitch, including use of trim

— lateral level, direction and balance, trim

— airspeed: instrument monitoring and control

Exercise 8: Turning

— lookout procedures

— demonstration and correction of adverse yaw

— entry to turn (medium level turns)

— stabilizing turns

— exiting turns

— faults in the turn (slipping / skidding)

— turns on to selected headings, use of compass

— use of instruments (ball indicator and/or slip string) for precision

Exercise 9A: Slow flight

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

— safety checks

— introduction to characteristics of slow flight

— controlled flight down to critically high angle of attack (slow airspeed)

Exercise 9B: Stalling

— safety checks

— pre-stall symptoms, recognition and recovery

— stall symptoms, recognition and recovery

— recovery when a wing drops

— approach to stall in the approach and in the landing — configurations

— recognition and recovery from accelerated stalls

Exercise 10: Spin recognition **and**~~ and~~ **spin** avoidance

— safety checks

— stalling and recovery at the incipient spin stage (stall with excessive wing drop, about 45°)

— **entry into fully developed spins (if suitable training aircraft available)**

— **recognition of full spins (if suitable training aircraft available)**

— **standard spin recovery (if suitable training aircraft available)**

— **i**~~I~~nstructor induced distractions during the spin entry **(if suitable training aircraft available)**

NOTE: Consideration of manoeuvre limitations and the need to refer to the sailplane manual and mass and balance calculations. **If no suitable training aircraft is available to demonstrate the fully developed spin, all the aspects related to these training items have to be covered by specific theoretical instruction.**

Exercise 11: Take-off/Launch methods

NOTE: At least one launch method must be taught containing all the subject below.

Exercise 11A: Winch launch

— signals and/or communication before and during launch

— use of the launching equipment

— pre-take-off checks

— into wind take-off

— crosswind take-off

— optimum profile of winch launch and limitations

— **release procedures**

— launch failure procedures

Exercise 11B: Aero tow

— signals and/or communication before and during launch

— use of the launch equipment

— pre-take-off checks

— into wind take-off

— crosswind take-off

- on tow — straight flight / turning / slip stream
- out of position in tow and recovery
- descending on tow (towing aircraft and sailplane)
- **release procedures**
- launch failure and abandonment

Exercise 11C: Self-launch

- engine extending and retraction procedures
- engine starting and safety precautions
- pre-take-off checks
- noise abatement procedures
- checks during and after take off
- into wind take-off
- crosswind take-off
- power failures/procedures
- abandoned take-off
- maximum performance (short field and obstacle clearance) take-off
- short take-off and soft field procedure/techniques and performance calculations

Exercise 11D: Car launch

- signals before and during launch
- use of the launch equipment
- pre-take-off checks
- into wind take-off
- crosswind take-off
- optimum launch profile and limitations
- **release procedures**
- launch failure procedures

Exercise 11E: Bungee launch

- signals before and during launch
- use of the launch equipment
- pre-take-off checks
- into wind take-off

~~Exercise 12: Soaring techniques~~

~~Exercise 12A: Thermalling~~

~~lookout procedures~~

~~detection and recognition of thermals~~

~~use of audio soaring instruments~~

~~joining a thermal and giving way~~

~~flying in close proximity to other sailplanes~~

~~centring in thermals~~

~~leaving thermals~~

~~Exercise 12B: Ridge flying (if applicable during training and if possible at training site)~~

~~lookout procedures~~

~~practical application of ridge flying rules~~

~~optimisation of flight path~~

~~speed control~~

~~Exercise 12C: Wave flying (if applicable during training and if possible at training site)~~

~~lookout procedures~~

~~wave access techniques~~

~~speed limitations with increasing height~~

~~of oxygen~~

Exercise 1**2**~~3~~: Circuit, approach and landing

- procedures for rejoining the circuit
- collision avoidance, look out techniques and procedures
- **pre-landing checks**
- circuit procedures, downwind, base leg
- effect of wind on approach and touchdown speeds
- use of flaps (if applicable)
- visualisation of an aiming point
- approach control and use of airbrakes
- normal and crosswind approach and landing
- short landing procedures/techniques

Exercise 13: First solo

- **instructor’s briefing including limitations**
- **awareness of local area, restrictions**
- **use of required equipment**
- **observation of flight and debriefing by instructor**

~~Exercise 14: First solo~~

- ~~instructor’s briefing including limitations~~
- ~~awareness of local area, restrictions~~
- ~~use of required equipment~~

~~— observation of flight and debriefing by instructor~~

Exercise 1**4**~~5~~: Advanced turning

- steep turns (45°)
- stalling and spin avoidance in the turn and recovery
- recoveries from unusual attitudes, including spiral dives

Exercise 15: Soaring techniques

NOTE: At least one of the three soaring techniques must be taught containing all subjects below.

Exercise 15A: Thermalling

- **lookout procedures**
- **detection and recognition of thermals**
- **use of audio soaring instruments**
- **joining a thermal and giving way**
- **flying in close proximity to other sailplanes**
- **centring in thermals**
- **leaving thermals**

Exercise 15B: Ridge flying

- **lookout procedures**
- **practical application of ridge flying rules**
- **optimisation of flight path**
- **speed control**

Exercise 15C: Wave flying

- **lookout procedures**
- **wave access techniques**
- **speed limitations with increasing height**
- **use of oxygen**

Exercise 16: Out-landings

- gliding range
- re–start procedures (only for self-launching and self-sustaining sailplanes)
- selection of landing area
- circuit judgement and key positions
- circuit and approach procedures
- actions after landing

Exercise 17: Cross country flying

NOTE: If the required cross country flight will be conducted as a solo cross country flight all the subjects below must be taught before.

Exercise 17A: Flight Planning

- weather forecast and actuals
- NOTAMS, airspace considerations
- map selection and preparation
- route planning
- radio frequencies (if applicable)
- pre-flight administrative procedure
- flight plan where required
- mass and performance
- alternate aerodromes and landing areas
- safety altitudes

Exercise 17B: In-Flight Navigation

- maintaining track and re-routing considerations
- use of radio and phraseology **(if applicable)**
- in-flight planning
- procedures for transiting regulated airspace / ATC liaison where required
- uncertainty of position procedure
- lost procedure
- use of additional equipment where required
- joining, arrival and circuit procedures at remote aerodrome

Exercise 17C: Cross country techniques

- lookout procedures
- maximising potential cross-country performance
- risk reduction and threat reaction

AMC No 2 to FCL.110.S and to FCL.210.S
CREDITING — PRE-ENTRY FLIGHT TEST

The pre-entry flight test referred to in paragraph (c) should cover the total content of the syllabus of flight instruction for the issuance of the LAPL(S) or the SPL, in accordance with AMC No 1 to FCL.110.S and to FCL.210.S.

AMC to FCL.135.S and FCL.225.S

Extension of privileges to touring motor gliders -— LAPL(S) and SPL

1. The aim of the flight training is to qualify L**A**PL(S)/SPL holders to exercise the privileges of the licence on a TMG.
2. The approved training organisation should issue a certificate of satisfactory completion of the training.

3. THEORETICAL KNOWLEDGE

The theoretical knowledge syllabus should cover the revision and/or explanation of:

3.1. Principles of flight

- operating limitations (addition touring motor gliders)
- propellers
- flight mechanics

3.2. Operational Procedures for touring motor gliders

- special operational procedures and hazards
- emergency procedures

3.3 Flight performance and planning

- mass and balance considerations
- loading
- CG calculation
- load and trim sheet
- performance of touring motor gliders
- flight planning for VFR flights
- fuel planning
- pre-flight preparation
- ICAO flight plan
- flight monitoring and in-flight re-planning

3.4. Aircraft general knowledge

- system designs, loads, stresses, maintenance
- airframe

~~Hydraulics~~

- landing gear, wheels, tyres, brakes
- fuel system
- electrics
- piston engines
- propellers
- instrument and indication systems

~~measurement of aerodynamic parameters~~

3.5. Navigation

- dead reckoning navigation (addition powered flying elements)
- in flight navigation (addition powered flying elements)
- basic radio propagation theory

- radio aids (basics)
- radar (basics)
- global navigation satellite systems

4. FLIGHT INSTRUCTION

The flying exercises should cover the revision and/or explanation of the following exercises:

Exercise 1: Familiarisation with the touring motor glider

- characteristics of the touring motor glider
- cockpit layout
- systems
- check lists, drills, controls

Exercise 1E: Emergency drills

- action in the event of fire on the ground and in the air
- engine cabin and electrical system fire
- systems failure
- escape drills, location and use of emergency equipment and exits

Exercise 2: Preparation for and action after flight

- serviceability documents
- equipment required, maps, etc.
- external checks
- internal checks
- harness, seat or rudder panel adjustments
- starting and warm up checks
- power checks
- running down system checks and switching off the engine
- parking, security and picketing (e.g. tie down)
- completion of authorisation sheet and serviceability documents

Exercise 3: Taxiing

- pre-taxi checks
- starting, control of speed and stopping
- engine handling
- control of direction and turning
- turning in confined spaces
- parking area procedure and precautions
- effects of wind and use of flying controls
- effects of ground surface

- freedom of rudder movement
- marshalling signals
- instrument checks
- air traffic control procedures **(if applicable)**

Exercise 3E: Emergencies

- Brake and steering failure

Exercise 4: Straight and level

- at normal cruising power, attaining and maintaining straight and level flight
- flight at critically high airspeeds
- demonstration of inherent stability
- control in pitch, including use of trim
- lateral level, direction and balance, trim
- at selected airspeeds (use of power)
- during speed and configuration changes
- use of instruments for precision
- ~~airmanship~~

Exercise 5: Climbing

- entry, maintaining the normal and max rate climb, levelling off
- levelling off at selected altitudes
- en-route climb (cruise climb)
- climbing with flap down
- recovery to normal climb
- maximum angle of climb
- use of instruments for precision
- airmanship

Exercise 6: Descending

- entry, maintaining and levelling off
- levelling off at selected altitudes
- glide, powered and cruise descent (including effect of power and airspeed)
- side slipping (o**n**~~r~~ suitable types)
- use of instruments for precision flight
- airmanship

Exercise 7: Turning

- entry and maintaining medium level turns
- resuming straight flight

- faults in the turn — (in correct pitch, bank, balance)
- climbing turns
- descending turns
- slipping turns (or suitable types)
- turns onto selected headings, use of gyro heading indicator **or**~~and~~ compass
- use of instruments for precision

Exercise 8A: Slow flight

NOTE: The objective is to improve the pilot's ability to recognise inadvertent flight at critically low speeds and provide practice in maintaining the touring motor glider in balance while returning to normal airspeed.

- safety checks
- introduction to slow flight
- controlled flight down to critically slow airspeed
- application of full power with correct attitude and balance to achieve normal climb speed
- airmanship

Exercise 8B: Stalling

- airmanship
- safety checks
- symptoms
- recognition
- clean stall and recovery without power and with power
- recovery when a wing drops
- approach to stall in the approach and in the landing configurations, with and without power, recovery at the incipient stage

Exercise 9: Take-off and climb to downwind position

- pre-take-off checks
- into wind take-off
- safeguarding the nosewheel (if applicable)
- crosswind take-off
- drills during and after take-off
- short take-off and soft field procedure/techniques including performance calculations
- noise abatement procedures
- airmanship

Exercise 10: Circuit, approach and landing

- circuit procedures, downwind, base leg
- powered approach and landing
- safeguarding the nosewheel (if applicable)
- effect of wind on approach and touchdown speeds~~, use of flaps~~
- **use of airbrakes, flaps, slats or spoilers**
- crosswind approach and landing
- glide approach and landing **(engine stopped)**
- short landing and soft field procedures/techniques
- flapless approach and landing **(if applicable)**
- wheel landing (tail wheel aeroplanes)
- missed approach/go around
- noise abatement procedures
- airmanship

Exercise 9/10E: Emergencies

- abandoned take-off
- engine failure after take-off
- mislanding /go-around
- missed approach

In the interests of safety it will be necessary for pilots trained on nosewheel touring motor gliders to undergo dual conversion training before flying tail wheel touring motor gliders, and vice –versa.

Exercise 11: Advanced turning

- steep turns (45°), level and descending
- stalling in the turn and recovery
- recoveries from unusual attitudes, including spiral dives
- airmanship

Exercise 12: Stopping and re–starting the engine

- **engine cooling procedures**
- **switching off procedure in flight**
- **sailplane operating procedures**
- **re–starting procedure**

Exercise 1**3**~~2~~: Forced landing without power

- forced landing procedure
- choice of landing area, provision for change of plan
- gliding distance
- descent plan
- key positions

- ~~engine cooling~~
- engine failure checks
- use of radio
- base leg
- final approach
- landing
- actions after landing
- ~~airmanship~~

Exercise 1**4**~~3~~: Precautionary landing

- full procedure away from aerodrome to break-off height
- occasions necessitating
- in-flight conditions
- landing area selection
  - normal aerodrome
  - disused aerodrome
  - ordinary field
- circuit and approach
- actions after landing
- ~~airmanship~~

Exercise ~~14A~~**15A**: Navigation

Flight planning

- weather forecast and actuals
- map selection and preparation
  - choice of route
  - airspace structure
  - safety altitudes
- calculations
  - magnetic heading(s) and time(s) en-route
  - fuel consumption
  - mass and balance
  - mass and performance
- flight information
  - NOTAMS etc.
  - radio frequencies
  - selection of alternate aerodromes
- touring motor glider documentation

- notification of the flight
  - pre-flight administrative procedures
  - flight plan form

Departure

- organisation of cockpit workload
- departure procedures
  - altimeter settings
  - ATC liaison in regulated airspace
  - setting heading procedure
  - noting of ETAs

En-route

- maintenance of altitude and heading
- revisions of ETA and heading
- log keeping
- use of radio**/compliance with ATC procedures**
- minimum weather conditions for continuation of flight
- in-flight decisions
- transiting controlled/regulated airspace
- diversion procedures
- uncertainty of position procedure
- lost procedure

Arrival, aerodrome joining procedure

  - ATC liaison in regulated airspace
  - altimeter setting
  - entering the traffic pattern
  - circuit procedures

- parking
- security of touring motor glider
- refuelling
- closing of flight plan, if appropriate
- post-flight administrative procedures

Exercise 1**5**4B: Navigation problems at lower levels and in reduced visibility

- actions prior to descending
- hazards (e.g. obstacles, and terrain)
- difficulties of map reading

- effects of wind and turbulence
- vertical situational awareness (avoidance of controlled flight into terrain)
- avoidance of noise sensitive areas
- joining the circuit
- bad weather circuit and landing

Exercise 1**5**~~4~~C: Radio navigation (basics)

Use of Global Navigation Satellite Systems **or VOR/NDB**

- Selection of waypoints
- to/from indications, orientation
- error messages

Use of VHF direction finding (VHF/DF)

- availability, AIP, frequencies
- R/T procedures and ATC liaison
- obtaining a QDM and homing

Use of en-route/terminal radar

- availability, AIP
- procedures and ATC liaison
- pilot’s responsibilities
- secondary surveillance radar
  - transponders
  - code selection
  - interrogation and reply

AMC No 1 to FCL.110.B and to FCL.210.B

FLIGHT INSTRUCTION FOR THE LIGH AIRCRAFT ~~EISURE~~ PILOT LICENCE — BALLOON
FLIGHT INSTRUCTION FOR THE BALLOON PILOT LICENCE (BPL)

1. ENTRY TO TRAINING

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

2. FLIGHT INSTRUCTION

2.1 The L**A**PL(B) / BPL flight instruction syllabus should take into account the principles of threat and error management and also cover:

(a) pre-flight operations, including load calculations, balloon inspection and servicing;

(b) crew and passenger briefings;

(c) inflation and crowd control;

(d) control of the balloon by external visual reference;

(e) take off in different wind conditions;

(f) approach from low and high level**;**~~:~~

(g) landings in **different** surface wind **conditions**~~s below and above 8 knots~~;

(h) cross-country flying using visual reference and dead reckoning;

~~(i) tethered flight (Hot air balloons only);~~

(**i**~~j~~) emergency operations, including simulated balloon equipment malfunctions;

(**j**~~k~~) compliance with air traffic services procedures and communication procedures**;**

(**k**~~l~~) **avoidance of nature protection areas,** landowner relations**;**

2.2 Before allowing the applicant for a BPL / L**A**PL(B) to undertake his/her first solo flight, the flight instructor should ensure that the applicant can operate the required systems and equipment.

3. SYLLABUS OF FLIGHT INSTRUCTION (HOT AIR BALLOON)

3.1. The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore the demonstrations and practices need not necessarily be given in the order listed. The actual order and content will depend upon the following interrelated factors:

- The applicant's progress and ability
- The weather conditions affecting the flight
- The flight time available
- Instructional technique considerations
- The local operating environment
- Applicability of the exercises to the balloon type

3.2. Each of the exercises involves the need for the pilot-under-training to be aware the needs of good airmanship and look-out, which should be emphasised at all times.

Exercise 1: Familiarisation with the balloon

- characteristics of the balloon
- the components / systems
- **re-fuelling of the cylinders**
- instruments and equipment
- use of check list(s) and procedures

Exercise 2: Preparation for flight

- documentation and equipment

- weather forecast and actuals
- flight Planning
  - Notam
  - Airspace structure
  - Sensitive areas **(e.g. nature protection areas)**
  - Expected track and distance
  - Pre-flight picture
  - Possible landing fields
- launch Field
  - Permission
  - Field selection
  - Behaviour
  - Adjacent Fields
- load Calculations

Exercise 3: Crew and Passenger Briefing

- clothing
- crew Briefing
- passenger Briefing

Exercise 4: Assembly and layout

- crowd control
- rigging envelope, basket and burner
- burner Test
- **use of restraint line**
- pre-inflation checks

Exercise 5: Inflation

- crowd control
- cold inflation
- **use of the inflation fan**
  - ~~Use of restraint line~~
  - ~~Use of the inflation fan~~
- hot inflation

Exercise 6: Take off in **different** wind **conditions**~~less than 8 knots~~

- pre take-off checks and briefings
- heating for controlled climb
- "Hands off / Hands on" procedure for ground crew
- **assessment of lift**

- use of quick release
- assessment of wind and obstacles
- **take-off in wind without shelter obstacles**
- **preparation for false lift**

~~Exercise 7: Take off in wind without shelter~~

~~pre take-off checks and briefings~~

~~heating for controlled climb~~

~~"Hands off / Hands on" procedure for ground crew~~

~~use of quick release~~

~~assessment of wind and obstacles~~

~~Exercise 8: Take off in wind more than 8 knots~~

~~pre take-off checks and briefings~~

~~heating for controlled climb~~

~~"Hands off / Hands on" procedure for ground crew~~

- ~~preparation for false lift~~
- ~~use of quick release~~
- ~~assessment of wind and obstacles~~

Exercise **7**~~9~~: Climb to level flight

- climbing with a predetermined rate of climb
- look out procedures
- effect on envelope temperature
- maximum rate of climb according to manufacturer's flight manual
- levelling off at selected altitude

Exercise **8**~~10~~: Level flight

- maintaining level flight by
  - Use of instruments only
  - Use of visual references only
  - All available means
- use of parachute and turning vents (if applicable)

Exercise ~~11~~**9**: Descent to level flight

descent with a predetermined rate of descent

- fast descent
- look out procedures
- maximum rate of descent according to manufacturer's flight manual
- use of parachute

- parachute stall
- cold descent
- levelling off at selected altitude

Exercise 1~~2~~**0**: Emergencies - systems

- pilot light failure
- burner failure, valve leaks, flame out, re-light
- gas leaks
- envelope over temperature
- envelope damage in flight
- parachute/Rapid deflation system failure

Exercise 1**0B**~~3~~: Other emergencies

- fire extinguishers
- fire on ground
- fire in the air
- contact with electrical power lines
- obstacle avoidance
- escape drills, location and use of emergency equipment

Exercise 1**1**~~4~~: Navigation

- maps selection
- plotting expected track
- marking positions and time
- calculation of distance, speed and fuel consumption
- ceiling limitations (ATC, Weather, Envelope temperature)
- planning ahead
- monitoring of weather development and acting accordingly
- monitoring of fuel consumption and envelope temperature
- ATC liaison (if applicable)
- communication with retrieve crew
- use of GPS (if applicable)

Exercise 1**2**~~5~~: Fuel Management

- cylinder arrangement and burner systems
- pilot light supply (vapour/liquid)
- use of master cylinders (if applicable)
- fuel requirement and expected fuel consumption
- fuel state and pressure
- fuel reserves

- cylinder contents gauge and change procedure
- use of cylinder manifolds

Exercise 1**3**~~6~~: Approach from low level

- pre landing checks
- **passenger pre-landing briefing**
- selection of field
- use of burner and parachute
- look out procedures
- missed approach / fly on

Exercise 1**4**~~7~~: Approach from high level

- pre landing checks
- **passenger pre-landing briefing**
- selection of field
- rate of descent
- use of burner and parachute
- look out procedures
- missed approach / fly on

Exercise 1**5**~~8~~: Operating at low level

- use of burner**, whisper burner** and parachute
- look out procedures
- avoidance of low level obstacles
- **avoidance of protection areas**
- landowner relations

Exercise 1**6**~~9~~: Landing in **different** wind **conditions**~~less than 8 knots~~

- pre landing checks
- **passenger pre-landing briefing**
- selection of field
- **turbulences (in the case of landings with high wind speed only)**
- use of burner and pilot lights
- use of parachute and turning vents (if applicable)
- look out **procedures**
- dragging and Deflation
- landowner relations
- airmanshi**p**~~p~~
- ~~Exercise 20: Landing in wind more than 8 knots~~

~~– pre landing checks~~

~~– selection of field~~

~~– turbulence~~

~~– use of burner and pilot lights~~

~~– use of parachute and turning vents (if applicable)~~

~~– look out procedures~~

~~– dragging and Deflation~~

~~– landowner relations~~

~~Exercise 21: Tethered flight~~

~~– ground preparations~~

~~– weather suitability~~

~~– tether points~~

~~– Upwind~~

~~– Downwind~~

~~– tether ropes~~

~~– maximum all-up-weight limitation~~

~~– crowd control~~

~~– pre take-off checks and briefings~~

~~– heating for controlled lift off~~

~~– "Hands off / Hands on" procedure for ground crew~~

– ~~assessment of wind and obstacles~~

Exercise ~~22~~**17**: First Solo

– supervised flight preparation

– instructor's briefing, observation of flight and de-briefing

4. SYLLABUS OF FLIGHT INSTRUCTION (GAS BALLOON)

4.1. The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore the demonstrations and practices need not necessarily be given in the order listed. The actual order and content will depend upon the following interrelated factors:

– The applicant's progress and ability

– The weather conditions affecting the flight

– The flight time available

– Instructional technique considerations

– The local operating environment

– Applicability of the exercises to the balloon type

4.2. Each of the exercises involves the need for the pilot-under-training to be aware the needs of good airmanship and look-out, which should be emphasised at all times.

Exercise 1: Familiarisation with the balloon

- characteristics of the balloon
- the components / systems
- instruments and equipment
- use of check list(s) and procedures

Exercise 2: Preparation for flight

- documentation and Equipment
- weather forecast and actuals
- flight Planning
  - Notam
  - Airspace structure
  - Sensitive areas **(e.g. nature protection areas)**
  - Expected track and distance
  - Pre-flight picture
  - Possible landing fields
- launch Field
  - Permission
  - Behaviour
  - Adjacent Fields
- load Calculations

Exercise 3: Crew and Passenger Briefing

- clothing
- crew Briefings
- passenger Briefing

Exercise 4 :Assembly and layout

- crowd control
- rigging envelope and basket (Balloon with net)
- rigging envelope and basket (Net–less balloon)
- ballast check

Exercise 5: Inflation

- crowd control
- inflation procedure according to manufacturer’s flight manual
- avoiding electrostatic discharge

Exercise 6: Take off in different wind conditions

- **pre take-off checks and briefings**
- **prepare for controlled climb**
- **"Hands off / Hands on" procedure for ground crew**
- **assessment of wind and obstacles**

preparation for false lift~~Exercise 6: Take off in wind less than 8 knots~~

- ~~pre take-off checks and briefings~~
- ~~prepare for controlled climb~~
- ~~"Hands off / Hands on" procedure for ground crew~~
- ~~assessment of wind and obstacles~~

~~Exercise 7: Take off in wind more than 8 knots~~

- ~~pre take-off checks and briefings~~
- ~~preparation for controlled climb~~
- ~~"Hands off / Hands on" procedure for ground crew~~
- ~~preparation for false lift~~
- ~~assessment of wind and obstacles~~

Exercise **7**~~8~~: Climb to level flight

- climb with a predetermined rate of climb
- look out procedures
- maximum rate of climb according to manufacturer's flight manual
- levelling off at selected altitude

Exercise **8**~~9~~: Level flight

- maintaining level flight by
  - Use of instruments only
  - Use of visual references only
  - All available means
- use of parachute/valve

Exercise **9**~~10~~: Descent to level flight

- descent with a predetermined rate of descent
- fast descent
- look out procedures
- maximum rate of descent according to manufacturer's flight manual
- use of parachute/valve
- levelling off at selected altitude

Exercise 1**0**~~1~~ :Emergencies

- closed appendix during take-off and climb
- envelope damage in flight
- parachute/valve failure
- contact with electrical power lines
- obstacle avoidance
- escape drills, location and use of emergency equipment

Exercise 1**1**~~2~~: Navigation

- map selection
- plotting expected track
- marking positions and time
- calculation of distance, speed and ballast consumption
- ceiling limitations (ATC, Weather, Ballast)
- planning ahead
- monitoring of weather development and acting accordingly
- monitoring of ballast consumption
- ATC liaison (if applicable)
- communication with retrieve crew
- use of GPS (if applicable)

Exercise 1**2**~~3~~: Ballast Management

- minimum ballast
- arrangement and securing of ballast
- ballast requirement and expected ballast consumption
- ballast reserves

Exercise 1**3**~~4~~: Approach from low level

- pre landing checks
- **passenger pre-landing checks**
- selection of field
- use of ballast and parachute/valve
- use of trail rope (if applicable)
- look out procedures
- missed approach / fly on

Exercise 1**4**~~5~~: Approach from high level

- pre landing checks
- **passenger pre-landing checks**
- selection of field
- rate of descent

- use of ballast and parachute/valve
- use of trail rope (if applicable)
- look out procedures
- missed approach / fly on

Exercise 1**5**~~6~~: Operating at low level

- use of ballast and parachute/valve
- look out procedures
- avoidance of low level obstacle~~s~~
- **avoidance of protection areas**
- landowner relations

Exercise 1**6**~~7~~: Landing in **different** wind **conditions**~~less than 8 knots~~

- pre landing checks
- **passenger pre-landing briefing**
- selection of field
- **turbulences (in the case of landings with high wind speed only)**
- use of ballast and parachute/valve
- look out procedures
- use of rip panel
- **dragging**
- deflation
- avoiding electrostatic discharge
- landowner relations

~~Exercise 18: Landing in wind more than 8 knots~~

~~–pre landing checks~~

~~–selection of field~~

~~–turbulence~~

~~–use of ballast and parachute/valve~~

~~–look out~~

~~–use of rip panel~~

~~–dragging~~

~~–deflation~~

~~–avoiding electrostatic discharge~~

- ~~landowner relations~~

Exercise 1**7**~~9~~: First Solo

NOTE: The exercises 1––16 have to be completed and the student must have achieved a safe and competent level before the first solo flight takes place.

- supervised flight preparation
- instructor's briefing, observation of flight and de-briefing

AMC No 2 to FCL.110.B and to FCL.210.B

CREDITING —— PRE-ENTRY FLIGHT TEST
The pre-entry flight test referred to in paragraph (b) or in the case of the BPL in paragraph (c) should cover the total content of the syllabus of flight instruction for the issuance of the LAPL(B) or BPL, in accordance with AMC No 1 to FCL.110.B and to FCL.210.S.

AMC to FCL.130.B and to FCL.220.B

FLIGHT INSTRUCTION FOR THE EXTENSION OF PRIVILIEGES TO TETHERED FLIGHTS

1. **The aim of the flight instruction is to qualify LAPL(B) or BPL holders to perform tethered flights**
2. **The flying exercise should cover the following training items:**
   - **ground preparations**
   - **weather suitability**
   - **tether points**
     - **Upwind**
     - **Downwind**
   - **tether ropes (three point system)**
   - **maximum all-up-weight limitation**
   - **crowd control**
   - **pre take-off checks and briefings**
   - **heating for controlled lift off**
   - **"Hands off / Hands on" procedure for ground crew**
   - **assessment of lift**
   - **assessment of wind and obstacles**
   - **take-off and controlled climb (at least up to 60 feet – 20m)**

AMC No 1 to FCL.135.B and to FCL.225.B

~~FLIGHT INSTRUCTION (~~THEORETICAL KNOWLEDGE INSTRUCTION~~)~~ FOR THE EXTENSION TO ANOTHER BALLOON CLASS: LIGHT AIRCRAFT~~EISURE~~ PILOT LICENCE — BALLOON / BALLOON PILOT LICENCE (BPL)

1. The aim of the flight instruction is to qualify L**A**PL(B) or BPL holders to exercise the privileges on a different class of balloons.

2. The following classes are recognised:

   – hot air balloons
   – gas balloons
   – hot air airships

3. The approved training organisation should issue a certificate of satisfactory completion of the instruction for the purpose of licence endorsement.

4. THEORETICAL KNOWLEDGE

   The theoretical knowledge syllabus should cover the revision and/or explanation of:

   4.1 Principles of flight
   – operating limitations
   – loading limitations

   4.2 Operational Procedures
   – special operational procedures and hazards
   – emergency procedures

   4.3 Flight performance and planning
   – mass considerations
   – loading
   – performance (hot-air–/–gas–/–hot air airship)
   – flight planning
   – fuel planning
   – flight monitoring

   4.4 Aircraft general knowledge
   – system designs, loads, stresses, maintenance
   – envelope
   – burner (only extension to hot air balloon /airship)
   – fuel cylinders (except gas balloons)
   – basket / gondola
   – lifting or burning gas
   – ballast (only gas balloon)
   – engine (only hot-air airship)
   – instruments and indication systems
   – emergency equipment

AMC No 2 to FCL.135.B and to FCL.225.B

FLIGHT INSTRUCTION ~~(THEORETICAL KNOWLEDGE)~~ FOR THE EXTENSION TO ANOTHER BALLOON CLASS: LIGHT AIRCRAFT~~EISURE~~ PILOT LICENCE — BALLOON / BALLOON PILOT LICENCE (BPL)

ADDITIONAL SYLLABUS OF FLIGHT INSTRUCTION FOR THE EXTENSION OF PRIVILEGES FOR THE BALLOON PILOT LICENCE/L**IGHT AIRCRAFT**~~EISURE~~ PILOT LICENCE (BALLOONS) **—** HOT AIR BALLOON TO HOT-AIR AIRSHIP

The pre–requisite for the extension of privileges to hot-air airships is a valid BPL or L**A**PL for hot air balloons because a hot-air airship with a failed engine must be handled in a similar manner as a hot air balloon. The conversion training has to concentrate therefore on the added complication of the engine, its controls and the different operating limitations of a hot-air airship.

Exercise 1: Familiarisation with the hot air airship

- characteristics of the hot air airship
- the components / systems
- instruments and equipment
- use of check list(s) and procedures

Exercise 2: Preparation for flight

- documentation and equipment
- weather forecast and actuals
- flight Planning
  - N**OTAM**~~otam~~
  - Airspace structure
  - Sensitive areas
  - Expected track and distance
  - Pre-flight picture
  - Possible landing fields
- launch Field
  - Permission
  - Behaviour
  - Field selection
  - Adjacent Fields
- load and fuel calculations

Exercise 3: Crew and passenger briefing.

- clothing
- crew Briefing
- passenger Briefing

Exercise 4: Assembly and layout

- crowd control

- rigging envelope, gondola, burner and engine
- burner test
- pre-inflation checks

Exercise 5: Inflation

- crowd control
- cold inflation
  - Use of restraint line
  - Use of the inflation fan
- hot inflation

Exercise 6: Engine

- identification of main parts and controls
- familiarisation with operation and checking of the engine
- engine checks before take off

Exercise 7: Pressurisation

- pressurisation fan operation
- super pressure and balance between pressure and temperature
- pressure limitations

Exercise 8: Take off

- pre take-off checks and briefings
- heating for controlled climb
- procedure for ground crew
- assessment of wind and obstacles

Exercise 9: Climb to level flight.

- climbing with a predetermined rate of climb
- effect on envelope temperature and pressure
- maximum rate of climb according to manufacturer's flight manual
- level off at selected altitude

Exercise 10: Level flight.

- maintaining level flight by
  - Use of instruments only
  - Use of visual references only
  - All available means
- maintaining level flight at different airspeeds taking account of aerodynamic lift

Exercise 11: Descent to level flight.

- descent with a predetermined rate of descent

- maximum rate of descent according to manufacturer’s flight manual
- levelling off at selected altitude

Exercise 12: Emergencies –— systems.

- engine failure
- pressurisation failure
- rudder failure
- pilot light failure
- burner failure, valve leaks, flame out, re-light
- gas leaks
- envelope over temperature
- envelope damage in flight

Exercise 1**2B**~~3~~: Other emergencies

- fire extinguishers
- fire on ground
- fire in the air
- contact with electrical power lines
- obstacle avoidance
- escape drills, location and use of emergency equipment

Exercise 1**3**~~4~~: Navigation

- map selection and preparation
- plotting and steering expected track
- marking positions and time
- calculation of distance, speed and fuel consumption
- ceiling limitations (ATC, Weather, Envelope temperature)
- planning ahead
- monitoring of weather development and acting accordingly
- monitoring of fuel and envelope temperature / pressure
- ATC liaison (if applicable)
- communication with ground crew
- use of GPS (if applicable)

Exercise 1**4**~~5~~: Fuel Management

- engine arrangement and tank system.
- cylinder arrangement and burner systems
- pilot light supply (vapour/liquid)

- fuel requirement and expected fuel consumption for engine and burner
- fuel state and pressure
- fuel reserves
- cylinder and petrol tank contents gauge

Exercise 1**5**~~6~~: Approach and go around.

- pre landing checks
- selection of field into wind
- use of burner and engine
- look out procedures
- missed approach / go around

Exercise 1**6**~~7~~: Approach with simulated engine failure.

- pre landing checks
- selection of field
- use of burner
- look out procedures
- missed approach / go around

Exercise 1**7**~~8~~: Operating at low level

- use of burner and engine
- look out procedures
- avoidance of low level obstacles
- **avoidance of sensitive areas (nature protection areas) /** landowner relations

Exercise 1**8**~~9~~: Steering

- assessment of wind
- correcting for wind to steer a given course

Exercise **19**~~20~~: Final landing

- pre landing checks
- use of burner and engine
- look out
- deflation
- land owner relations

AMC No 3 to FCL.135.B and FCL.225.B

Contents of the skill test for the extension of an LAPL(B) or a BPL to another balloon class (hot air airship)

1. The take off site should be chosen by the applicant depending on the actual meteorological conditions, the area which has to be overflown and the possible options for suitable landing sites. The applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board.
2. An applicant should indicate to the FE the checks and duties carried out. Checks should be completed in accordance with the flight manual and/or the authorised check list for the balloon on which the test is being taken. During pre-flight preparation for the test the applicant should be required to perform crew and passenger briefings and demonstrate crowd control. The load calculation should be performed by the applicant in compliance with the operations manual or flight manual for the hot air airship used.

FLIGHT TEST TOLERANCE

3. The applicant should demonstrate the ability to:
   - operate the hot air airship within its limitations;
   - complete all manoeuvres with smoothness and accuracy
   - exercise good judgment and airmanship;
   - apply aeronautical knowledge; and
   - maintain control of the airship at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.
4. The skill test contents and sections set out in this AMC should be used for the skill test for the issue of a**n** L**A**PL(B) and BPL Hot Air Airship extension.

SECTION 1 — PRE-FLIGHT OPERATIONS, INFLATION AND TAKE-OFF	
Use of checklist, airmanship, control of hot-air airship by external visual reference, look out procedures, etc. apply in all sections	
a	Pre-flight documentation, flight planning**, NOTAM** –and weather brief
b	Hot-air airship inspection and servicing
c	Load calculation
d	Crowd control, crew and passenger briefings
e	Assembly and layout
f	Inflation and pre-take-off procedures
g	Take**-**off
h	ATC liaison **—** compliance (if applicable)

SECTION 2 — GENERAL AIRWORK	
a	Climb to level flight
b	Level flight
c	Descent to level flight
d	Operating at low level
e	ATC liaison — compliance (if applicable)
SECTION 3 — EN-ROUTE PROCEDURES	
a	Dead reckoning and map reading
b	Marking positions and time
c	Orientation, airspace structure
d	Plotting and steering expected track
e	Maintenance of altitude
f	Fuel management
g	Communication with ground crew
h	ATC liaison –— compliance (if applicable)
SECTION 4 APPROACH AND LANDING PROCEDURES	
a	Approach, missed approach / go around
b	Pre-–landing checks
c	Selection of landing field
d	Landing and deflation
e	ATC liaison — compliance (if applicable)
f	Actions after flight
SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES	
This section may be combined with Sections 1 through 4.	
a	Simulated Fire on the ground and in the air
b	Simulated pilot light-, burner- and engine-failure
c	Approach with simulated engine failure, missed approach / go around
d	Other abnormal and emergency procedures as outlined in the appropriate flight manual
e	Oral questions

SUBPART C

PRIVATE PILOT LICENCE (PPL), SAILPLANE PILOT LICENCE (SPL) and BALLOON PILOT LICENCE (BPL)

AMC No 1 to FCL.210 and FCL.215

Syllabus of theoretical knowledge for the private pilot licence – aeroplanes and helicopters

The following tables contain the syllabi for the courses of theoretical knowledge, as well as for the theoretical knowledge examinations for the PPL(A) and (H). The training and examination should cover aspects related to non-technical skills in an integrated manner, taking into account the particular risks associated to the licence and the activity. **An approved course shall comprise at least 100 hours of theoretical knowledge instruction. This theoretical knowledge instruction provided by the approved training organisation should include a certain element of formal classroom work but may include also such facilities as interactive video, slide/tape presentation, computer based training and other media distance learning courses. The training organisation responsible for the training has to check if all the appropriate elements of the training course of theoretical knowledge instruction have been completed to a satisfactory standard before recommending the applicant for the examination.**

		Aeroplane		Helicopter	
		PPL	**Bridge**	**PPL**	**Bridge**
010 00 00 00	**AIR LAW AND ATC PROCEDURES**				
010 01 00 00	**INTERNATIONAL LAW: CONVENTIONS, AGREEMENTS AND ORGANISATIONS**				
010 01 01 00	**The Convention on international civil aviation (Chicago) Doc. 7300/6**				
010 01 01 01	Part I Air Navigation – relevant parts of the following chapters: – general principles and application of the convention – flight over territory of Contracting States – nationality of aircraft – measures to facilitate air navigation – conditions to be fulfilled with respect to aircraft – international standards and recommended practices – validity of endorsed certificates and licences – notification of differences	x	~~x~~	x	~~x~~

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
010 01 01 02	Part II The International Civil Aviation Organisation (ICAO) – objectives and composition	x	~~x~~	x	~~x~~
010 02 00 00	**ANNEX 8 – AIRWORTHINESS OF AIRCRAFT**				
010 02 01 00	– foreword, definitions	x	~~x~~	x	~~x~~
010 02 02 00	– certificate of airworthiness	x	~~x~~	x	~~x~~
010 03 00 00	**ANNEX 7 – AIRCRAFT NATIONALITY AND REGISTRATION MARKS**				
010 03 01 00	– Foreword, definitions	x	~~x~~	x	~~x~~
010 03 02 00	– Common- and registration marks	x	~~x~~	x	~~x~~
010 03 03 00	– Certificate of registration, Aircraft nationality	x	~~x~~	x	~~x~~
010 04 00 00	**ANNEX 1 – PERSONNEL LICENSING**				
010 04 01 00	– Definitions	x	~~x~~	x	~~x~~
010 04 02 00	– Relevant parts of Annex 1 connected to Part FCL and Part Medical	x	~~x~~	x	~~x~~
010 05 00 00	**ANNEX 2 - RULES OF THE AIR**				
010 05 01 00	– essential definitions, applicability of the rules of the air, general rules (except water operations), visual flight rules, signals, interception of civil aircraft.	x	~~x~~	x	~~x~~
010 06 00 00	**PROCEDURES FOR AIR NAVIGATION – AIRCRAFT OPERATIONS Doc. 8168-OPS/611, VOLUME 1**				
010 06 06 00	**Altimeter setting procedures (including ICAO Doc. 7030 – regional supplementary procedures)**				
010 06 06 01	– Basic requirements (except tables), procedures applicable to operators and pilots (except tables)	x	~~x~~	x	~~x~~
010 06 07 00	**Secondary surveillance radar transponder operating procedures (including ICAO Doc. 7030 – regional supplementary procedures)**				
010 06 07 01	– operation of transponders	x	~~x~~	x	~~x~~
010 06 07 03	– phraseology	x	~~x~~	x	~~x~~
010 07 00 00	**ANNEX 11, Doc. 4444 AIR TRAFFIC MANAGEMENT**				
010 07 01 00	Definitions	x	~~x~~	x	~~x~~
010 07 04 00	General provisions for air traffic services	x	~~x~~	x	~~x~~
010 07 06 00	Visual separation in the vicinity of aerodromes.	x	~~x~~	x	~~x~~

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
010 07 07 00	Procedures for aerodrome control services	x	~~x~~	x	~~x~~
010 07 08 00	Radar services	x	~~x~~	x	~~x~~
010 07 09 00	Flight information service and alerting service	x	~~x~~	x	~~x~~
010 07 12 00	Phraseologies	x	~~x~~	x	~~x~~
010 07 15 00	Procedures related to emergencies, communication failure and contingencies	x	~~x~~	x	~~x~~
010 08 00 00	**ANNEX 15 - AERONAUTICAL INFORMATION SERVICE**				
010 08 01 00	Introduction, essential definitions	x	~~x~~	x	~~x~~
010 08 02 00	AIP, NOTAM, AIRAC, AIC	x	~~x~~	x	~~x~~
010 09 00 00	**ANNEX 14, Vol 1 & 2 - AERODROMES**				
010 09 01 00	Essential definitions	x	~~x~~	x	~~x~~
010 09 02 00	Aerodrome data: – conditions of the movement area and related facilities	x	~~x~~	x	~~x~~
010 09 03 00	Visual aids for navigation – indicators and signalling devices – markings – lights – signs – markers	x	~~x~~	x	~~x~~
010 09 04 00	Visual aids for denoting obstacles – marking of objects – lighting of objects	x	~~x~~	x	~~x~~
010 09 05 00	Visual aids for denoting restricted use of areas	x	~~x~~	x	~~x~~
010 09 06 00	Emergency and other services – rescue and fire fighting – apron management service	x	~~x~~	x	~~x~~
010 11 00 00	**ANNEX 12 - SEARCH AND RESCUE**				
010 11 01 00	Essential definitions	x	~~x~~	x	~~x~~
010 11 04 00	Operating procedures – procedures for pilots-in-command at the scene of an accident – procedures for pilots-in-command intercepting a distress transmission – search and rescue signals	x	~~x~~	x	~~x~~
010 11 05 00	Search and rescue signals: – signals with surface craft – ground/air visual signal code – air/ground signals	x	~~x~~	x	~~x~~
010 12 00 00	**ANNEX 17 - SECURITY**				

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
010 12 01 00	General: aims and objectives	x	~~x~~	x	~~x~~
010 13 00 00	**ANNEX 13 - AIRCRAFT ACCIDENT INVESTIGATION**				
010 13 01 00 010 13 02 00	Essential definitions Applicability	x x	~~x~~ ~~x~~	x x	~~x~~ ~~x~~
010 15 00 00	**NATIONAL LAW**				
010 15 01 00	National law and differences to relevant ICAO Annexes, JARs and EASA regulations.	x	~~x~~	x	~~x~~

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
021 00 00 00	**AIRCRAFT GENERAL KNOWLEDGE – AIRFRAME AND SYSTEMS, ELECTRICS, POWERPLANT, EMERGENCY EQUIPMENT**				
021 01 00 00	**SYSTEM DESIGN, LOADS, STRESSES, MAINTENANCE**				
021 01 02 00	**Loads and combination loadings applied to an aircraft's structure**	x	x	x	x
021 02 00 00	**AIRFRAME**				
021 02 03 00	**Wings, tail surfaces and control surfaces**				
021 02 03 01	Design and constructions	x	x		
021 02 03 02	Structural components and materials	x	x		
021 02 03 03	Stresses	x	x		
021 02 03 04	Structural limitations	x	x		
021 02 04 00	**Fuselage, doors, floor, wind-screen and windows**				
021 02 04 01	Design and constructions	x	x	x	x
021 02 04 02	Structural components and materials	x	x	x	x
021 02 04 03	Stresses	x	x	x	x
021 02 04 04	Structural limitations	x	x	x	x
021 02 05 00	**Flight and control surfaces**				
021 02 05 01	Design and constructions			x	x
021 02 05 02	Structural components and materials			x	x
021 02 05 03	Stresses, aeroelastic vibrations			x	x
021 02 05 04	Structural limitations			x	x

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
021 03 00 00	**HYDRAULICS**				
021 03 01 00	**Hydromechanics: basic principles**	x	x	x	x
021 03 02 00	**Hydraulic systems**	x	x	x	x
021 03 02 01	Hydraulic fluids: types, characteristics, limitations	x	x	x	x
021 03 02 02	System components: design, operation, degraded modes of operation, indications and warnings	x	x	x	x
021 04 00 00	**LANDING GEAR, WHEELS, TYRES, BRAKES**				
021 04 01 00	**Landing gear**				
021 04 01 01	Types and materials	x	x	x	x
021 04 02 00	**Nose wheel steering: design, operation**	x	x		
021 04 03 00	**Brakes**				
021 04 03 01	Types and materials	x	x	x	x
021 04 03 02	System components, design, operation, indications and warnings	x	x	x	x
021 04 04 00	**Wheels and Tyres**				
021 04 04 01	Types, operational limitations	x	x	x	x
021 04 05 00	**Helicopter equipments**			x	x
021 05 00 00	**FLIGHT CONTROLS**				
021 05 01 00	**Flight Controls**				
021 05 01 01	Mechanical/powered	x	x	x	x
021 05 01 03	Control systems, mechanical	x	x	x	x
021 05 01 04	System components, design, operation, indications and warnings, degraded modes of operation, jamming	x	x	x	x
021 05 02 00	**Secondary Flight Controls**				
021 05 02 01	System components, design, operation, degraded modes of operation, indications and warnings	x	x		
021 07 00 00	**ANTI-ICING SYSTEMS**				
021 07 01 00	Types, operation (pitot, windshield)	x	x	x	x
021 08 00 00	**FUEL SYSTEM**				
021 08 01 00	**Piston engine**				
021 08 01 01	Design, operation, system components, degraded modes of operation, indications and warnings	x	x	x	x

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
021 08 02 00	**Turbine engine**				
021 08 02 00	Design, operation, system components, degraded modes of operation, indications and warnings			x	x
021 09 00 00	**ELECTRICS**				
021 09 01 00	**Electrics: general, definitions**				
021 09 01 01	Direct Current: - voltage, current, resistance, conductivity, Ohm's law, power, work	x	x	x	x
021 09 01 02	Alternating Current: - voltage, current, amplitude, phase, frequency, resistance	x	x	x	x
021 09 01 04	Circuits: series, parallel	x	x	x	x
021 09 01 05	Magnetic field: effects in an electrical circuit	x	x	x	x
021 09 02 00	**Batteries**				
021 09 02 01	Types, characteristics and limitations	x	x	x	x
021 09 02 02	Battery chargers, characteristics and limitations	x	x	x	x
021 09 03 00	**Static electricity: general**				
021 09 03 01	Basic principles	x	x	x	x
021 09 03 02	Static dischargers	x	x	x	x
021 09 03 03	Protection against interference	x	x	x	x
021 09 03 04	Lightning effects	x	x	x	x
021 09 04 00	**Generation: production, distribution, use**				
021 09 04 01	DC Generation: - types, design, operation, degraded modes of operation, indications and warnings	x	x	x	x
021 09 04 02	AC Generation: - types, design, operation, degraded modes of operation, indications and warnings	x	x	x	x
021 09 05 00	**Electric components**				
021 09 05 01	Basic elements: - basic principles of switches, circuit-breakers, relays	x	x	x	x
021 09 06 00	**Distribution**				

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
021 09 06 01	General: - bus bar, common earth, priority - AC and DC comparison	x	x	x	x
021 10 00 00	**PISTON ENGINES**				
021 10 01 00	**General**				
021 10 01 01	Types of internal combustion engine: basic principles, definitions	x	x	x	x
021 10 01 02	Engine: design, operation, components and materials	x	x	x	x
021 10 02 00	**Fuel**				
021 10 02 01	Types, grades, characteristics, limitations	x	x	x	x
021 10 02 02	Alternate fuel: characteristics, limitations	x	x	x	x
021 10 03 00	**Carburettor/Injection system**				
021 10 03 01	Carburettor: design, operation, degraded modes of operation, indications and warnings	x	x	x	x
021 10 03 02	Injection: design, operation, degraded modes of operation, indications and warnings	x	x	x	x
021 10 03 03	Icing	x	x	x	x
021 10 04 01	**Air cooling systems**				
021 10 04 01	Design, operation, degraded modes of operation, indications and warnings	x	x	x	x
021 10 05 00	**Lubrication systems**				
021 10 05 01	Lubricants: types, characteristics, limitations	x	x	x	x
021 10 05 02	Design, operation, degraded modes of operation, indications and warnings	x	x	x	x
021 10 06 01	**Ignition circuits**				
021 10 06 01	Design, operation, degraded modes of operation	x	x	x	x
021 10 07 01	**Mixture**				
021 10 07 01	Definition, characteristic mixtures, control instruments, associated control levers, indications	x	x	x	x
021 10 08 00	**Propellers**				
021 10 08 01	Definitions, general: - Aerodynamic parameters - Types - Operating modes	x	x		

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
021 10 08 02	Constant speed propeller: – Design, operation, system components	x	X		
021 10 08 04	Propeller handling: - Associated control levers, degraded modes of operation, indications and warnings	x	x		
021 10 09 00	**Performance and engine handling**				
021 10 09 01	Performance: influence of engine parameters, influence of atmospheric conditions, limitations, power augmentation systems	x	x	x	x
021 10 09 02	Engine handling: power and mixture settings during various flight phases, operational limitations	x	x	x	x
021 11 00 00	**TURBINE ENGINES**				
021 11 02 00	**Definitions**			x	x
021 11 02 01	Coupled turbine engine: design, operation, components and materials			x	x
021 11 02 02	Free turbine engine: design, operation, components and materials			x	x
021 11 03 00	**Fuel**				
021 11 03 01	Types, characteristics, limitations			x	x
021 11 04 00	**Main engine components**				
021 11 04 02	Compressor - Types, design, operation, components and materials - Stresses and limitations - Stall, surge, means of prevention			x	x
021 11 04 03	Combustion chamber - Types, design, operation, components and materials - Stresses and limitations - Emission problems			x	x
021 11 04 04	Turbine - Types, design, operation, components and materials - Stresses, creep and limitations			x	x
021 11 04 05	Exhaust - Design, operation, materials - Noise reduction			x	x

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
021 11 04 06	Fuel control units - Types, operation, sensors			x	x
021 11 04 07	Helicopter: Air intake - Different types, design, operation, materials, optional equipments			x	x
021 11 05 00	**Additional components and systems**				
021 11 05 02	Helicopter: Additional components and systems: - Lubrication system, ignition circuit, starter, accessory gearbox, free wheel units: design, operation, components			x	x
021 11 06 00	**Performance aspects**				
021 11 06 02	Torque, performance aspects, engine handling and limitations: - Engine ratings - Engine performance and limitations - Engine handling			x	x
021 12 00 00	**PROTECTION AND DETECTION SYSTEMS**				
021 12 03 00	**Fire detection systems**				
021 12 03 01	Operation, indications			x	X
021 14 00 00	**MISCELLANEOUS SYSTEMS**				
021 14 03 00	**Rotor design**			x	x
021 15 00 00	**ROTOR HEADS**				
021 15 01 00	**Main rotor**				
021 15 01 01	Types			x	x
021 15 01 02	Structural components and materials, stresses, structural limitations			x	x
021 15 01 03	Design and construction			x	x
021 15 01 04	Adjustment			x	x
021 15 02 00	**Tail rotor**				
021 15 02 01	Types			x	x
021 15 02 02	Structural components and materials, stresses, structural limitations			x	x
021 15 02 03	Design and construction			x	x
021 15 02 04	Adjustment			x	x
021 16 00 00	**TRANSMISSION**				

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
021 16 01 00	**Main gear box**				
021 16 01 01	Different types, design, operation, limitations			x	x
021 16 02 00	**Rotor brake**				
021 16 02 01	Different types, design, operation, limitations			x	x
021 16 03 00	**Auxiliary systems**			x	x
021 16 04 00	**Drive shaft and associated installation**			x	x
021 16 05 00	**Intermediate and tail gear box**				
021 16 05 01	Different types, design, operation, limitations			x	x
021 17 00 00	**BLADES**				
021 17 01 00	**Main rotor blade**				
021 17 01 01	Design, construction			x	x
021 17 01 02	Structural components and materials			x	x
021 17 01 03	Stresses			x	x
021 17 01 04	Structural limitations			x	x
021 17 01 05	Adjustment			x	x
021 17 01 06	Tip shape			x	x
021 17 02 00	**Tail rotor blade**				
021 17 02 01	Design, construction			x	x
021 17 02 02	Structural components and materials			x	x
021 17 02 03	Stresses			x	x
021 17 02 04	Structural limitations			x	x
021 17 02 05	Adjustment			x	x

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
022 00 00 00	**AIRCRAFT GENERAL KNOWLEDGE – INSTRUMENTATION**				
022 01 00 00	**INSTRUMENT AND INDICATION SYSTEMS**				
022 01 01 00	**Pressure gauge**				
022 01 01 01	Different types, design, operation, characteristics, accuracy	x	x	x	x
022 01 02 00	**Temperature sensing**				

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
022 01 02 01	Different types, design, operation, characteristics, accuracy	x	x	x	x
022 01 03 00	**Fuel gauge**				
022 01 03 01	Different types, design, operation, characteristics, accuracy	x	x	x	x
022 01 04 00	**Flow meter**				
022 01 04 01	Different types, design, operation, characteristics, accuracy	x	x	x	x
022 01 05 00	**Position transmitter**				
022 01 05 01	Different types, design, operation, characteristics, accuracy	x	x	x	x
022 01 06 00	**Torque meter**				
022 01 06 01	Design, operation, characteristics, accuracy			x	x
022 01 07 00	**Tachometer**				
022 01 07 01	Design, operation, characteristics, accuracy	x	x	x	x
022 02 00 00	**MEASUREMENT OF AERODYNAMIC PARAMETERS**				
022 02 01 00	**Pressure measurement**				
022 02 01 01	Static pressure, dynamic pressure, density: definitions	x	x	x	x
022 02 01 02	Design, operation, errors, accuracy	x	x	x	x
022 02 02 00	**Temperature measurement: Aeroplane**				
022 02 02 02	Design, operation, errors, accuracy	x	x		
022 02 02 03	Displays	x	x		
022 02 03 00	**Temperature measurement: Helicopter**			x	x
022 02 03 01	Design, operation, errors, accuracy			x	x
022 02 03 02	Displays			x	x
022 02 05 00	**Altimeter**				
022 02 05 01	Standard atmosphere	x	x	x	x
022 02 05 02	The different barometric references (QNH, QFE and 1013.25)	x	x	x	x
022 02 05 03	Height, indicated altitude, true altitude, pressure altitude and density altitude	x	x	x	x
022 02 05 04	Design, operation, errors, accuracy	x	x	x	x
022 02 05 05	Displays	x	x	x	x
022 02 06 00	**Vertical Speed Indicator**				
022 02 06 01	Design, operation, errors, accuracy	x	x	x	x

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
022 02 06 02	Displays	x	x	x	x
022 02 07 00	**Airspeed Indicator**				
022 02 07 01	The different speeds IAS, CAS, TAS: definition, usage and relationships	x	x	x	x
022 02 07 02	Design, operation, errors, accuracy	x	x	x	x
022 02 07 03	Displays	x	x	x	x
022 03 00 00	**MAGNETISM – DIRECT READING COMPASS**				
022 03 01 00	**Earth magnetic field**	x	x	x	x
022 03 02 00	**Direct reading compass**				
022 03 02 01	Design, operation, data processing, accuracy, deviation	x	x	x	x
022 03 02 02	Turning and acceleration errors	x	x	x	x
022 04 00 00	**GYROSCOPIC INSTRUMENTS**				
022 04 01 00	**Gyroscope: basic principles**				
022 04 01 01	Definitions, design	x	x	x	x
022 04 01 02	Fundamental properties	x	x	x	x
022 04 01 03	Drifts	x	x	x	x
022 04 02 00	**Turn and bank indicator**				
022 04 02 01	Design, operation, errors	x	x	x	x
022 04 03 00	**Attitude indicator**				
022 04 03 01	Design, operation, errors, accuracy	x	x	x	x
022 04 04 00	**Directional gyroscope**				
022 04 04 01	Design, operation, errors, accuracy	x	x	x	x
022 10 00 00	**COMMUNICATION SYSTEMS**				
022 10 01 00	**Transmission modes: VHF, HF, Satcom**				
022 10 01 01	Principles, bandwidth, operational limitations, use	x	x	x	x
022 10 02 00	**Voice communication**				
022 10 02 01	Definitions, general, applications	x	x	x	x
022 12 00 00	**ALERTING SYSTEMS, PROXIMITY SYSTEMS**				
022 12 02 00	**Flight Warning systems**				
022 12 02 01	Design, operation, indications and alarms	x	X	x	x
022 12 03 00	**Stall warning**				

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
022 12 03 01	Design, operation, indications and alarms	x	x		
022 12 08 00	**Radio-altimeter**				
022 12 08 01	Design, operation, errors, accuracy, indications			x	x
022 12 10 00	**Rotor/engine over speed alert system**				
022 12 10 01	Design, operation, displays, alarms			x	x
022 13 00 00	**INTEGRATED INSTRUMENTS – ELECTRONIC DISPLAYS**				
022 13 01 00	**Display units**				
022 13 01 01	Design, different technologies, limitations	x	x	x	x

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
030 00 00 00	**FLIGHT PERFORMANCE AND PLANNING**				
031 00 00 00	**MASS AND BALANCE – AEROPLANES/HELICOPTERS**				
031 01 00 00	**PURPOSE OF MASS AND BALANCE CONSIDERATIONS**				
031 01 01 00	**Mass limitations**				
031 01 01 01	Importance in regard to structural limitations	x	x	x	x
031 01 01 02	Importance in regard to performance limitations	x	x	x	x
031 01 02 00	**Centre of gravity (CG) limitations**				
031 01 02 01	Importance in regard to stability and controllability	x	x	x	x
031 01 02 02	Importance in regard to performance	x	x	x	x
031 02 00 00	**LOADING**				
031 02 01 00	**Terminology**				
031 02 01 01	Mass terms	x	x	x	x
031 02 01 02	Load terms (including Fuel Terms)	x	x	x	x
031 02 02 00	**Mass limits**				
031 02 02 01	Structural limitations	x	x	x	x
031 02 02 02	Performance limitations	x	x	x	x
031 02 02 03	Baggage compartment limitations	x	x	x	x

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
031 02 03 00	**Mass calculations**				
031 02 03 01	Maximum masses for Take-off and Landing	x	x	x	x
031 02 03 03	Use of standard masses for passengers, baggage and crew	x	x	x	x
031 03 00 00	**FUNDAMENTALS OF CG CALCULATIONS**				
031 03 01 00	Definition of centre of gravity	x	x	x	x
031 03 02 00	Conditions of equilibrium (Balance of Forces and Balance of Moments)	x	x	x	x
031 03 03 00	Basic calculations of CG	x	x	x	x
031 04 00 00	**MASS AND BALANCE DETAILS OF AIRCRAFT**				
031 04 01 00	**Contents of mass and balance documentation**				
031 04 01 01	Datum, moment arm	x	x	x	x
031 04 01 02	CG position as distance from datum	x	x	x	x
031 04 03 00	**Extraction of basic mass and balance data from aircraft documentation**				
031 04 03 01	Basic Empty Mass (BEM)	x	x	x	x
031 04 03 02	CG position and/or moment at BEM	x	x	x	x
031 04 03 03	Deviations from standard configuration	x	x	x	x
031 05 00 00	**DETERMINATION OF CG POSITION**				
031 05 01 00	**Methods**				
031 05 01 01	Arithmetic method	x	x	x	x
031 05 01 02	Graphic method	x	x	x	x
031 05 02 00	**Load and Trim Sheet**				
031 05 02 01	General considerations	x	x	x	x
031 05 02 02	Load sheet and CG envelope for light aeroplanes and for helicopters	X	x	x	x
032 00 00 00	**PERFORMANCE – AEROPLANES**				
032 01 00 00	**INTRODUCTION**				
032 01 01 00	Performance classes	x	x		
032 01 02 00	Stages of flight	x	x		
032 01 03 00	Effect of aeroplane mass, wind, altitude, runway slope, runway conditions	x	x		
032 01 04 00	Gradients	x	x		
032 02 00 00	**SINGLE-ENGINE AEROPLANES**				
032 02 01 00	Definitions of terms and speeds	x	x		

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
032 02 02 00	**Take-off and landing performance**				
032 02 02 02	Use of aeroplane flight manual data	x	x		
032 02 03 00	**Climb and cruise performance**				
032 02 03 01	Use of aeroplane flight data	x	x		
032 02 03 02	Effect of density altitude and aeroplane mass	x	x		
032 02 03 03	Endurance and the effects of the different recommended power/thrust settings	x	x		
032 02 03 04	Still air range with various power/thrust settings	x	x		

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
033 00 00 00	**FLIGHT PLANNING AND FLIGHT MONITORING**				
033 01 00 00	**FLIGHT PLANNING FOR VFR FLIGHTS**				
033 01 01 00	**VFR Navigation plan**				
033 01 01 01	Routes, airfields, heights and altitudes from VFR charts	x	x	x	x
033 01 01 02	Courses and distances from VFR charts	x	x	x	x
033 01 01 03	Aerodrome Charts and Aerodrome Directory	x	x	x	x
033 01 01 04	Communications and Radio Navigation planning data	x	x	x	x
033 01 01 05	Completion of navigation plan	x	x	x	x
033 03 00 00	**FUEL PLANNING**				
033 03 01 00	General knowledge	x	x	x	x
033 03 02 00	**Pre-flight calculation of fuel required**				
033 03 02 04	Calculation of Extra fuel	x	x	x	x
033 03 02 05	Completion of the fuel section of the navigation plan (fuel log) and calculation of total fuel	x	x	x	x
033 04 00 00	**PRE-FLIGHT PREPARATION**				
033 04 01 00	**AIP and NOTAM briefing**				
033 04 01 01	Ground facilities and services	x	x	x	x
033 04 01 02	Departure, destination and alternate aerodromes	x	x	x	x

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
033 04 01 03	Airway routings and airspace structure	x	x	x	x
033 04 02 00	**Meteorological briefing**				
033 04 02 01	Extraction and analysis of relevant data from meteorological documents	x	x	x	x
033 05 00 00	**ICAO FLIGHT PLAN (ATS Flight Plan)**				
033 05 02 00	**Individual flight Plan**				
033 05 02 01	Format of flight plan	x	x	x	x
033 05 02 02	Completion of the flight plan	x	x	x	x
033 05 03 00	Submission of the flight plan	x	x	x	x
033 06 00 00	**FLIGHT MONITORING AND IN-FLIGHT RE-PLANNING**				
033 06 01 00	**Flight monitoring**				
033 06 01 01	Monitoring of track and time	x	x	x	x
033 06 01 02	In-flight fuel management	x	x	x	x
033 06 02 00	In-flight re-planning in case of deviation from planned data	x	x	x	x

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
034 00 00 00	**PERFORMANCE – HELICOPTERS**				
034 01 00 00	**GENERAL**				
034 01 01 00	**Introduction**				
034 01 01 01	Stages of flight			x	x
034 01 01 02	Effect on performance of atmospheric, airport/heliport and helicopter conditions			x	x
034 01 02 00	**Applicability of Airworthiness Requirements**			x	x
034 01 03 00	**Definitions and terminology**			x	x
034 06 00 00	**PERFORMANCE – SINGLE ENGINE HELICOPTERS**				
034 06 01 00	**DEFINITIONS OF TERMS** – masses – velocities : V_x, V_y – velocity of best range and of maximum endurance – power limitations			x	x

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
	– altitudes				
034 06 02 00	**TAKE OFF – CRUISE – LANDING PERFORMANCE** **– Use and interpretation of diagrams and tables** Take-off - take off run and distance available - take off and initial climb - effects of mass, wind and density altitude - effects of ground surface and gradient Landing - effects of mass, wind, density altitude and approach speed - effects of ground surface and gradient In flight - relationship between power required and power available - performance diagram - effects of configuration, mass, temperature and altitude - reduction of performance during climbing turns - autorotation - adverse effects (icing, rain, condition of the airframe)			x	x

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
040 00 00 00	**HUMAN PERFORMANCE**				
040 01 00 00	**HUMAN FACTORS: BASIC CONCEPTS**				
040 01 01 00	**Human Factors in aviation**				
040 01 01 02	Becoming a competent pilot	x		x	
040 02 00 00	**BASIC AVIATION PHYSIOLOGY AND HEALTH MAINTENANCE**				
040 02 01 01	The atmosphere – composition – gas Laws	x		x	
040 02 01 02	Respiratory and circulatory systems – oxygen requirement of tissues – functional anatomy	x		x	

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
	– main forms of hypoxia (hypoxic and anaemic) – sources, effects and counter-measures of carbon monoxide – counter measures, hypoxia – symptoms of hypoxia – hyperventilation – the effects of accelerations on the circulatory system – hypertension and coronary heart disease				
040 02 02 00	**Man and Environment**				
040 02 02 01	Central, peripheral and autonomic nervous systems	x		x	
040 02 02 02	Vision – functional anatomy – visual field, foveal and peripheral vision – binocular and monocular vision – monocular vision cues – night vision – visual scanning and detection techniques and importance of “lookout” – defective vision	x		x	
040 02 02 03	Hearing – descriptive and functional anatomy – flight related hazards to hearing – hearing loss	x		x	
040 02 02 04	Equilibrium – functional anatomy – motion and acceleration – motion sickness	x		x	
040 02 02 05	Integration of sensory inputs – spatial disorientation: forms, recognition, avoidance – illusions: forms, recognition, avoidance – physical origin – physiological origin – psychological origin – approach and landing problems	x		x	
040 02 03 00	**Health and hygiene**				
040 02 03 01	Personal hygiene – personal fitness	x		x	
040 02 03 02	Body rhythm and sleep – rhythm disturbances – symptoms, effects, management	x		x	
040 02 03 03	Problems areas for pilots	x		x	

		Aeroplane		Helicopter	
		PPL	**Bridge**	**PPL**	**Bridge**
	– common minor ailments including cold, influenza and gastro-intestinal upset – entrapped gases, barotrauma, (scuba diving) – obesity – food hygiene – infectious diseases – nutrition – various toxic gases and materials				
040 02 03 04	Intoxication	x		x	
	– prescribed medication – tobacco – alcohol **and drugs** – caffeine – ~~drugs and~~ self-medication				
040 03 00 00	**BASIC AVIATION PSYCHOLOGY**				
040 03 01 00	**Human information processing**				
040 03 01 01	Attention and vigilance – selectivity of attention – divided attention	x		x	
040 03 01 02	Perception – perceptual illusions – subjectivity of perception – processes of perception	x		x	
040 03 01 03	Memory – sensory memory – working/short term memory – long term memory to include motor memory (skills)	x		x	
040 03 02 00	**Human error and reliability**				
040 03 02 01	Reliability of human behaviour	x		x	
040 03 02 04	Error generation – social environment (group, organisation)	x		x	
040 03 03 00	**Decision making**				
040 03 03 01	Decision-making concepts – structure (phases) – limits – risk assessment – practical application	x		x	
040 03 04 00	**Avoiding and managing errors: cockpit management**				
040 03 04 01	Safety awareness – risk area awareness	x		x	

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
	– situational awareness				
040 03 04 04	Communication – verbal and non-verbal communication	x		x	
040 03 05 00	**Human behaviour**				
040 03 05 01	Personality and attitudes – development – environmental influences	x		x	
040 03 05 03	Identification of hazardous attitudes (error proneness)	x		x	
040 03 06 00	**Human overload and underload**				
040 03 06 01	Arousal	x		x	
040 03 06 02	Stress – definition(s) – anxiety and stress – effects of stress	x		x	
040 03 06 05	Fatigue and stress management – types, causes and symptoms of fatigue – effects of fatigue – coping strategies – management techniques – health and fitness programmes	x		x	

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
050 00 00 00	**METEOROLOGY**				
050 01 00 00	**THE ATMOSPHERE**				
050 01 01 00	**Composition, extent, vertical division**				
050 01 01 01	Structure of the atmosphere	X		X	
050 01 01 02	Troposphere	X		X	
050 01 02 00	**Air temperature**				
050 01 02 01	Definition and units	X		X	
050 01 02 02	Vertical distribution of temperature	X		X	
050 01 02 03	Transfer of heat	X		X	
050 01 02 04	Lapse rates, stability and instability	X		X	
050 01 02 05	Development of inversions, types of inversions	X		X	
050 01 02 06	Temperature near the earth's surface, surface effects, diurnal and seasonal variation, effect of clouds, effect of wind	X		X	

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
050 01 03 00	**Atmospheric pressure**				
050 01 03 01	Barometric pressure, isobars	X		X	
050 01 03 02	Pressure variation with height	X		X	
050 01 03 03	Reduction of pressure to mean sea level	X		X	
050 01 03 04	Relationship between surface pressure centres and pressure centres aloft	X		X	
050 01 04 00	**Air density**				
050 01 04 01	Relationship between pressure, temperature and density	X		X	
050 01 05 00	**ICAO Standard Atmosphere (ISA)**				
050 01 05 01	ICAO Standard Atmosphere	X		X	
050 01 06 00	**Altimetry**				
050 01 06 01	Terminology and definitions	X		X	
050 01 06 02	Altimeter and altimeter settings	X		X	
050 01 06 03	Calculations	X		X	
050 01 06 04	Effect of accelerated airflow due to topography	X		X	
050 02 00 00	**WIND**				
050 02 01 00	**Definition and measurement of wind**				
050 02 01 01	Definition and measurement	X		X	
050 02 02 00	**Primary cause of wind**				
050 02 02 01	Primary cause of wind, pressure gradient, coriolis force, gradient wind	X		X	
050 02 02 02	Variation of wind in the friction layer	X		X	
050 02 02 03	Effects of convergence and divergence	x		x	

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
060 00 00 00	**NAVIGATION**				
061 00 00 00	**GENERAL NAVIGATION**				
061 01 00 00	**BASICS OF NAVIGATION**				
061 01 01 00	**The solar system**				
061 01 01 01	Seasonal and apparent movements of the sun	x		x	
061 01 02 00	**The earth**				

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
061 01 02 01	Great circle, small circle, rhumb line	x		x	
061 01 02 03	Latitude, difference of latitude	x		x	
061 01 02 04	Longitude, difference of longitude	x		x	
061 01 02 05	Use of latitude and longitude co-ordinates to locate any specific position	x		x	
061 01 03 00	**Time and time conversions**				
061 01 03 01	Apparent time	x		x	
061 01 03 02	UTC	x		x	
061 01 03 03	LMT	x		x	
061 01 03 04	Standard times	x		x	
061 01 03 05	Dateline	x		x	
061 01 03 06	Definition of sunrise, sunset and civil twilight	x		x	
061 01 04 00	**Directions**				
061 01 04 01	True north, magnetic north, compass north	x		x	
061 01 04 03	Compass deviation	x		x	
061 01 04 04	Magnetic poles, isogonals, relationship between true and magnetic	x		x	
061 01 05 00	**Distance**				
061 01 05 01	Units of distance and height used in navigation: nautical miles, statute miles, kilometres, metres and feet	x		x	
061 01 05 02	Conversion from one unit to another	x		x	
061 01 05 03	Relationship between nautical miles and minutes of latitude and minutes of longitude	x		x	
061 02 00 00	**MAGNETISM AND COMPASSES**				
061 02 01 00	**General Principles**				
061 02 01 01	Terrestrial magnetism	x		x	
061 02 01 02	Resolution of the earth's total magnetic force into vertical and horizontal components	x		x	
061 02 01 04	Variation-annual change	x		x	
061 02 02 00	**Aircraft magnetism**				
061 02 02 02	The resulting magnetic fields	x		x	
061 02 02 04	Keeping magnetic materials clear of the compass	x		x	
061 03 00 00	**CHARTS**				

		Aeroplane		Helicopter	
		PPL	Brid ge	PPL	Brid ge
061 03 01 00	**General properties of miscellaneous types of projections**				
061 03 01 01	Direct Mercator	x		x	
061 03 01 02	Lambert conformal conic	x		x	
061 03 02 00	**The representation of meridians, parallels, great circles and rhumb lines**				
061 03 02 01	Direct Mercator	x		x	
061 03 02 02	Lambert conformal conic	x		x	
061 03 03 00	**The use of current aeronautical charts**				
061 03 03 01	Plotting positions	x		x	
061 03 03 02	Methods of indicating scale and relief (ICAO topographical chart)	x		x	
061 03 03 03	Conventional signs	x		x	
061 03 03 02	Measuring tracks and distances	x		x	
061 03 03 03	Plotting bearings and distances	x		x	
061 04 00 00	**DEAD RECKONING NAVIGATION (DR)**				
061 04 01 00	**Basis of dead reckoning**				
061 04 01 01	Track	x		x	
061 04 01 02	Heading (compass, magnetic, true)	x		x	
061 04 01 03	Wind velocity	x		x	
061 04 01 04	Airspeed (IAS, CAS, TAS)	x		x	
061 04 01 05	Groundspeed	x		x	
061 04 01 06	ETA	x		x	
061 04 01 07	Drift, wind correction angle	x		x	
061 04 01 08	DR-position fix	x		x	
061 04 02 00	**Use of the navigational computer**				
061 04 02 01	Speed	x		x	
061 04 02 02	Time	x		x	
061 04 02 03	Distance	x		x	
061 04 02 04	Fuel consumption	x		x	
061 04 02 05	Conversions	x		x	
061 04 02 06	Airspeed	x		x	
061 04 02 07	Wind velocity	x		x	
061 04 02 08	True altitude	x		x	
061 04 03 00	**The triangle of velocities**				

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
061 04 03 01	Heading	x		x	
061 04 03 02	Ground speed	x		x	
061 04 03 03	Wind velocity	x		x	
061 04 03 04	Track and drift angle	x		x	
061 04 05 00	**Measurement of DR elements**				
061 04 05 01	Calculation of altitude	x		x	
061 04 05 03	Determination of appropriate speed	x		x	
061 05 00 00	**IN-FLIGHT NAVIGATION**				
061 05 01 00	**Use of visual observations and application to in-flight navigation**	x		x	
061 05 03 00	**Navigation in cruising flight, use of fixes to revise navigation data**				
061 05 03 01	Ground speed revision	x		x	
061 05 03 02	Off-track corrections	x		x	
061 05 03 03	Calculation of wind speed and direction	x		x	
061 05 03 04	ETA revisions	x		x	
061 05 04 00	**Flight Log**	x		x	

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
062 00 00 00	**RADIO NAVIGATION**				
062 01 00 00	**BASIC RADIO PROPAGATION THEORY**				
062 01 02 00	**Antennas**				
062 01 02 01	Characteristics	x		x	
062 01 03 00	**Wave propagation**				
062 01 03 04	Propagation with the frequency bands	x		x	
062 02 00 00	**RADIO AIDS**				
062 02 01 00	**Ground D/F**				
062 02 01 01	Principles	x		x	
062 02 01 02	Presentation and interpretation	x		x	
062 02 01 03	Coverage	x		x	
062 02 01 04	Range	x		x	
062 02 01 05	Errors and accuracy	x		x	
062 02 01 06	Factors affecting range and accuracy	x		x	

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
062 02 02 00	**NDB/ADF**				
062 02 02 01	Principles	x		x	
062 02 02 02	Presentation and interpretation	x		x	
062 02 02 03	Coverage	x		x	
062 02 02 04	Range	x		x	
062 02 02 05	Errors and accuracy	x		x	
062 02 02 06	Factors affecting range and accuracy	x		x	
062 02 03 00	**VOR**				
062 02 03 01	Principles	x		x	
062 02 03 02	Presentation and interpretation	x		x	
062 02 03 03	Coverage	x		x	
062 02 03 04	Range	x		x	
062 02 03 05	Errors and accuracy	x		x	
062 02 03 06	Factors affecting range and accuracy	x		x	
062 02 04 00	**DME**				
062 02 04 01	Principles	x		x	
062 02 04 02	Presentation and interpretation	x		x	
062 02 04 03	Coverage	x		x	
062 02 04 04	Range	x		x	
062 02 04 05	Errors and accuracy	x		x	
062 02 04 06	Factors affecting range and accuracy	x		x	
062 03 00 00	**RADAR**				
062 03 02 00	**Ground Radar**				
062 03 02 01	Principles	x		x	
062 03 02 02	Presentation and interpretation	x		x	
062 03 02 03	Coverage	x		x	
062 03 02 04	Range	x		x	
062 03 02 05	Errors and accuracy	x		x	
062 03 02 06	Factors affecting range and accuracy	x		x	
062 03 04 00	**Secondary Surveillance Radar and transponder**				
062 03 04 01	Principles	x		x	
062 03 04 02	Presentation and interpretation	x		x	
062 03 04 03	Modes and codes	x		x	

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
062 06 00 00	**GLOBAL NAVIGATION SATELLITE SYSTEMS**				
062 06 01 00	**GPS/GLONASS/GALILEO**				
062 06 01 01	Principles	x		x	
062 06 01 02	Operation	x		x	
062 06 01 03	Errors and accuracy	x		x	
062 06 01 04	Factors affecting accuracy	x		x	

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
070 00 00 00	**OPERATIONAL PROCEDURES**				
071 01 00 00	**GENERAL**				
071 01 01 00	**Operation of aircraft – ICAO Annex 6, General requirements**				
071 01 01 03	Definitions	x	x	x	X
071 01 01 04	Applicability	x	x	x	X
071 02 00 00	**SPECIAL OPERATIONAL PROCEDURES AND HAZARDS (GENERAL ASPECTS)**	x	x	x	x
071 02 04 00	**Noise abatement**				
071 02 04 01	Noise abatement procedures	x	x	x	X
071 02 04 02	Influence of the flight procedure (departure, cruise, approach)	x	x	x	X
071 02 04 03	**Runway incursion awareness (meaning of surface markings and signals)**	**x**	**x**	**x**	**X**
071 02 05 00	**Fire/smoke**				
071 02 05 01	Carburettor fire	x	x	x	X
071 02 05 02	Engine fire	x	x	x	X
071 02 05 03	Fire in the cabin, cockpit, (choice of extinguishing agents according to fire classification, use of the extinguishers)	x	x	x	X
071 02 05 04	Smoke in the cockpit and cabin (effects and action to be taken) smoke in the cockpit and cabin (effects and actions taken)	x	x	x	X
071 02 07 00	**Windshear and microburst**				
071 02 07 01	Effects and recognition during departure and approach	x	x	x	X
071 02 07 02	Actions to avoid and actions taken during encounter	x	x	x	X
071 02 08 00	**Wake turbulence**				
071 02 08 01	Cause	x	x	x	X
071 02 08 02	List of relevant parameters	x	x	x	X
071 02 08 03	Actions taken when crossing traffic, during take-off and landing	x	x	x	X

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
071 02 10 00	**Emergency and precautionary landings**				
071 02 10 01	Definition	x	x	x	X
071 02 10 02	Cause	x	x	x	X
071 02 10 03	Passenger information	x	x	x	X
071 02 10 04	Evacuation	x	x	x	X
071 02 10 05	Action after landing	x	x	x	X
071 02 13 00	**Contaminated runways**				
071 02 13 01	Kinds of contamination	x	X		
071 02 13 02	Estimated surface friction, friction coefficient	x	x		
071 02 14 00	**Rotor downwash**			x	X
071 02 15 00	**Operation influence by meteorological conditions (Helicopter)**				
071 02 15 01	White out/sand/dust			X	X
071 02 15 02	Strong winds			X	X
071 02 15 03	Mountain environment			x	X
071 03 00 00	**EMERGENCY PROCEDURES**				
071 03 01 00	**Influence by technical problems**				
071 03 01 01	Engine failure			X	X
071 03 01 02	Fire in cabin/cockpit/engine			X	X
071 03 01 03	Tail/rotor/directional control failure			X	X
071 03 01 04	Ground resonance			X	X
071 03 01 05	Blade stall			x	X
071 03 01 06	Settling with power (vortex ring)			X	x
071 03 01 07	Overpitch			X	X
071 03 01 08	Overspeed: rotor/engine			X	X
071 03 01 09	Dynamic rollover			X	X
071 03 01 10	Mast bumping			x	X

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
080 00 00 00	**PRINCIPLES OF FLIGHT**				
081 00 00 00	**PRINCIPLES OF FLIGHT – AEROPLANE**				
081 01 00 00	**SUBSONIC AERODYNAMICS**				
081 01 01 00	**Basics concepts, laws and definitions**				
081 01 01 01	Laws and definitions – conversion of units – Newton´s laws – Bernoulli's equation, venturi – static pressure, dynamic pressure, total pressure	x	x		

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
	– density – IAS, TAS				
081 01 01 02	Basics about airflow – streamline – two-dimensional airflow – three-dimensional airflow	x	x		
081 01 01 03	Aerodynamic forces on surfaces – resulting airforce – lift – drag – angle of attack	x	x		
081 01 01 04	Shape of an aerofoil section – thickness to chord ratio – chord line – camber line – camber – angle of attack	x	x		
081 01 01 05	The wing shape – aspect ratio – root chord – tip chord – tapered wings – wing planform	x	x		
081 01 02 00	**The two-dimensional airflow about an aerofoil**				
081 01 02 01	Streamline pattern	x	x		
081 01 02 02	Stagnation point	x	x		
081 01 02 03	Pressure distribution	x	x		
081 01 02 04	Centre of pressure	x	x		
081 01 02 07	Influence of angle of attack	x	x		
081 01 02 08	Flow separation at high angles of attack	x	x		
081 01 02 09	The Lift – α graph	x	x		
081 01 03 00	**The coefficients**				
081 01 03 01	The lift coefficient C_l – the lift formula	x	x		
081 01 03 02	The drag coefficient C_d – the drag formula	x	x		
081 01 04 00	**The three-dimensional airflow round a wing and a fuselage**				

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
081 01 04 01	Streamline pattern – span-wise flow and causes – tip vortices and angle of attack – upwash and downwash due to tip vortices – wake turbulence behind an aeroplane (causes, distribution, duration of the phenomenon)	x	x		
081 01 04 02	Induced drag – influence of tip vortices on the angle of attack – the induced local α – influence of induced angle of attack on the direction of the lift vector – induced drag and angle of attack	x	x		
081 01 05 00	**Drag**				
081 01 05 01	The parasite drag – pressure drag – interference drag – friction drag	x	x		
081 01 05 02	The parasite drag and speed	x	x		
081 01 05 03	The induced drag and speed	x	x		
081 01 05 04	The total drag	x	x		
081 01 06 00	**The ground effect**				
081 01 06 04	Effect on take-off and landing characteristics of an aeroplane	x	x		
081 01 08 00	**The stall**				

081 01 08 01	Flow separation at increasing angles of attack
	– the boundary layer:
	  – laminar layer
	  – turbulent layer
	  – transition
	– separation point
	– influence of angle of attack
	– influence on:
	  – pressure distribution
	  – location of centre of pressure
	  – C_L
	  – C_D
	  – pitch moments
	– buffet
		x	x		

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
	– use of controls				

081 01 08 02	The stall speed
	– in the lift formula
	– 1g stall speed
	– influence of:
	  – the centre of gravity
	  – power setting
	  – altitude (IAS)
	  – wing loading
	  – load factor n:
	    – definition
	    – turns
	    – forces
		x	x		

081 01 08 03	The initial stall in span-wise direction – influence of planform – geometric twist (wash out) – use of ailerons	x	x		
081 01 08 04	Stall warning – importance of stall warning – speed margin – buffet – stall strip – flapper switch – recovery from stall	x	x		

081 01 08 05	Special phenomena of stall
	– the power-on stall
	– climbing and descending turns
	– T-tailed aeroplane
	– avoidance of spins:
	  – spin development
	  – spin recognition
	  – spin recovery
	– ice (in stagnation point and on surface):
	  – absence of stall warning
	  – abnormal behaviour of the aircraft during stall
		x	x		

081 01 09 00	**C_L augmentation**				
081 01 09 01	Trailing edge flaps and the reasons for use in take-off and landing – influence on C_L - α-graph – different types of flaps	x	x		

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
	– flap asymmetry – influence on pitch movement				
081 01 09 02	Leading edge devices and the reasons for use in take-off and landing	x	x		
081 01 11 00	**The boundary layer**				
081 01 11 01	Different types – laminar – turbulent	x	x		
081 01 12 00	**Special circumstances**				
081 01 12 01	Ice and other contamination – ice in stagnation point – ice on the surface (frost, snow, clear ice) – rain – contamination of the leading edge – effects on stall – effects on loss of controllability – effects on control surface moment – influence on high lift devices during take-off, landing and low speeds	x	x		
081 04 00 00	**STABILITY**				
081 04 01 00	**Condition of equilibrium in steady horizontal flight**				
081 04 01 01	Precondition for static stability	x	x		
081 04 01 02	Equilibrium – lift and weight – drag and thrust	x	x		
081 04 02 00	**Methods of achieving balance**				
081 04 02 01	Wing and empennage (tail and canard)	x	x		
081 04 02 02	Control surfaces	x	x		
081 04 02 03	Ballast or weight trim	x	x		
081 04 03 00	**Static and dynamic longitudinal stability**				
081 04 03 01	Basics and definitions – static stability, positive, neutral and negative – precondition for dynamic stability – dynamic stability, positive, neutral and negative	x	x		
081 04 03 05	Location of centre of gravity – aft limit, minimum stability margin	x	x		

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
	– forward position – effects on static and dynamic stability				
081 04 06 00	**Dynamic lateral/directional stability**				
081 04 06 02	Spiral dive, corrective actions	x	x		
081 05 00 00	**CONTROL**				
081 05 01 00	**General**				
081 05 01 01	Basics, the three planes and three axis	x	x		
081 05 01 03	Angle of attack change	x	x		
081 05 02 00	**Pitch control**				
081 05 02 01	Elevator	x	x		
081 05 02 02	Downwash effects	x	x		
081 05 02 04	Location of centre of gravity	x	x		
081 05 03 00	**Yaw control**				
081 05 03 01	Pedal/Rudder	x	x		
081 05 04 00	**Roll control**				
081 05 04 01	Ailerons – function in different phases of flight	x	x		
081 05 04 04	Adverse yaw	x	x		
081 05 04 05	Means to avoid adverse yaw – frise ailerons – differential ailerons deflection	x	x		
081 05 06 00	**Means to reduce control forces**				
081 05 06 01	Aerodynamic balance – balance tab, anti-balance tab – servo tab	x	x		
081 05 07 00	**Mass balance**				
081 05 07 01	Reasons to balance – means	x	x		
081 05 08 00	**Trimming**				
081 05 08 01	Reasons to trim	x	x		
081 05 08 02	Trim tabs	x	x		
081 06 00 00	**LIMITATIONS**				
081 06 01 00	**Operating limitations**				
081 06 01 01	Flutter	x	x		
081 06 01 03	V_{FE}	x	x		

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
081 06 01 04	V_{NO}, V_{NE}	x	x		
081 06 02 00	**Manoeuvring envelope**				
081 06 02 01	Manoeuvring load diagram – load factor – accelerated stall speed – V_A – manoeuvring limit load factor/certification category	x	x		
081 06 02 02	Contribution of : – mass	x	x		
081 06 03 00	**Gust envelope**				
081 06 03 01	Gust load diagram	x	x		
081 06 03 02	Factors contributing to gust loads	x	x		
081 07 00 00	**PROPELLERS**				
081 07 01 00	**Conversion of engine torque to thrust**				
081 07 01 01	Meaning of pitch	x	x		
081 07 01 02	Blade twist	x	x		
081 07 01 05	Effects of ice on propeller	x	x		
081 07 02 00	**Engine failure or engine stop**				
081 07 02 01	Windmilling drag	x	x		
081 07 04 00	**Moments due to propeller operation**				
081 07 04 01	Torque reaction	x	x		
081 07 04 03	Asymmetric slipstream effect	x	x		
081 07 04 04	Asymmetric blade effect	x	x		
081 08 00 00	**FLIGHT MECHANICS**				
081 08 01 00	**Forces acting on an aeroplane**				
081 08 01 01	Straight horizontal steady flight	x	x		
081 08 01 02	Straight steady climb	x	x		
081 08 01 03	Straight steady descent	x	x		
081 08 01 04	Straight steady glide	x	x		
081 08 01 05	Steady coordinated turn – bank angle – load factor – turn radius – rate one turn	x	x		

		Aeroplane PPL	Aeroplane Bridge	Helicopter PPL	Helicopter Bridge
082 00 00 00	**PRINCIPLES OF FLIGHT – HELICOPTER**			x	x
082 01 00 00	**SUBSONIC AERODYNAMICS**			x	x
082 01 01 00	Basic concepts, laws and definitions			x	x
082 01 01 01	Conversion of units			x	x
082 01 01 02	Definitions and basic concepts about air – The atmosphere, International Standard Atmosphere – Density – Influence of pressure and temperature on density			x	x
082 01 01 03	Newton's Laws – Newton's second law : Momentum equation – Newton's third law : action and reaction			x	x
082 01 01 04	Basic concepts about airflow – Steady airflow and unsteady airflow – Bernoulli's equation – Static pressure, dynamic pressure, total pressure, stagnation point – TAS, IAS, – Two-dimensional airflow, three-dimensional airflow – Viscosity, boundary layer			x	x
082 01 02 00	Two-dimensional airflow			x	x
082 01 02 01	Aerofoil section geometry – Aerofoil section – Chord line, thickness, thickness to chord ratio of a section – Camber line, camber – Symmetrical and asymmetrical aerofoils sections			x	x
082 01 02 02	Aerodynamic forces on aerofoil elements – Angle of attack – Pressure distribution – Lift and lift coefficient – Relation lift coefficient - angle of attack – Profile drag and drag coefficient – Relation drag coefficient – angle of attack – Resulting force, centre of pressure, pitching moment			x	x
082 01 02 03	Stall – Boundary layer and reasons for stalling			x	x

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
	– Variation of lift and drag as a function of angle of attack – Displacement of the centre of pressure, pitching moment				
082 01 02 04	Disturbances due to profile contamination – Ice contamination – Ice on the surface (frost, snow, clear ice)			x	x
082 01 03 00	The three-dimensional airflow round a wing and a fuselage			x	x
082 01 03 01	The wing – Planform, rectangular and tapered wings – Wing twist			x	x
082 01 03 02	Airflow pattern and influence on lift – Span wise flow on upper and lower surface – Tip vortices – Span-wise lift distribution			x	x
082 01 03 03	Induced drag			x	x
	– Causes, vortices				
082 01 03 04	The airflow round an fuselage – Components of a fuselage – Parasite drag – Variation with speed			x	x
082 02 00 00	**TRANSONIC AERODYNAMICS and COMPRESSIBILITY EFFECTS**			x	x
082 02 01 00	Airflow velocities			x	x
082 02 01 01	Airflow speeds – Speed of sound – Subsonic, high subsonic and supersonic flows			x	x
082 02 01 02	Shock waves - Compressibility and shock waves - The reasons for their formation at upstream high subsonic airflow - Their effect on lift, drag			x	x
082 02 01 03	Influence of wing planform – Sweep-angle			x	x
082 03 00 00	**ROTORCRAFT TYPES**			x	x
082 03 01 00	Rotorcraft			x	x
082 03 01 01	Rotorcraft types			x	x

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
	– Autogyro – Helicopter				
082 03 02 00	Helicopters			x	x
082 03 02 01	Helicopters configurations – The single main rotor helicopter			x	x
082 03 02 02	The helicopter, characteristics and associated terminology – General lay-out, fuselage, engine, gearbox – Tail rotor, Fenestron, No Tail Rotor (Notar) – Engines (reciprocating and turbo shaft engines) – Power transmission – Rotor shaft axis, rotor hub and rotor blades – Rotor disc and rotor disc area – Teetering rotor (two blades) and rotors with more than two blades – Skids and wheels – Helicopter axes, fuselage centre line – Roll axis, pitch axis, normal or yaw axis – Gross mass and gross weight, disc loading			x	x
082 04 00 00	**MAIN ROTOR AERODYNAMICS**			x	x
082 04 01 00	Hover flight outside ground effect			x	x
082 04 01 01	Airflow through the rotor discs and round the blades – Circumferential velocity of the blade sections – Induced airflow, through the disc and downstream – Downward fuselage drag – Equilibrium of rotor thrust, weight and fuselage drag – Rotor disc induced power – Relative airflow to the blade – Pitch angle and angle of attack of a blade section – Lift and profile drag on the blade element – Resulting lift and thrust on the blade and rotor thrust – Collective pitch angle changes, necessity of blade feathering – Required total main rotor-torque and rotor-power			x	x

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
	- Influence of the air density				
082 04 01 02	Anti-torque force and tail rotor – Force of tail rotor as a function of main rotor-torque – Anti-torque rotor power – Necessity of blade feathering of tail rotor blades, yaw pedals			x	x
082 04 01 03	Maximum hover altitude OGE – Total power required, power available – Maximum hover altitude as a function of pressure altitude, OAT.			x	x
082 04 02 00	Vertical climb			x	x
082 04 02 01	Relative airflow and angles of attack – Climb velocity V_C , induced and relative velocity, angle of attack – Collective pitch angle and blade feathering			x	x
082 04 02 02	Power and vertical speed – Induced power, climb power, profile power – Total main rotor power and main rotor torque – Tail rotor power – Total power requirement in vertical flight			x	x
082 04 03 00	Forward flight			x	x
082 04 03 01	Airflow and forces in uniform inflow distribution – Assumption of uniform inflow distribution on rotor disc – Advancing blade (90°) and retreating blade (270°) – Airflow velocity relative to the blade sections, area of reverse flow – Lift on the advancing and retreating blades at constant pitch angles – Necessity of cyclic pitch changes – Compressibility effects on the advancing blade tip and speed limitations – High angle of attack on the retreating blade, blade stall and speed limitations – Thrust on rotor disc and tilt of thrust vector – Vertical component of the thrust vector and gross weight equilibrium – Horizontal component of the thrust vector and drag equilibrium			x	x

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
082 04 03 02	The flare (power flight) – Thrust reversal, increase in rotor thrust – Increase of rotor RPM on non governed rotor			x	x
082 04 03 04	Power and maximum speed – Induced power as a function of helicopter speed – Rotor profile power as a function of helicopter speed – Fuselage drag and parasite power as a function of forward speed – Tail rotor power, power ancillary equipment – Total power requirement as a function of forward speed – Influence of helicopter mass, air density and drag of additional external equipment – Translational lift and influence on power required			x	x
082 04 04 00	Hover and forward flight in ground effect			x	x
082 04 04 01	Airflow in ground effect, downwash – Rotor power decrease as a function of rotor height above the ground at constant helicopter mass			x	x
082 04 05 00	Vertical descent			x	x
082 04 05 01	Vertical descent, power on – Airflow through the rotor, low and moderate descent speeds – Vortex ring state, settling with power, consequences			x	x
082 04 05 02	Autorotation – Collective lever position after failure – Up flow through the rotor, auto-rotation and anti-autorotation rings – Tail rotor thrust and yaw control – Control of rotor RPM with collective lever – Landing after increase of rotor thrust by pulling collective, reduction in vertical speed			x	x
082 04 06 00	Forward flight - Autorotation			x	x
082 04 06 01	Airflow through the rotor disc – Descent speed and up flow through the disc			x	x

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
	– The flare, increase in rotor thrust, reduction of vertical speed and ground speed				
082 04 06 02	Flight and landing – Turning – Flare – Auto-rotative landing – Height/velocity avoidance graph, dead man's curve			x	x
082 05 00 00	**MAIN ROTOR MECHANICS**			x	x
082 05 01 00	Flapping of the blade in hover			x	x
082 05 01 01	Forces and stresses on the blade – Centrifugal force on the blade and attachments – Limits of rotor RPM – Lift on the blade and bending stresses on a rigid attachment – The flapping hinge of the articulated rotor, flapping hinge offset – The flapping of the hinge less rotor, flexible element			x	x
082 05 01 03	Coning angle in hover – Lift and centrifugal force in hover, blade weight negligible – Flapping, tip path plane and disc area			x	x
082 05 02 00	Flapping angles of the blade in forward flight			x	x
082 05 02 01	Forces on the blade in forward flight without cyclic feathering – Aerodynamic forces on the advancing and retreating blades without cyclic feathering – Periodic forces and stresses, fatigue, flapping hinge – Phase lag between the force and the flapping angle (about 90°) – Flapping motion of the hinged blades and tilting of the cone, flap back of rotor – Rotor disc attitude and thrust vector tilt			x	x
082 05 02 02	Cyclic pitch (feathering) in helicopter mode, forward flight – Necessity of forward rotor disc tilt and thrust vector tilt – Flapping and tip path plane, virtual rotation axis or no flapping axis, plane of rotation			x	x

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
	– Shaft axis and hub plane – Cyclic pitch change (feathering) and rotor thrust vector tilt – Collective pitch change, collective lever, swash plate, pitch link and pitch horn – Cyclic stick, rotating swash plate and pitch link movement, phase angle				
082 05 03 00	Blade lag motion			x	x
082 05 03 01	Forces on the blade in the disc plane (tip path plane) in forward flight – Forces due to the Coriolis effect because of the flapping – Alternating stresses and the need of the drag or lag hinge			x	x
082 05 03 02	The drag or lag hinge – The drag hinge in the fully articulated rotor – The lag flexure in the hinge less rotor – Drag dampers			x	x
082 05 03 03	Ground resonance – Blade lag motion and movement of the centre of gravity of the blades and the rotor – Oscillating force on the fuselage – Fuselage and undercarriage, resonance			x	x
082 05 04 00	Rotor systems			x	x
082 05 04 01	See-saw or teetering rotor			x	x
082 05 04 02	Fully articulated rotor – Three hinges arrangement – Bearings and elastomeric hinges			x	x
082 05 04 03	Hinge less rotor, bearing less rotor			x	x
082 05 05 00	Blade sailing – Low rotor RPM and effect of adverse wind – Minimising the danger – Droop stops			x	x
082 05 06 00	Vibrations due to main rotor – Origins of the vibrations, in plane and vertical – Blade tracking and balancing			x	x
082 06 00 00	**TAIL ROTORS**			x	x
082 06 01 00	Conventional tail rotor			x	x
082 06 01 01	Rotor description			x	x

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
	– Two-blades tail rotors with teetering hinge – Rotors with more than two blades – Feathering bearings and flapping hinges – Dangers to people and to the tail rotor, rotor height and safety				
082 06 01 02	Aerodynamics – Induced airflow and tail rotor thrust – Thrust control by feathering, tail rotor drift and roll – Effect of tail rotor failure, vortex ring			x	x
082 06 02 00	The fenestron – Technical lay-out			x	x
082 06 03 00	The NOTAR – Technical lay-out			x	x
082 06 04 00	Vibrations – High frequency vibrations due to the tail rotors			x	x
082 07 00 00	**EQUILIBRIUM, STABILITY AND CONTROL**			x	x
082 07 01 00	Equilibrium and helicopter attitudes			x	x
082 07 01 01	Hover – Forces and equilibrium conditions – Helicopter pitching moment and pitch angle – Helicopter rolling moment and roll angle			x	x
082 07 01 02	Forward flight – Forces and equilibrium conditions – Helicopter moments and angles – Effect of speed on fuselage attitude			x	x
082 07 03 00	Control			x	x
082 07 03 02	Control power – Fully articulated rotor – Hinge less rotor – Teetering rotor			x	x
082 07 03 03	Static and dynamic roll over			x	x
082 08 00 00	**HELICOPTER PERFORMANCES**			X	X
082 08 01 00	Engine performances			x	x
082 08 01 01	Piston engines – Power available			x	x

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
	– Effects of density altitude				
082 08 01 02	Turbine engines – Power available – Effects of ambient pressure and temperature.			x	x
082 08 02 00	Helicopter performances			x	x
082 08 02 01	Hover and vertical flight – Power required and power available – OGE and IGE maximum hover height – Influence of AUM, pressure, temperature, density			x	x
082 08 02 02	Forward flight – Maximum speed – Maximum rate of climb speed – Maximum angle of climb speed – Range and endurance – Influence of AUM, pressure, temperature, density			x	x
082 08 02 03	Manoeuvring – Load factor – Bank angle and number of g's – Manoeuvring limit load factor			x	x
082 08 02 04	Special conditions – Operating with limited power – Over pitch, over torque			x	x

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
090 00 00 00	**COMMUNICATIONS**				
091 00 00 00	**VFR COMMUNICATIONS**				
091 01 00 00	**DEFINITIONS**				
091 01 01 00	Meanings and significance of associated terms	x		x	
091 01 02 00	Air Traffic Services abbreviations	X		X	
091 01 03 00	Q-code groups commonly used in RTF air-ground communications	x		x	
091 01 04 00	Categories of messages	x		x	
091 02 00 00	**GENERAL OPERATING PROCEDURES**				
091 02 01 00	Transmission of letters	X		X	

		Aeroplane		Helicopter	
		PPL	Bridge	PPL	Bridge
091 02 02 00	Transmission of numbers (including level information)	X		X	
091 02 03 00	Transmission of time	X		X	
091 02 04 00	Transmission technique	X		X	
091 02 05 00	Standard words and phrases (relevant RTF phraseology included)	X		X	
091 02 06 00	Radiotelephony call signs for aeronautical stations including use of abbreviated call signs	X		X	
091 02 07 00	Radiotelephony call signs for aircraft including use of abbreviated call signs	X		X	
091 02 08 00	Transfer of communication	X		X	
091 02 09 00	Test procedures including readability scale	X		X	
091 02 10 00	Read back and acknowledgement requirements	X		X	
091 03 00 00	**RELEVANT WEATHER INFORMATION TERMS (VFR)**				
091 03 01 00	Aerodrome weather	X		X	
091 03 02 00	Weather broadcast	X		X	
091 04 00 00	**ACTION REQUIRED TO BE TAKEN IN CASE OF COMMUNICATION FAILURE**	X		X	
091 05 00 00	**DISTRESS AND URGENCY PROCEDURES**				
091 05 01 00	Distress (definition – frequencies – watch of distress frequencies – distress signal – distress message)	X		X	
091 05 02 00	Urgency (definition – frequencies – urgency signal – urgency message)	X		X	
091 06 00 00	**GENERAL PRINCIPLES OF VHF PROPAGATION AND ALLOCATION OF FREQUENCIES**	x		x	

AMC No 2 to FCL.210 and FCL.215

Syllabus of theoretical knowledge for the private pilot licence – airships

The following table contains the syllabi for the courses of theoretical knowledge, as well as for the theoretical knowledge examinations for the PPL(As). The training and examination should cover aspects related to non-technical skills in an integrated manner, taking into account the particular risks associated to the licence and the activity.

		PPL
010 00 00 00	**AIR LAW AND ATC PROCEDURES**	
010 01 00 00	INTERNATIONAL LAW: CONVENTIONS, AGREEMENTS AND ORGANISATIONS	**X**
010 02 00 00	AIRWORTHINESS OF AIRCRAFT	**X**
010 03 00 00	AIRCRAFT NATIONALITY AND REGISTRATION MARKS	**X**
010 04 00 00	PERSONNEL LICENSING	**X**
010 05 00 00	RULES OF THE AIR	**X**
010 06 00 00	PROCEDURES FOR AIR NAVIGATION SERVICES – AIRCRAFT OPERATIONS	**X**
010 07 00 00	AIR TRAFFIC SERVICES AND AIR TRAFFIC MANAGEMENT	**X**
010 08 00 00	AERONAUTICAL INFORMATION SERVICE	**X**
010 09 00 00	AERODROMES	**X**
010 11 00 00	SEARCH AND RESCUE	**X**
010 12 00 00	SECURITY	**X**
010 13 00 00	AIRCRAFT ACCIDENT AND INCIDENT INVESTIGATION	**X**
010 15 00 00	NATIONAL LAW	**X**

		PPL
023 00 00 00	**AIRSHIP GENERAL KNOWLEDGE – ENVELOPE, AIRFRAME AND SYSTEMS, ELECTRICS, POWERPLANT, EMERGENCY EQUIPMENT**	
023 01 00 00	DESIGN, MATERIALS,LOADS, STRESSES	**X**
023 02 00 00	ENVELOPE AND AIRBAGS	**X**
023 03 00 00	FRAMEWORK	**X**
023 04 00 00	GONDOLA	**X**
023 05 00 00	FLIGHT CONTROLS	**X**
023 06 00 00	LANDING GEAR	**X**
023 07 00 00	HYDRAULICS AND PNEUMATICS	**X**
023 08 00 00	HEATING AND AIR CONDITIONING	**X**
023 09 00 00	FUEL SYSTEM	**X**
023 10 00 00	PISTON ENGINES (PROPELLERS)	**X**
023 11 00 00	TURBINE ENGINES (BASICS)	**X**
023 12 00 00	ELECTRICS	**X**
023 13 00 00	FIRE PROTECTION AND DETECTION SYSTEMS	**X**
023 14 00 00	MAINTENANCE	**X**

		PPL
024 00 00 00	**AIRSHIP GENERAL KNOWLEDGE – INSTRUMENTATION**	

024 01 00 00	SENSORS AND INSTRUMENTS	**X**
024 02 00 00	MEASUREMENT OF AIR DATA AND GAS PARAMETERS	**X**
024 03 00 00	MAGNETISM – DIRECT READING COMPASS AND FLUX VALVE	**X**
024 04 00 00	GYROSCOPIC INSTRUMENTS	**X**
024 05 00 00	COMMUNICATION SYSTEMS	**X**
024 06 00 00	ALERTING SYSTEMS	**X**
024 07 00 00	INTEGRATED INSTRUMENTS – ELECTRONIC DISPLAYS	**X**
024 08 00 00	FLIGHT MANAGEMENT SYSTEM (GENERAL BASICS)	**X**
024 09 00 00	DIGITAL CIRCUITS AND COMPUTERS	**X**

		PPL
030 00 00 00	**FLIGHT PERFORMANCE AND PLANNING**	
031 00 00 00	**MASS AND BALANCE – AIRSHIPS**	
031 01 00 00	PURPOSE OF MASS AND BALANCE CONSIDERATIONS	**X**
031 02 00 00	LOADING	**X**
031 03 00 00	FUNDAMENTALS OF CG CALCULATIONS	**X**
031 04 00 00	MASS AND BALANCE DETAILS OF AIRCRAFT	**X**
031 05 00 00	DETERMINATION OF CG POSITION	**X**
031 06 00 00	PASSENGER, CARGO AND BALLAST HANDLING	**X**

		PPL
035 00 00 00	**PERFORMANCE – AIRSHIPS**	
035 01 00 00	AIRWORTHINESS REQUIREMENTS	**X**
035 02 00 00	BASICS OF AIRSHIP PERFORMANCE	**X**
035 03 00 00	DEFINITIONS AND TERMS	**X**
035 04 00 00	STAGES OF FLIGHT	**X**
035 05 00 00	USE OF FLIGHT MANUAL	**X**

		PPL
033 00 00 00	**FLIGHT PLANNING AND FLIGHT MONITORING**	
033 01 00 00	FLIGHT PLANNING FOR VFR FLIGHTS	**X**
033 03 00 00	FUEL PLANNING	**X**
033 04 00 00	PRE-FLIGHT PREPARATION	**X**
033 05 00 00	ATS FLIGHT PLAN	**X**
033 06 00 00	FLIGHT MONITORING AND IN-FLIGHT RE-PLANNING	**X**

		PPL
040 00 00 00	**HUMAN PERFORMANCE**	
040 01 00 00	HUMAN FACTORS: BASIC CONCEPTS	**X**
040 02 00 00	BASIC AVIATION PHYSIOLOGY AND HEALTH MAINTENANCE	**X**
040 03 00 00	BASIC AVIATION PSYCHOLOGY	**X**

		PPL
050 00 00 00	**METEOROLOGY**	
050 01 00 00	THE ATMOSPHERE	**X**
050 02 00 00	WIND	**X**
050 03 00 00	THERMODYNAMICS	**X**
050 04 00 00	CLOUDS AND FOG	**X**
050 05 00 00	PRECIPITATION	**X**

050 06 00 00	AIR MASSES AND FRONTS	**X**
050 07 00 00	PRESSURE SYSTEMS	**X**
050 08 00 00	CLIMATOLOGY	**X**
050 09 00 00	FLIGHT HAZARDS	**X**
050 10 00 00	METEOROLOGICAL INFORMATION	**X**

		PPL
060 00 00 00	**NAVIGATION**	
061 00 00 00	GENERAL NAVIGATION	
061 01 00 00	BASICS OF NAVIGATION	**X**
061 02 00 00	MAGNETISM AND COMPASSES	**X**
061 03 00 00	CHARTS	**X**
061 04 00 00	DEAD RECKONING NAVIGATION (DR)	**X**
061 05 00 00	IN-FLIGHT NAVIGATION	**X**

		PPL
062 00 00 00	**RADIO NAVIGATION**	
062 01 00 00	BASIC RADIO PROPAGATION THEORY	**X**
062 02 00 00	RADIO AIDS	**X**
062 03 00 00	RADAR	**X**
062 06 00 00	GLOBAL NAVIGATION SATELLITE SYSTEMS	**X**

		PPL
070 00 00 00	**OPERATIONAL PROCEDURES AIRSHIP**	
073 01 00 00	**GENERAL REQUIREMENTS**	**X**
073 02 00 00	SPECIAL OPERATIONAL PROCEDURES AND HAZARDS (GENERAL ASPECTS)	**X**
073 03 00 00	EMERGENCY PROCEDURES	**X**

		PPL
080 00 00 00	**PRINCIPLES OF FLIGHT**	**X**
083 00 00 00	**PRINCIPLES OF FLIGHT – AIRSHIPS**	**X**
083 01 00 00	BASICS OF AEROSTATICS	**X**
083 02 00 00	BASICS OF SUBSONIC AERODYNAMICS	**X**
083 03 00 00	AERODYNAMICS OF AIRSHIPS	**X**
083 04 00 00	STABILITY	**X**
083 05 00 00	CONTROLLABILITY	**X**
083 06 00 00	LIMITATIONS	**X**
083 07 00 00	PROPELLERS	**X**
083 08 00 00	BASICS OF AIRSHIP FLIGHT MECHANICS	**X**

		PPL
090 00 00 00	**COMMUNICATIONS**	
091 00 00 00	**VFR COMMUNICATIONS**	**X**
091 01 00 00	DEFINITIONS	**X**
091 02 00 00	GENERAL OPERATING PROCEDURES	**X**
091 03 00 00	RELEVANT WEATHER INFORMATION TERMS (VFR)	**X**
091 04 00 00	ACTION REQUIRED TO BE TAKEN IN CASE OF COMMUNICATION FAILURE	**X**
091 05 00 00	DISTRESS AND URGENCY PROCEDURES	**X**

091 06 00 00	GENERAL PRINCIPLES OF VHF PROPAGATION AND ALLOCATION OF FREQUENCIES	**X**

AMC No 3 to FCL.210 and FCL.215

Syllabus of theoretical knowledge for the balloon pilot licence and the sailplane pilot licence

The syllabi for the theoretical knowledge instruction and examination for the L**A**PL(B) and L**A**PL(S) in AMC to FCL.115 and FCL.120 should be used for the BPL and SPL, respectively.

AMC No 1 to FCL.215 and FCL. 235~~220~~
Theoretical knowledge examination and skill test for the PPL

1. THEORETICAL KNOWLEDGE EXAMINATION

   1.1 The examinations should comprise a total of 120 multiple choice questions covering all the subjects.

   1.2 Communication practical classroom testing may be conducted.

   1.3 The period of 18 months mentioned in FCL.025(b)(2) should be counted from the end of the calendar month when the applicant first attempted an examination.

2. SKILL TEST

   2.1 Further training may be required following any failed skill test or part thereof. There should be no limit to the number of skill tests that may be attempted.

3. CONDUCT OF THE TEST

   3.1 If the applicant chooses to terminate a skill test for reasons considered inadequate by the flight examiner, the applicant should retake the entire skill test. If the test is terminated for reasons considered adequate by the flight examiner, only those sections not completed should be tested in a further flight.

   3.2 -Any manoeuvre or procedure of the test may be repeated once by the applicant. The flight examiner may stop the test at any stage if it is considered that the applicant’s demonstration of flying skill requires a complete retest.

   3.3 An applicant should be required to fly the aircraft from a position where the pilot-in-command functions can be performed and to carry out the test as if there is no other crew member. Responsibility for the flight should be allocated in accordance with national regulations.

AMC No 1 to FCL. 235~~220~~
Contents of the skill test for the issue of a PPL(A)

1. The route to be flown for the navigation test should be chosen by the flight examiner (FE). The route may end at the aerodrome of departure or at another aerodrome. The applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board. The navigation section of the test should have a duration that allows the pilot to demonstrate his/her ability

to complete a route with at least three identified waypoints and may, as agreed between applicant and FE, be flown as a separate test.

2**.** An applicant should indicate to the FE the checks and duties carried out, including the identification of radio facilities. Checks should be completed in accordance with the authorised check list for the aeroplane on which the test is being taken. During pre-flight preparation for the test the applicant should be required to determine power settings and speeds. Performance data for take-off, approach and landing should be calculated by the applicant in compliance with the operations manual or flight manual for the aeroplane used.

FLIGHT TEST TOLERANCE

3**.** The applicant should demonstrate the ability to:

- operate the aeroplane within its limitations;
- complete all manoeuvres with smoothness and accuracy;
- exercise good judgment and airmanship;
- apply aeronautical knowledge; and
- maintain control of the aeroplane at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

4**.** The following limits are for general guidance. The FE should make allowance for turbulent conditions and the handling qualities and performance of the aeroplane used.

Height

normal flight	± 150 feet
-with simulated engine failure	± 200 feet **(if multi-engine aeroplane is used)**

Heading / Tracking of radio aids

normal flight	± 10°
with simulated engine failure	± 15° **(if multi-engine aeroplanes is used)**

Speed

take-off and approach	+15/–5 knots
all other flight regimes	± 15 knots

5**.** The skill test contents and sections set out in this AMC should be used for the skill test for the issue of a PPL(A) on single-engine **and multi-engine aeroplanes or on touring motor gliders**.

SECTION 1 PRE-FLIGHT OPERATIONS AND DEPARTURE	
Use of checklist, airmanship (control of aeroplane by external visual reference, anti/de-icing procedures, etc.) apply in all sections	
a	Pre-flight documentation**, NOTAM** and weather brief
b	Mass and balance and performance calculation
c	Aeroplane inspection and servicing
d	Engine starting and after starting procedures
e	Taxiing and aerodrome procedures, pre-take-off procedures
f	Take-off and after take-off checks
g	Aerodrome departure procedures
h	ATC liaison – compliance, R/T procedures
SECTION 2 GENERAL AIRWORK	
a	ATC liaison – compliance, R/T procedures
b	Straight and level flight, with speed changes
c	Climbing: i. Best rate of climb ii. Climbing turns iii. Levelling off
d	Medium (30° bank) turns
e	Steep (45° bank) turns (including recognition and recovery from a spiral dive)
f	Flight at critically low airspeed with and without flaps
g	Stalling: i. Clean stall and recover with power ii. Approach to stall descending turn with bank angle 20°, approach configuration iii. Approach to stall in landing configuration
h	Descending: i. With and without power ii. Descending turns (steep gliding turns) iii. Levelling off

SECTION 3 EN-ROUTE PROCEDURES	
a	Flight plan, dead reckoning and map reading
b	Maintenance of altitude, heading and speed
c	Orientation, timing and revision of ETAs, log keeping
d	Diversion to alternate aerodrome (planning and implementation)
e	Use of radio navigation aids
f	Basic instrument flying check (180° turn in simulated IMC)
g	Flight management (checks, fuel systems and carburettor icing, etc.)~~ ATC liaison – compliance, R/T procedures~~
h	**ATC liaison – compliance, R/T procedures**
SECTION 4 APPROACH AND LANDING PROCEDURES	
a	Aerodrome arrival procedures
b	* Precision landing (short field landing), cross wind, if suitable conditions available
c	* Flapless landing
d	* Approach to landing with idle power **(SINGLE-ENGINE ONLY)**
e	Touch and go
f	Go-around from low height
g	ATC liaison – compliance, R/T procedures
h	Actions after flight
SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES	
This section may be combined with Sections 1 through 4	
a	Simulated engine failure after take-off **(SINGLE-ENGINE ONLY)**
b	* Simulated forced landing **(SINGLE-ENGINE ONLY)**
c	Simulated precautionary landing **(SINGLE-ENGINE ONLY)**
d	Simulated emergencies
e	Oral questions

SECTION 6 SIMULATED ASYMMETRIC FLIGHT AND RELEVANT CLASS/TYPE ITEMS	
This section may be combined with Sections 1 through 5	
a	**Simulated engine failure during take-off (at a safe altitude unless carried out in a flight simulator)**
b	**Asymmetric approach and go-around**
c	**Asymmetric approach and full stop landing**
d	**Engine shutdown and restart**
e	**ATC liaison – compliance, R/T procedures, Airmanship**
f	**As determined by the Flight Examiner – any relevant items of the class/type rating skill test to include, if applicable:** **i. Aeroplane systems including handling of auto pilot** **ii. Operation of pressurisation system** **iii. Use of de-icing and anti-icing system**
g	**Oral questions**

* These items may be combined, at the discretion of the FE.

AMC No 2 to FCL. 235~~220~~
Contents of the skill test for the issue of a PPL(H)

1. The area and route to be flown should be chosen by the flight examiner (FE) and all low level and hover work should be at an adequate aerodrome/site. Routes used for section 3 may end at the aerodrome of departure or at another aerodrome. The applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board. The navigation section of the test, as set out in this AMC should consist of at least 3 legs, each leg of a minimum duration of 10 minutes. The skill test may be conducted in 2 flights.

2. An applicant should indicate to the FE the checks and duties carried out, including the identification of radio facilities. Checks should be completed in accordance with the authorised check list or pilot operating handbook for the helicopter on which the test is being taken. During pre-flight preparation for the test the applicant is required to determine power settings and speeds. Performance data for take-off, approach and landing should be calculated by the applicant in compliance with the operations manual or flight manual for the helicopter used.

FLIGHT TEST TOLERANCE

3. The applicant should demonstrate the ability to:

   - operate the helicopter within its limitations;
   - complete all manoeuvres with smoothness and accuracy;
   - exercise good judgement and airmanship;
   - apply aeronautical knowledge; and

– maintain control of the helicopter at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

4. The following limits are for general guidance. The FE should make allowance for turbulent conditions and the handling qualities and performance of the helicopter used.

Height	
normal forward flight	± 150 feet
with simulated major emergency	± 200 feet
hovering I.G.E. flight	± 2 feet
Heading / Tracking of radio aids	
normal flight	± 10°
with simulated major emergency	± 15°
Speed	
take-off approach	– 10 knots/+15 knots
all other flight regimes	± 15 knots
Ground drift	
T.O. hover I.G.E.	± 3 feet
landing	no sideways or backwards movement

CONTENT OF THE SKILL TEST

5. The skill test contents and sections set out in this AMC should be used for the skill test for the issue of a PPL(H) on single- or multi-engine helicopters.

SECTION 1 PRE-FLIGHT/POST-FLIGHT CHECKS AND PROCEDURES	
Use of checklist, airmanship, control of helicopter by external visual reference, anti-icing procedures, etc., apply in all sections	
a	Helicopter knowledge, (e.g. technical log, fuel, mass and balance, performance), Flight Planning, NOTAMS, Weather
b	Pre-flight inspection/action, location of parts and purpose
c	Cockpit inspection, Starting procedure
d	Communication and navigation equipment checks, selecting and setting frequencies

e	Pre-take-off procedure, R/T procedure, ATC liaison-compliance
f	Parking, Shutdown and Post-flight procedure
SECTION 2 HOVER MANOEUVRES, ADVANCED HANDLING AND CONFINED AREAS	
a	Take-off and landing (lift off and touch down)
b	Taxi, hover taxi
c	Stationary hover with head/cross/tail wind
d	Stationary hover turns, 360º left and right (spot turns)
e	Forward, sideways and backwards hover manoeuvring
f	Simulated engine failure from the hover
g	Quick stops into and downwind
h	Sloping ground/unprepared sites landings and take-offs
i	Take-offs (various profiles)
j	Crosswind, downwind take-off (if practicable)
k	Take-off at maximum take-off mass (actual or simulated)
l	Approaches (various profiles)
m	Limited power take-off and landing
n	Autorotations, (FE to select two items from - Basic, range, low speed, and 360º turns)
o	Autorotative landing
p	Practice forced landing with power recovery
q	Power checks, reconnaissance technique, approach and departure technique
SECTION 3 NAVIGATION - EN ROUTE PROCEDURES	
a	Navigation and orientation at various altitudes/heights, map reading
b	Altitude/height, speed, heading control, observation of airspace, altimeter setting
c	Monitoring of flight progress, flight –log, fuel usage, endurance, ETA, assessment of track -error and re-establishment of correct track, instrument monitoring

d	Observation of weather conditions, diversion planning
e	Use of navigation aids (where available)
f	ATC liaison and observance of regulations, etc.
SECTION 4 FLIGHT PROCEDURES AND MANOEUVRES	
a	Level flight, control of heading, altitude/height and speed
b	Climbing and descending turns to specified headings
c	Level turns with up to 30ºbank, 180º to 360º left and right
d	Level turns 180º left and right by sole reference to instruments
SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES (SIMULATED WHERE APPROPRIATE)	
Note (1) Where the test is conducted on a multi-engine helicopter a simulated engine failure drill, including a single engine approach and landing should be included in the test.	
Note (2) The FE should select 4 items from the following:	
a	Engine malfunctions, including governor failure, carburettor/engine icing, oil system, as appropriate
b	Fuel system malfunction
c	Electrical system malfunction
d	Hydraulic system malfunction, including approach and landing without hydraulics, as applicable
e	Main rotor and/or anti-torque system malfunction (flight simulator or discussion only)
f	Fire drills, including smoke control and removal, as applicable
g	Other abnormal and Emergency procedures as outlined in appropriate flight manual and with reference to Appendix 9 ~~B.1~~ **C** to Part-FCL, sections ~~7~~ **3** and ~~8~~**4**, including for multi-engine helicopters: - Simulated engine failure at take-off: ~~——~~- rejected take-off at or before TDP or safe forced landing at or before DPATO ~~——~~- shortly after TDP or DPATO - Landing with simulated engine failure: - landing or go-around following engine failure before LDP or DPBL - following engine failure after LDP or safe forced landing after DPBL

AMC No 3 to FCL.235

Content of the skill test for the issue of the PPL(As)

1. The area and route to be flown is chosen by the FE. Routes used for section 3 may end at the aerodrome of departure or at another aerodrome and one destination should be a controlled aerodrome. The skill test may be conducted in 2 flights. The total duration of the flight(s) should be at least 60 minutes.

2. The applicant should demonstrate the ability to:
   - operate the airship within its limitations;
   - complete all manoeuvres with smoothness and accuracy;
   - exercise good judgement and airmanship;
   - apply aeronautical knowledge; and
   - maintain control of the airship at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

FLIGHT TEST TOLERANCES

3. The following limits should apply, corrected to make allowance for turbulent conditions and the handling qualities and performance of the airship used.

Height	
normal flight	±200 feet
simulated major emergency	±300 feet
Tracking on radio aids	±15°
Heading	
normal flight	±15°
simulated major emergency	±20°

CONTENT OF THE TEST

4. Items in Sections 5 and 6 may be performed in an FNPT (A**s**~~S~~) or a flight simulator (As).

SECTION 1 PRE-FLIGHT OPERATIONS AND DEPARTURE	
Use of airship checklists, airmanship, control of airship by external visual reference, anti-icing procedures, and principles of threat and error management apply in all sections	
a	Pre-flight, including: Flight planning, Documentation, Mass and balance**,** ~~determination,~~ Weather **and NOTAM** briefing
b	Airship inspection and servicing
c	Off-mast procedure, ground manoeuvring and take-off
d	Performance considerations and trim

e	Aerodrome and traffic pattern operations
f	Departure procedure, altimeter setting, collision avoidance (lookout)
g	ATC liaison – compliance, R/T procedures
SECTION 2 GENERAL AIRWORK	
a	Control of the airship by external visual reference, including straight and level, climb, descent, lookout
b	Flight close to pressure height
c	Turns
d	Steep descents and climbs
e	Flight by reference solely to instruments, including: i. Level flight, control of heading, altitude and airspeed ii. Climbing and descending turns iii. Recoveries from unusual attitudes
f	ATC liaison – compliance, R/T procedures
SECTION 3 EN-ROUTE PROCEDURES	
a	Flight Plan, dead reckoning and map reading
b	Maintenance of altitude, heading and speed, collision avoidance (lookout procedures)
c	Orientation, timing and revision of ETAs, log keeping
d	Observation of weather conditions, diversion to alternate aerodrome (planning and implementation)
e	Use of radio navigation aids
f	Flight management (checks, fuel systems, etc.) ~~ATC liaison – compliance, R/T procedures~~
g	**ATC liaison – compliance, R/T procedures**
SECTION 4 APPROACH AND LANDING PROCEDURES	
a	Aerodrome arrival procedures, altimeter setting, checks, lookout
b	ATC liaison **-** compliance, R/T procedures
c	Go-around action

d	Normal landing
e	Short field landing
f	Post**-**flight actions
SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES	
This section may be combined with sections 1 through 4	
a	Simulated engine failure after take-off (at a safe altitude), fire drill
b	Equipment malfunctions
c	Forced landing (simulated)
d	ATC liaison **-** compliance, R/T procedures
e	Oral questions
SECTION 6 RELEVANT TYPE ITEMS	
This section may be combined with Sections 1 through 5	
a	Simulated engine failure during take-off (at a safe altitude unless carried out in a flight simulator)
b	**A**~~a~~pproach and go-around with failed engine(s)
c	**A**~~a~~pproach and full stop landing with failed engine(s)
d	Malfunctions in the envelope pressure system
e	ATC liaison – compliance, R/T procedures, Airmanship
f	As determined by the Flight Examiner – any relevant items of the type rating skill test to include, if applicable: i. Airship systems ii. Operation of envelope pressure system
g	Oral questions

AMC No 1 to FCL.210.A
FLIGHT INSTRUCTION FOR THE PRIVATE PILOT LICENCE - AEROPLANE

1. ENTRY TO TRAINING

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

2. FLIGHT INSTRUCTION

2.1 The PPL(A) flight instruction syllabus should take into account the principles of threat and error management and cover:

(a) pre-flight operations, including mass and balance determination, aircraft inspection and servicing;

(b) aerodrome and traffic pattern operations, collision avoidance precautions and procedures;

(c) control of the aircraft by external visual reference;

(d) flight at critically low airspeeds, recognition of, and recovery from, incipient and full stalls;

(e) flight at critically high airspeeds, recognition of, and recovery from, spiral dive;

(f) normal and crosswind take-offs and landings;

(g) maximum performance (short field and obstacle clearance) take-offs, short-field landings;

(h) flight by reference solely to instruments, including the completion of a level 180 degrees turn;

(i) cross-country flying using visual reference, dead reckoning and radio navigation aids;

(j) emergency operations, including simulated aeroplane equipment malfunctions; and

(k) operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures, communication procedures and phraseology.

2.2 Before allowing the applicant for a PPL(A) to undertake his/her first solo flight, the flight instructor should ensure that the applicant can use radiotelephony (R/T) communication

3. SYLLABUS OF FLIGHT INSTRUCTION

Exercise 1: Familiarisation with the aeroplane

- characteristics of the aeroplane
- cockpit layout
- systems
- check lists, drills, controls

Exercise 1E: Emergency drills

- action in the event of fire on the ground and in the air
- engine cabin and electrical system fire
- systems failure
- escape drills, location and use of emergency equipment and exits

Exercise 2: Preparation for and action after flight

- flight authorisation and aeroplane acceptance
- serviceability documents

- equipment required, maps, etc.
- external checks
- internal checks
- harness, seat or rudder panel adjustments
- starting and warm up checks
- power checks
- running down system checks and switching off the engine
- parking, security and picketing (e.g. tie down)
- completion of authorisation sheet and serviceability documents

Exercise 3: Air experience

- flight exercise

Exercise 4: Effects of controls

- primary effects when laterally level and when banked
- further effects of aileron and rudder
- effects of:
  - airspeed
  - slipstream
  - power
  - trimming controls
  - flaps
  - other controls, as applicable
- operation of:
  - mixture control
  - carburettor heat
  - cabin heating/ventilation
- airmanship

Exercise 5: Taxiing

- pre-taxi checks
- starting, control of speed and stopping
- engine handling
- control of direction and turning
- turning in confined spaces
- parking area procedure and precautions
- effects of wind and use of flying controls
- effects of ground surface
- freedom of rudder movement

- marshalling signals
- instrument checks
- air traffic control procedures
- airmanship

Exercise 5E: Emergencies

- Brake and steering failure

Exercise 6: Straight and level

- at normal cruising power, attaining and maintaining straight and level flight
- flight at critically high airspeeds
- demonstration of inherent stability
- control in pitch, including use of trim
- lateral level, direction and balance, trim
- at selected airspeeds (use of power)
- during speed and configuration changes
- use of instruments for precision
- airmanship

Exercise 7: Climbing

- entry, maintaining the normal and max rate climb, levelling off
- levelling off at selected altitudes
- en-route climb (cruise climb)
- climbing with flap down
- recovery to normal climb
- maximum angle of climb
- use of instruments for precision
- airmanship

Exercise 8: Descending

- entry, maintaining and levelling off
- levelling off at selected altitudes
- glide, powered and cruise descent (including effect of power and airspeed)
- side slipping (on suitable types)
- use of instruments for precision flight
- airmanship

Exercise 9: Turning

- entry and maintaining medium level turns
- resuming straight flight

- faults in the turn – (in correct pitch, bank, balance)
- climbing turns
- descending turns
- faults in the turns (slipping/skidding on suitable types)

– turns onto selected headings, use of gyro heading indicator and compass

- use of instruments for precision
- airmanship

Exercise 10A: Slow flight

NOTE: The objective is to improve the student's ability to recognise inadvertent flight at critically low speeds and provide practice in maintaining the aeroplane in balance while returning to normal airspeed.

- safety checks
- introduction to slow flight
- controlled flight down to critically slow airspeed
- application of full power with correct attitude and balance to achieve normal climb speed
- airmanship

Exercise 10B: Stalling

- airmanship
- safety checks
- symptoms
- recognition
- clean stall and recovery without power and with power
- recovery when a wing drops
- approach to stall in the approach and in the landing configurations, with and without power, recovery at the incipient stage

Exercise 11: Spin avoidance

- airmanship
- safety checks
- stalling and recovery at the incipient spin stage (stall with excessive wing drop, about 45°)
- instructor induced distractions during the stall

NOTE 1: At least two hours of stall awareness and spin avoidance flight training should be completed during the course.

NOTE 2: Consideration of manoeuvre limitations and the need to refer to the aeroplane manual and mass and balance calculations.

Exercise 12: Take-off and climb to downwind position

- pre-take-off checks

– into wind take-off

– safeguarding the nosewheel

– crosswind take-off

– drills during and after take-off

– short take-off and soft field procedure/techniques including performance calculations

– noise abatement procedures

– airmanship

Exercise 13: Circuit, approach and landing

– circuit procedures, downwind, base leg

– powered approach and landing

– safeguarding the nosewheel

– effect of wind on approach and touchdown speeds, use of flaps

– crosswind approach and landing

– glide approach and landing

– short landing and soft field procedures/techniques

– flapless approach and landing

– wheel landing (tail wheel aeroplanes)

– missed approach/go around

– noise abatement procedures

– airmanship

Exercise 12/13E: Emergencies

– abandoned take-off

– engine failure after take-off

– mislanding/go-around

– missed approach

In the interests of safety it will be necessary for pilots trained on nose wheel aeroplanes to undergo dual conversion training before flying tail wheel aeroplanes, and vice-versa.

Exercise 14: First solo

– instructor's briefing, observation of flight and de-briefing

NOTE: During flights immediately following the solo circuit consolidation the following should be revised.

– procedures for leaving and rejoining the circuit

– the local area, restrictions, map reading

– use of radio aids for homing

– turns using magnetic compass, compass errors

- airmanship

Exercise 15: Advanced turning

- steep turns (45°), level and descending
- stalling in the turn and recovery
- recoveries from unusual attitudes, including spiral dives
- airmanship

Exercise 16: Forced landing without power

- forced landing procedure
- choice of landing area, provision for change of plan
- gliding distance
- descent plan
- key positions
- engine cooling
- engine failure checks
- use of radio
- base leg
- final approach
- landing
- actions after landing
- airmanship

Exercise 17: Precautionary landing

- full procedure away from aerodrome to break-off height
- occasions necessitating
- in-flight conditions
- landing area selection
  - normal aerodrome
  - disused aerodrome
  - ordinary field
- circuit and approach
- actions after landing
- airmanship

Exercise 18A: Navigation

Flight planning

- weather forecast and actuals
- map selection and preparation
  - choice of route

    - controlled airspace
    - danger, prohibited and restricted areas
    - safety altitudes
  - calculations
    - magnetic heading(s) and time(s) en-route
    - fuel consumption
    - mass and balance
    - mass and performance
  - flight information
    - NOTAMS etc.
    - radio frequencies
    - selection of alternate aerodromes
  - aeroplane documentation
  - notification of the flight
    - pre-flight administrative procedures
    - flight plan form

Departure

  - organisation of cockpit workload
  - departure procedures
    - altimeter settings
    - ATC liaison in controlled/regulated airspace
    - setting heading procedure
    - noting of ETAs
  - maintenance of altitude and heading
  - revisions of ETA and heading
  - log keeping
  - use of radio
  - use of navaids
  - minimum weather conditions for continuation of flight
  - in-flight decisions
  - transiting controlled/regulated airspace
  - diversion procedures
  - uncertainty of position procedure
  - lost procedure

Arrival, aerodrome joining procedure

    - ATC liaison in controlled/regulated airspace

  - altimeter setting
  - entering the traffic pattern
  - circuit procedures
- parking
- security of aeroplane
- refuelling
- closing of flight plan, if appropriate
- post-flight administrative procedures

Exercise 18B: Navigation problems at lower levels and in reduced visibility

- actions prior to descending
- hazards (e.g. obstacles, and terrain)
- difficulties of map reading
- effects of wind and turbulence
- vertical situational awareness (avoidance of controlled flight into terrain)
- avoidance of noise sensitive areas
- joining the circuit
- bad weather circuit and landing

Exercise 18C: Radio navigation

Use of Global Navigation Satellite Systems

- **selection of waypoints**
- **to / from indications, orientation**
- **error messages**

Use of VHF Omni Range

- availability, AIP, frequencies
- selection and identification
- omni bearing selector (OBS)
- to/from indications, orientation
- course deviation indicator (CDI)
- determination of radial
- intercepting and maintaining a radial
- VOR passage
- obtaining a fix from two VORs

Use of automatic direction finding equipment (ADF) – non-directional beacons (NDBs)

- availability, AIP, frequencies
- selection and identification

- orientation relative to the beacon
- homing

Use of VHF direction finding (VHF/DF)

- availability, AIP, frequencies
- R/T procedures and ATC liaison
- obtaining a QDM and homing

Use of en-route/terminal radar

- availability, AIP
- procedures and ATC liaison
- pilot's responsibilities
- secondary surveillance radar
  - transponders
  - code selection
  - interrogation and reply

Use of distance measuring equipment (DME)

- station selection and identification
- modes of operation
  - distance, groundspeed, time to run

Exercise 19: Basic instrument flight

- physiological sensations
- instrument appreciation
  - attitude instrument flight
- instrument limitations
- airmanship
- basic manoeuvres
  - straight and level at various airspeeds and configurations
  - climbing and descending
  - standard rate turns, climbing and descending, onto selected headings
  - recoveries from climbing and descending turns

4. BASIC INSTRUMENT TRAINING DEVICES (BITD)

4.1 A BITD may be used for flight training for:

- flight by reference solely to instruments;
- navigation using radio navigation aids; and
- basic instrument flight

The use of the BITD should be subject to the following:

– the training should be complemented by exercises on an aeroplane;

– the record of the parameters of the flight must be available; and

– A FI(A) or STI(A) should conduct the instruction

AMC No 1 to FCL.210.H
FLIGHT INSTRUCTION FOR THE PRIVATE PILOT LICENCE (HELICOPTER)

1. ENTRY TO TRAINING

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

2. FLIGHT INSTRUCTION

    2.1 The PPL(H) flight instruction syllabus should take into account the principles of threat and error management and cover:

    (a) pre-flight operations, including mass and balance determination, helicopter inspection and servicing;

    (b) aerodrome and traffic pattern operations, collision avoidance precautions and procedures;

    (c) control of the helicopter by external visual reference;

    (d) take-offs, landings, hovering, look out turns and normal transitions from and to the hover;

    (e) emergency procedures, basic autorotations, simulated engine failure, ground resonance recovery if relevant to type;

    (f) sideways and backwards flight, turns on the spot;

    (g) incipient vortex ring recognition and recovery;

    (h) touchdown autorotations, simulated engine-off landings, practice forced landings. Simulated equipment malfunctions and emergency procedures relating to malfunctions of engines, controls, electrical and hydraulic circuits;

    (i) steep turns;

    (j) transitions, quick stops, out of wind manoeuvres, sloping ground landings and take-offs;

    (k) limited power and confined area operations including selection of and operations to and from unprepared sites;

    (l) flight by sole reference to basic flight instruments including completion of a level 180° turn and recovery from unusual attitudes to simulate inadvertent entry into cloud (this training may be conducted by an FI(H));

    (m) cross-country flying by using visual reference, dead reckoning and, where available, radio navigation aids;

    (n) operations to, from and transiting controlled aerodromes; compliance with air traffic services procedures, communication procedures and phraseology;

2.2 Before allowing the applicant for a PPL(H) to undertake his/her first solo flight, the flight instructor should ensure that the applicant can use radiotelephony (R/T) communication

3. SYLLABUS OF FLIGHT INSTRUCTION

NOTE : Airmanship should be included as required in each exercise

Exercise 1a: Familiarisation with the helicopter

- characteristics of the helicopter, external features
- cockpit layout
- systems
- check lists, procedures, controls

Exercise 1b: Emergency procedures

- action in the event of fire on the ground and in the air
- engine, cabin and electrical system fire
- systems failures
- escape drills, location and use of emergency equipment and exits

Exercise 2: Preparation for and action after flight

- flight authorisation and helicopter acceptance
- serviceability documents
- equipment required, maps, etc.
- external checks
- internal checks
- seat, harness and flight controls adjustments
- starting and warm up checks clutch engagement, starting rotors
- power checks
- running down system checks and switching off the engine
- parking, security and picketing
- completion of authorisation sheet and serviceability documents

Exercise 3: Air experience

- to introduce the student to rotary wing flight
- flight exercise

Exercise 4: Effects of controls

- function of flight controls, primary and secondary effect
- effect of airspeed
- effect of power changes (torque)
- effect of yaw (sideslip)
- effect of disc loading (bank and flare)

- effect on controls of selecting hydraulics on/off
- effect of control friction
- instruments
- use of carburettor heat/anti-icing control

Exercise 5: Power and attitude changes

- relationship between cyclic control position, disc attitude, fuselage attitude, airspeed
- flapback
- power required diagram in relation to airspeed
- power and airspeed changes in level flight
- use of instruments for precision
- engine and airspeed limitations

Exercise 6a: Straight and level

- at normal cruising power, attaining and maintaining straight and level flight
- control in pitch, including use of control friction and/or trim
- maintaining direction and balance, (ball/yawstring use)
- setting power for selected airspeeds/speed changes
- use of instruments for precision

Exercise 6b: Climbing

- optimum climb speed, best angle/rate of climb from power required diagram
- initiation, maintaining the normal and maximum rate of climb, levelling off
- levelling off at selected altitudes/heights
- use of instruments for precision

Exercise 6c: Descending

- optimum descent speed, best angle/rate of descent from power required diagram
- initiation, maintaining and levelling off
- levelling off at selected altitudes/heights
- descent (including effect of power and airspeed)
- use of instruments for precision

Exercise 6d: Turning

- initiation and maintaining medium level turns
- resuming straight flight
- altitude, bank and co-ordination

- climbing and descending turns and effect on rate of climb/descent
- turns onto selected headings, use of gyro heading indicator and compass
- use of instruments for precision

Exercise 7: Basic autorotation

- safety checks, verbal warning, lookout
- entry, development and characteristics
- control of airspeed and RRPM, rotor and engine limitations
- effect of AUM, IAS, disc loading, G forces and density altitude
- re-engagement and go around procedures (throttle over-ride/ERPM control)
- vortex condition during recovery
- gentle/medium turns in autorotation
- demonstration of variable flare simulated engine off landing

Exercise 8a: Hovering

- demonstrate hover I.G.E, importance of wind effect and attitude, ground cushion, stability in the hover, effects of over controlling
- student holding cyclic stick only
- student handling collective lever (and throttle) only
- student handling collective lever, (throttle) and pedals
- student handling all controls
- demonstration of ground effect
- demonstration of wind effect
- demonstrate gentle forward running touchdown
- specific hazards e.g. snow, dust, litter

Exercise 8b: Hover taxiing, spot turns

- revise hovering
- precise ground speed/height control
- effect of wind direction on helicopter attitude and control margin
- control, co-ordination during spot turns
- carefully introduce gentle forward running touchdown

Exercise 8C: Hovering, taxiing emergencies

- revise hovering and gentle forward running touchdown, explain (demonstrate where applicable) effect of hydraulics failure in the hover
- demonstrate simulated engine failure in the hover and hover taxi
- demonstrate dangers of mishandling and over-pitching

Exercise 9: Take-off and landing

- pre-take off checks/drills
- lookout
- lifting to hover
- after take-off checks
- danger of horizontal movement near ground
- danger of mishandling and overpitching
- landing (without sideways or backwards movement)
- after landing checks/drills
- take-off and landing cross wind, downwind

Exercise 10: Transitions from hover to climb and approach to hover

- lookout
- revise take-off and landing
- ground effect, translational lift and its effects
- flapback and its effects
- effect of wind speed/direction during transitions from/to the hover
- the constant angle approach
- demonstration of variable flare simulated engine off landing

Exercise 11a: Circuit, approach and landing

- revise transitions from hover to climb and approach to hover
- circuit procedures, downwind, base leg
- approach and landing with power
- pre-landing checks
- effect of wind on approach and I.G.E. hover
- crosswind approach and landing
- go around
- noise abatement procedures

Exercise 11b: Steep and limited power approaches and landings

- revise the constant angle approach
- the steep approach (explain danger of high sink rate and low air speed)
- limited power approach (explain danger of high speed at touch down)
- use of the ground effect
- variable flare simulated engine off landing

Exercise 11c: Emergency procedures

- abandoned take-off
- missed approach/go-around
- hydraulic OFF landing, (if applicable)
- tail rotor control or tail rotor drive failure (briefing only)
- simulated emergencies in the circuit to include:
- hydraulics failure
- simulated engine failure on take-off, cross wind, downwind and baseleg
- governor failure

Exercise 12: First solo

- instructor’s briefing, observation of flight and debriefing
- warn of change of attitude from reduced and laterally displaced weight
- warn of low tail, low skid/wheel during hover, landing
- warn of dangers of loss of RRPM and overpitching
- pre take-off checks
- into wind take-off
- procedures during and after take-off
- normal circuit, approaches and landings
- action in the event of an Emergency

Exercise 13: Sideways and backwards hover manoeuvring

- manoeuvring sideways flight heading into wind
- manoeuvring backwards flight heading into wind
- combination of sideways and backwards manoeuvring
- manoeuvring sideways and backwards, heading out of wind
- stability, weathercocking
- recovery from backwards manoeuvring, (pitch nose down)
- groundspeed limitations for sideways and backwards manoeuvring

Exercise 14: Spot turns

- revise hovering into wind and downwind
- turn on spot through 360º:
  - around pilots position
  - around tail rotor
  - around helicopter geometric centre
  - square, safe visibility clearing turn
- rotor RPM control, torque effect, cyclic limiting stops due to C of G position and wind speed/direction

Exercise 15: Hover out of ground effect (OGE), vortex ring

- establishing hover O.G.E
- drift/height/power control
- demonstration of incipient stage of vortex ring, recognition and recovery (from a safe altitude)
- loss of tail rotor effectiveness

Exercise 16: Simulated engine off landings (EOL)

- the effect of weight, disc loading, density attitude, RRPM decay
- revise basic autorotation entry
- optimum use of cyclic and collective to control speed/RRPM
- variable flare simulated EOL
- demonstrate constant attitude simulated EOL
- demonstrate simulated EOL from hover/hover taxi
- demonstrate simulated EOL from transition and low level

Exercise 17: Advanced autorotation

- over a selected point at various height and speed
- revise basic autorotation - note ground distance covered
- range autorotation
- low speed autorotation
- constant attitude autorotation (terminate at safe altitude)
- 'S' turns
- turns through 180° and 360°
- effects on angles of descent, IAS, RRPM and effect of AUM

Exercise 18: Practice forced landings

- procedure and choice of the forced landing area
- forced landing checks and crash action
- re-engagement and go-around procedures

Exercise 19: Steep turns

- steep (level) turns (30° bank)
- maximum rate turns (45° bank if possible)
- steep autorotative turns
- faults in the turn - balance, attitude, bank and co-ordination
- RRPM control, disc loading
- vibration and control feedback
- effect of wind at low level

Exercise 20: Transitions

- revise ground effect, translational lift, flapback
- maintaining constant height, (20-30 feet AGL):
- transition from hover to minimum 50 knots IAS and back to hover
- demonstrate effect of wind

Exercise 21: Quickstops

- use of power and controls
- effect of wind
- quickstops into wind
- quickstops from crosswind and downwind terminating into wind
- danger of vortex ring
- danger of high disc loading

Exercise 22a: Navigation

Flight planning

- weather forecast and actuals
- map selection and preparation and use
- choice of route
  - controlled airspace, danger and prohibited areas
  - safety altitudes and noise abatement considerations
- calculations
  - magnetic heading(s) and time(s) en-route
  - fuel consumption
  - mass and balance
- flight information
  - NOTAMs etc
  - radio frequencies
  - selection of alternate landing sites
- helicopter documentation
- notification of the flight
  - pre-flight administrative procedures
  - flight plan form (where appropriate)

Departure

- organisation of cockpit workload
- departure procedures
  - altimeter settings
  - ATC liaison in controlled/regulated airspace
  - setting heading procedure

- noting of ETAs
- maintenance of height/altitude and heading
- revisions of ETA and heading
  - 10º line, double track and track error, closing angle
  - 1 in 60 rule
  - amending an ETA
- log keeping
- use of radio
- use of navaids (if fitted)
- minimum weather conditions for continuation of flight
- in-flight decisions
- transiting controlled/regulated airspace
- uncertainty of position procedure
- lost procedure

Arrival, aerodrome joining procedure

  - ATC liaison in controlled/regulated airspace
  - altimeter setting
  - entering the traffic pattern
  - circuit procedures
- parking
- security of helicopter
- refuelling
- closing of flight plan, (if appropriate)
- post-flight administrative procedures

Exercise 22b: Navigation problems at low heights and in reduced visibility

- actions prior to descending
- hazards (e.g. obstacles, other aircraft)
- difficulties of map reading
- effects of wind and turbulence
- avoidance of noise sensitive areas
- joining the circuit
- bad weather circuit and landing
- appropriate procedures and choice of landing area

Exercise 22c: Radio navigation

Use of Global Navigation Satellite Systems

  - selection of waypoints

- to/from indications, orientation
- error messages

Use of VHF Omni Range

- availability, AIP, frequencies
- selection and identification
- omni bearing selector (OBS)
- to/from indications, orientation
- course deviation indicator (CDI)
- determination of radial
- intercepting and maintaining a radial
- VOR passage
- obtaining a fix from two VORs

Use of automatic direction finding equipment (ADF)/non directional beacons (NDBs)

- availability, AIP, frequencies
- selection and identification
- orientation relative to the beacon
- homing

Use of VHF direction finding (VHF/DF)

- availability, AIP, frequencies
- RTF procedures and ATC liaison
- obtaining a QDM and homin g

Use of en-route/terminal radar

- availability, AIP
- procedures and ATC liaison
- pilots responsibilities
- secondary surveillance radar (if transponder fitted)
  - transponders
  - code selection
  - interrogation and reply

Use of distance measuring equipment (DME)

- station selection and identification
- modes of operation
  - distance, groundspeed, time to run

Exercise 23: Advanced take-off, landings, transitions

- landing and take-off out of wind (performance reduction)

- ground effect, translational lift and directional stability variation when out of wind
- downwind transitions
- vertical takeoff over obstacles
- running take-off
- cushion creep take off
- reconnaissance of landing site
- running landing
- zero speed landing
- cross wind and downwind landings
- steep approach
- go-around

Exercise 24: Sloping ground

- limitations, assessing slope angle
- wind and slope relationship - blade and control stops
- effect of C of G when on slope
- ground effect on slope, power required
- right skid up slope
- left skid up slope
- nose up slope
- avoidance of dynamic roll over, dangers of soft ground and sideways movement on touchdown
- danger of striking main/tail rotor by harsh control movement near ground

Exercise 25: Limited power

- take-off power check
- vertical take-off over obstacles
- in flight power check
- running landing
- zero speed landing
- approach to low hover
- approach to hover
- approach to hover OGE
- steep approach
- go-around

Exercise 26: Confined areas

- landing capability, performance assessment

- locating landing site, assessing wind speed/direction
- reconnaissance of landing site
- select markers
- select direction and type of approach
- circuit
- approach to committed point and go around
- approach
- clearing turn
- landing
- power check, performance assessment in and out of ground effect
- normal take-off to best angle of climb speed
- vertical take-off from hover

Exercise 27: Basic instrument flight

- physiological sensations
- instrument appreciation
  - attitude instrument flight
  - instrument scan
- instrument limitations
- basic manoeuvres
  - straight and level at various airspeeds and configurations
  - climbing and descending
  - standard rate turns, climbing and descending, onto selected headings
- recoveries from climbing and descending turns
- recoveries from unusual attitudes

Exercise 28a: Night flying (if night rating required)

- pre-flight inspection using torch, pan lights, etc.
- take-off (no sideways or backwards manoeuvring)
- hover taxi (higher and slower than by day)
- transition to climb
- level flight
- approach and transition to hover
- landing
- autorotation
- practice forced landing (with flares if appropriate - simulated)
- night Emergencies (e.g. failure of lights, etc.)

Exercise 28b: Night cross country (if night rating required)

- nav principles as for day cross country
- map marking (highlighting built up areas with thicker lines, etc.)

AMC No 1 to FCL.210.As

FLIGHT INSTRUCTION FOR THE PRIVATE PILOT LICENCE - AIRSHIPS

1. ENTRY TO TRAINING

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

2. FLIGHT INSTRUCTION

2.1 The PPL(AS) flight instruction syllabus should take into account the principles of threat and error management and cover:

(a) Pre-flight operations, including mass and balance determination, airship inspection and servicing;

(b) ground manoeuvring, masting / **un**~~off~~masting procedures

(c) aerodrome and traffic pattern operations, collision avoidance precautions and procedures;

(d) control of the airship by external visual reference;

(e) take-offs and landings;

(f) flight by reference solely to instruments, including the completion of a level 180 degrees turn;

(g) cross-country flying using visual reference, dead reckoning and radio navigation aids;

(h) emergency operations, including simulated airship equipment malfunctions; and

(i) operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures, communication procedures and phraseology.

2.2 Before allowing the applicant for a PPL(AS) to undertake his/her first solo flight, the flight instructor should ensure that the applicant can use radiotelephony (R/T) communication.

3. SYLLABUS OF FLIGHT INSTRUCTION

Exercise 1: Familiarisation with the airship

- characteristics of the airship
- cockpit layout
- systems
- check lists, drills, controls

Exercise 1E: Emergency drills

- action in the event of fire on the ground and in the air

- engine cabin and electrical system fire
- systems failure
- escape drills, location and use of emergency equipment and exits

Exercise 2: Preparation for and action after flight

- flight authorisation and airship acceptance
- serviceability documents
- equipment required, maps, etc.
- mass and balance
- external checks
- ground crew briefing
- internal checks
- harness, seat or rudder panel adjustments
- starting and warm up checks
- power checks
- running down system checks and switching off the engine
- parking, security and masting
- completion of authorisation sheet and serviceability documents

Exercise 3: Air experience

- flight exercise

Exercise 4: Effects of controls

- primary effects
- further effects
- effects of:
  - airspeed
  - power
  - trimming controls
  - other controls, as applicable
- operation of:
  - mixture control
  - carburettor heat
  - cabin heating/ventilation
- airmanship

Exercise 5: Ground manoeuvring

- pre-taxi checks
- starting, control of speed and stopping
- engine handling

- Masting procedures
- control of direction and turning
- effects of wind
- effects of ground surface
- marshalling signals
- instrument checks
- air traffic control procedures
- airmanship / Emergencies

Exercise 6: Take off procedures

- Pre take off checks
- take off with different static heaviness
- drills during and after take-off
- noise abatement procedures
- airmanship

Exercise 6E: Emergencies

- abandoned take-off
- engine failure after take-off
- malfunctions of thrust vector control
- aerodynamic control failures
- electrical and system failures

Exercise 7: Climbing

- entry, maintaining the normal and max rate climb, levelling off
- levelling off at selected altitudes
- maximum angle of climb
- maximum rate of climb
- airmanship

Exercise 8: Straight and level

- attaining and maintaining straight and level flight
- flight at or close to pressure height
- control in pitch, including use of trim
- at selected airspeeds (use of power)
- during speed changes
- use of instruments for precision
- airmanship

Exercise 9: Descending

- entry, maintaining and levelling off

- levelling off at selected altitudes
- maximum rate of descent
- maximum angle of descent
- use of instruments for precision flight
- airmanship

Exercise 10: Turning

- entry and maintaining level turns
- resuming straight flight
- faults in the turn
- climbing turns
- descending turns
- turns onto selected headings, use of gyro heading indicator and compass
- use of instruments for precision
- airmanship

Exercise 11: Hovering

- Hovering manoeuvres (as applicable)
- airmanship

Exercise 12: Approach and landing

- effect of wind on approach and touchdown speeds
- landing with different static heaviness
- missed approach/go around procedures
- noise abatement procedures
- airmanship

Exercise 12E: Emergencies

- aborted approach / go around
- malfunction of thrust vector control
- envelope emergencies
- fire emergencies
- aerodynamic control failures
- electrical and system failures

Exercise 13: Precautionary landing

- occasions necessitating
- in-flight conditions
- landing area selection
- circuit and approach

- actions after landing
- airmanship

Exercise 14A: Navigation

Flight planning

- weather forecast and actuals
- map selection and preparation
  - choice of route
  - airspace structure
  - sensitive areas
  - safety altitudes
- calculations
  - magnetic heading(s) and time(s) en-route
  - fuel consumption
  - mass and balance
  - performance
- flight information
  - NOTAMS etc.
  - radio frequencies
  - selection of alternate aerodromes
- airship documentation
- notification of the flight
  - pre-flight administrative procedures
  - flight plan form

Departure

- organisation of cockpit workload
- departure procedures
  - altimeter settings
  - ATC liaison in controlled/regulated airspace
  - setting heading procedure
  - noting of ETAs
- maintenance of altitude and heading
- revisions of ETA and heading
- log keeping
- use of radio
- use of navaids
- minimum weather conditions for continuation of flight

- in-flight decisions
- transiting controlled/regulated airspace
- diversion procedures
- uncertainty of position procedure
- lost procedure

Arrival, aerodrome joining procedure

  - ATC liaison in controlled/regulated airspace
  - altimeter setting
  - entering the traffic pattern
  - circuit procedures

- parking / on masting
- security of airship
- refuelling
- closing of flight plan, if appropriate
- post-flight administrative procedures

Exercise 14B: Navigation problems at lower levels and in reduced visibility

- actions prior to descending
- hazards (e.g. obstacles, and terrain)
- difficulties of map reading
- effects of winds, turbulence and precipitation
- vertical situational awareness
- avoidance of noise sensitive areas
- joining the circuit
- bad weather circuit and landing

Exercise 14C: Radio navigation

Use of Global Navigation Satellite Systems

- **selection of waypoints**
- **to / from indications, orientation**
- **error messages**

Use of VHF Omni Range (if applicable)

- availability, AIP, frequencies
- selection and identification
- omni bearing selector (OBS)
- to/from indications, orientation
- course deviation indicator (CDI)
- determination of radial

- intercepting and maintaining a radial
- VOR passage
- obtaining a fix from two VORs

Use of automatic direction finding equipment (ADF) – non-directional beacons (NDBs) (if applicable)

- availability, AIP, frequencies
- selection and identification
- orientation relative to the beacon
- homing

Use of VHF direction finding (VHF/DF)

- availability, AIP, frequencies
- R/T procedures and ATC liaison
- obtaining a QDM and homing

Use of en-route/terminal radar

- availability, AIP
- procedures and ATC liaison
- pilot's responsibilities
- secondary surveillance radar
  - transponders
  - code selection
  - interrogation and reply

Use of distance measuring equipment (DME) (if applicable)

- station selection and identification
- modes of operation
  - distance, groundspeed, time to run

Exercise 15: Basic instrument flight

- physiological sensations
- instrument appreciation
  - attitude instrument flight
- instrument limitations
- airmanship
- basic manoeuvres
  - straight and level
  - climbing and descending
  - turns, climbing and descending, onto selected headings
  - recoveries from climbing and descending turns

4. BASIC INSTRUMENT TRAINING DEVICES (BITD)

4.1 A BITD may be used for flight training for:

– flight by reference solely to instruments;

– navigation using radio navigation aids; and

– basic instrument flight

4.2 The use of the BITD should be subject to the following:

– the training should be complemented by exercises on an airship;

– the record of the parameters of the flight must be available; and
a FI(AS) should conduct the instruction

AMC No1 to FCL.205.S (b~~c~~)

Contents of the proficiency check for the extension of SPL privileges to exercise commercial privileges on a glider

1. The applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board.

2. An applicant should indicate to the FE the checks and duties carried out. Checks should be completed in accordance with the authorised check list for the sailplane on which the test is being taken.

FLIGHT TEST TOLERANCE

3. The applicant should demonstrate the ability to:

– operate the sailplane within its limitations;

– complete all manoeuvres with smoothness and accuracy;

– exercise good judgment and airmanship;

– apply aeronautical knowledge; and

– maintain control of the sailplane at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

4. The applicant should demonstrate his / her skill in at least the winch or aerotow method of launching.

SECTION 1 PRE-FLIGHT OPERATIONS AND DEPARTURE	
Use of checklist, airmanship (control of sailplane by external visual reference), lookout, apply in all sections.	
a	Pre-flight sailplane (daily) inspection, documentation~~, and~~ weather **and NOTAM** brief
b	Verifying in-limits mass and balance and performance calculation
c	Passenger briefing
d	Sailplane servicing compliance

e	Pre-take-off checks
SECTION 2 LAUNCH METHOD **Note: At least for one of the three launch methods all the mentioned items are fully exercised during the skill test.**	
SECTION 2 (A) WINCH OR CAR LAUNCH	
a	Signals before and during launch, including messages to winch driver
b	Initial roll, take-off climb
c	Adequate profile of winch launch
d	Launch failures (simulated)
e	Situational awareness
SECTION 2 (B) AEROTOW LAUNCH	
a	Signals before and during launch, including signals to / communications with tow plane pilot for any problems
b	Initial roll, take-off climb
c	Launch abandonment (simulation only or 'talk-through')
d	Correct positioning during straight flight and turns
e	Out of position and recovery
f	Correct release from tow
g	Lookout and airmanship through whole launch phase
SECTION 2 (C) SELF LAUNCH (TMGs excluded~~SLS only~~)	
a	ATC liaison – compliance
b	Aerodrome departure procedures
c	Initial roll, take-off climb
d	Simulated engine failure after take off
e	Engine shut down and stowage
f	Lookout and airmanship through whole launch phase
SECTION 3 GENERAL AIRWORK	
a	Maintain straight ~~and level~~ flight; attitude and speed control
b	**Steep**~~Co-ordinated medium~~ (**45**~~30~~° bank) turns, look out procedures and collision avoidance
c	Turning on to selected headings visually and with use of compass

d	Flight at high angle of attack (critically low airspeed)
e	Clean stall and recovery
f	Spin avoidance and recovery
g	**Local area navigation and awareness**
SECTION 4 CIRCUIT, APPROACH AND LANDING	
a	Aerodrome circuit joining procedure
b	Collision avoidance - look out procedures
c	Pre-landing checks
d	Circuit, approach control, landing
e	Precision landing (simulation of out-landing - short field)
f	Cross wind landing if suitable conditions available

AMC No 1 to FCL.205.B (c)

Contents of the proficiency check for extension of the BPL privileges to exercise commercial privileges

1. The take off site should be chosen by the applicant depending on the actual meteorological conditions, the area which has to be over flown and the possible options for suitable landing sites. The applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board. The proficiency check may be conducted in 2 flights. The total duration of the flight(s) should be at least 60 minutes
2. An applicant should indicate to the FE the checks and duties carried out. Checks should be completed in accordance with the Flight Manual and/or the authorised check list for the balloon on which the test is being taken. During pre-flight preparation for the test the applicant should be required to perform crew and passenger briefings and demonstrate crowd control. The load calculation should be performed by the applicant in compliance with the operations manual or flight manual for the balloon used.

FLIGHT TEST TOLERANCE

3. The applicant should demonstrate the ability to:
   - operate the balloon within its limitations;
   - complete all manoeuvres with smoothness and accuracy
   - exercise good judgment and airmanship;
   - apply aeronautical knowledge; and
   - maintain control of the balloon at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

4. The following limits are for general guidance. The FE should make allowance for turbulent conditions and the handling qualities and performance of the hot air balloon used.

Height

normal flight	± 100 feet
with simulated emergency	± 150 feet

5. The contents and sections of the proficiency check set out in this AMC should be used for the extension of BPL privileges to exercise commercial privileges (HOT AIR BALLOON).

SECTION 1 PRE-FLIGHT OPERATIONS, INFLATION AND TAKE-OFF	
Use of checklist, airmanship, control of balloon by external visual reference, look out procedures, etc. apply in all sections.	
a	Pre-flight documentation, flight planning**,** ~~and~~ weather **and NOTAM** brief
b	Balloon inspection and servicing
c	Load calculation
d	Crowd control and crew briefing
e	Passenger briefing
f	Assembly and layout
g	Inflation and pre-take-off procedures
h	Take-off
i	ATC liaison – compliance
SECTION 2 GENERAL AIRWORK	
a	Climb to level flight
b	Level flight
c	Descent to level flight
d	Operating at low level
e	ATC liaison – compliance
SECTION 3 EN-ROUTE PROCEDURES	
a	Dead reckoning and map reading
b	Marking positions and time

c	Orientation, airspace structure
d	Maintenance of altitude
e	Fuel management
f	Communication with retrieve crew
g	ATC liaison – compliance / R/T communication
SECTION 4 APPROACH AND LANDING PROCEDURES	
a	Approach from low level, missed approach/fly on
b	Approach from high level, missed approach/fly on
c	Passenger pre-landing briefing
d	Pre-landing checks
e	Selection of landing field
f	Landing, dragging and deflation
g	ATC liaison – compliance /R/T communication
h	Actions after flight
SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES	
This section may be combined with Sections 1 through 6	
a	Simulated Fire on the ground and in the air
b	Simulated pilot light– and burner failures
c	Simulated passenger health problems
d	Other abnormal and emergency procedures as outlined in the appropriate flight manual
e	Oral questions
~~**SECTION 6 TETHERED FLIGHT**~~	
~~This section may be combined with Section 1~~	
~~a~~	~~Pre-flight documentation, flight planning and weather brief~~
~~b~~	~~Balloon inspection and servicing~~
~~c~~	~~Load calculation~~

~~d~~	~~Crowd control, crew and passenger briefings~~
~~e~~	~~Assembly and layout~~
~~f~~	~~Tether points and ropes~~
~~g~~	~~Inflation and pre-take-off procedures~~
~~h~~	~~Tethered flight~~
~~i~~	~~Fuel management~~
~~j~~	~~Descent to land~~
~~k~~	~~Actions after flight~~

6. The contents and sections of the proficiency check set out in this AMC should be used for the ~~for~~ extension of BPL privileges to exercise commercial privileges (GAS BALLOON).

SECTION 1 PRE-FLIGHT OPERATIONS, INFLATION AND TAKE-OFF	
Use of checklist, airmanship, control of balloon by external visual reference, look out procedures, etc. apply in all sections.	
a	Pre-flight documentation, flight planning and weather **and NOTAM** brief
b	Balloon inspection and servicing
c	Load calculation
d	Crowd control and crew briefings
e	Passenger briefing
f	Assembly and layout
g	Inflation and pre-take-off procedures
h	Take-off
i	ATC liaison – compliance
SECTION 2 GENERAL AIRWORK	
a	Climb to level flight
b	Level flight
c	Descent to level flight
d	Operating at low level

e	ATC liaison – compliance
SECTION 3 EN-ROUTE PROCEDURES	
a	Dead reckoning and map reading
b	Marking positions and time
c	Orientation, airspace structure
d	Maintenance of altitude
e	Ballast management
f	Communication with retrieve crew
g	ATC liaison – compliance / R/T communication
SECTION 4 APPROACH AND LANDING PROCEDURES	
a	Approach from low level, missed approach / fly on
b	Approach from high level, missed approach / fly on
c	Passenger pre-landing briefing
d	Pre-landing checks
e	Selection of landing field
f	Landing, dragging and deflation
g	ATC liaison – compliance / R/T communication
h	Actions after flight
SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES	
This section may be combined with Sections 1 through 4	
a	Simulated closed appendix during take off and climb
b	Simulated parachute/valve failure
c	Simulated passenger health problems
d	Other abnormal and emergency procedures as outlined in the appropriate flight manual
e	Oral questions

AMC No 1 to FCL.225.B

Extension of privileges to another balloon class or group

1. The aim of the flight training is to qualify BPL holders to exercise the privileges on a different class or group of balloons.
2. The following classes should be recognised:
   - hot air balloons
   - gas balloons
   - hot air airships
3. The following groups should be recognised:

   3.1 **Group A**~~Small~~:

   - hot air balloons and hot air airship**s** with a maximum envelope capacity of 4000m³

   gas balloons with a maximum envelope capacity of 12~~0~~**6**0m³

   3.2 **Group B**~~Medium~~:

   - hot air balloons and hot air airship with an envelope capacity between 400~~0~~**1**m³ and **7**~~10~~000m³
   - **gas balloons with an envelope capacity of more than 1260m³**

   3.3 **Group C**~~Large~~:

   - hot air balloons and hot air airship with an envelope capacity **between 7001m³ and** ~~of more than~~10**5**~~0~~00m³
   - ~~gas balloons with an capacity of more than 1200m³~~

   3.4 Group D:

   - **hot air balloons and hot air airships with an envelope capacity of more than 10500m³**

4. An extension **to**~~in~~ group **B**~~medium~~ is also valid for group **A**~~small~~. The extension for the group **C**~~large~~ is also valid for **the** group**s A and B**~~ medium and small~~. **An extension to group D will include the privilege for the other three groups.**
5. The approved training organisation should issue a certificate of satisfactory completion of the instruction for the purpose of licence endorsement.

SUBPART D

AMC No 1 to FCL.310, FCL.515 (b) and FCL.615 (b)

Theoretical knowledge syllabus for the ATPL, CPL and IR

1. **The following tables contain the detailed theoretical knowledge syllabus for the ATPL, CPL and IR. The applicable items for each licence or rating are marked with 'X'. An 'X' on the main title of a subject means that all the sub-divisions are applicable.**
   Aspects related to non-technical skills shall be included in an integrated manner, taking into account the particular risks associated to the licence and the activity.

A. Aeroplanes and helicopters

		Aeroplane		*Helicopter*			*IR*
		ATPL	CPL	ATPL/IR	ATPL	CPL	
010 00 00 00	AIR LAW AND ATC PROCEDURES	x	x	x	x	x	x
010 01 00 00	INTERNATIONAL LAW: CONVENTIONS, AGREEMENTS AND ORGANISATIONS						
010 02 00 00	AIRWORTHINESS OF AIRCRAFT						
010 03 00 00	AIRCRAFT NATIONALITY AND REGISTRATION MARKS						
010 04 00 00	PERSONNEL LICENSING						
010 05 00 00	RULES OF THE AIR						
010 06 00 00	PROCEDURES FOR AIR NAVIGATION SERVICES – AIRCRAFT OPERATIONS						
010 07 00 00	AIR TRAFFIC SERVICES AND AIR TRAFFIC MANAGEMENT						
010 08 00 00	AERONAUTICAL INFORMATION SERVICE						
010 09 00 00	AERODROMES/HELIPORTS						
010 10 00 00	FACILITATION						
010 11 00 00	SEARCH AND RESCUE						
010 12 00 00	SECURITY						

		Aeroplane		Helicopter			IR
		ATPL	CPL	ATPL/IR	ATPL	CPL	
010 13 00 00	AIRCRAFT ACCIDENT AND INCIDENT INVESTIGATION						
021 00 00 00	AIRCRAFT GENERAL KNOWLEDGE – AIRFRAME AND SYSTEMS, ELECTRICS, POWERPLANT, EMERGENCY EQUIPMENT	x	x	x	x	x	x
021 01 00 00	SYSTEM DESIGN, LOADS, STRESSES, MAINTENANCE						
021 02 00 00	AIRFRAME						
021 03 00 00	HYDRAULICS						
021 04 00 00	LANDING GEAR, WHEELS, TYRES, BRAKES						
021 05 00 00	FLIGHT CONTROLS						
021 06 00 00	PNEUMATICS – PRESSURISATION AND AIR CONDITIONING						
021 07 00 00	ANTI AND DE-ICING SYSTEMS						
021 08 00 00	FUEL SYSTEM						
021 09 00 00	ELECTRICS						
021 10 00 00	PISTON ENGINES						
021 11 00 00	TURBINE ENGINES						
021 12 00 00	PROTECTION AND DETECTION SYSTEMS						
021 13 00 00	OXYGEN SYSTEMS						
021 14 00 00	HELICOPTER: MISCELLANEOUS SYSTEMS						
021 15 00 00	HELICOPTER: ROTOR HEADS						
021 16 00 00	HELICOPTER: TRANSMISSION						
021 17 00 00	HELICOPTER: BLADES						
022 00 00 00	AIRCRAFT GENERAL KNOWLEDGE – INSTRUMENTATION	x	x	x	x	x	x
022 01 00 00	SENSORS AND INSTRUMENTS						
022 02 00 00	MEASUREMENT OF AIR DATA PARAMETERS						
022 03 00 00	MAGNETISM – DIRECT READING COMPASS AND FLUX VALVE						
022 04 00 00	GYROSCOPIC INSTRUMENTS						

		Aeroplane		Helicopter			IR
		ATPL	CPL	ATPL/IR	ATPL	CPL	
022 05 00 00	INERTIAL NAVIGATION AND REFERENCE SYSTEMS						
022 06 00 00	AEROPLANE: AUTOMATIC FLIGHT CONTROL SYSTEMS						
022 07 00 00	HELICOPTER: AUTOMATIC FLIGHT CONTROL SYSTEMS						
022 08 00 00	TRIMS – YAW DAMPER – FLIGHT ENVELOPE PROTECTION						
022 09 00 00	AUTOTHROTTLE – AUTOMATIC THRUST CONTROL SYSTEM						
022 10 00 00	COMMUNICATION SYSTEMS						
022 11 00 00	FLIGHT MANAGEMENT SYSTEM (F.M.S.)						
022 12 00 00	ALERTING SYSTEMS, PROXIMITY SYSTEMS						
022 13 00 00	INTEGRATED INSTRUMENTS – ELECTRONIC DISPLAYS						
022 14 00 00	MAINTENANCE, MONITORING AND RECORDING SYSTEMS						
022 15 00 00	DIGITAL CIRCUITS AND COMPUTERS						
030 00 00 00	FLIGHT PERFORMANCE AND PLANNING	x	x	x	x	x	
031 00 00 00	MASS AND BALANCE – AEROPLANES/HELICOPTERS	x	x	x	x	x	
031 01 00 00	PURPOSE OF MASS AND BALANCE CONSIDERATIONS						
031 02 00 00	LOADING						
031 03 00 00	FUNDAMENTALS OF CG CALCULATIONS						
031 04 00 00	MASS AND BALANCE DETAILS OF AIRCRAFT						
031 05 00 00	DETERMINATION OF CG POSITION						
031 06 00 00	CARGO HANDLING						
032 00 00 00	PERFORMANCE – AEROPLANES	x	x				
032 01 00 00	GENERAL						
032 02 00 00	PERFORMANCE CLASS B – SINGLE-ENGINE AEROPLANES						
032 03 00 00	PERFORMANCE CLASS B – MULTI-ENGINE AEROPLANES						

		Aeroplane		Helicopter			IR
		ATPL	CPL	ATPL/IR	ATPL	CPL	
032 04 00 00	PERFORMANCE CLASS A – AEROPLANES CERTIFICATED UNDER CS 25 ONLY						
033 00 00 00	FLIGHT PLANNING AND FLIGHT MONITORING	x	x	x	x	x	x
033 01 00 00	FLIGHT PLANNING FOR VFR FLIGHTS						
033 02 00 00	FLIGHT PLANNING FOR IFR FLIGHTS						
033 03 00 00	FUEL PLANNING						
033 04 00 00	PRE-FLIGHT PREPARATION						
033 05 00 00	ATS FLIGHT PLAN						
033 06 00 00	FLIGHT MONITORING AND IN-FLIGHT RE-PLANNING						
034 00 00 00	PERFORMANCE – HELICOPTERS			x	x	x	
034 01 00 00	GENERAL						
034 02 00 00	PERFORMANCE CLASS 3 SINGLE ENGINE HELICOPTERS ONLY						
034 03 00 00	PERFORMANCE CLASS 2						
034 04 00 00	PERFORMANCE CLASS 1 HELICOPTERS CERTIFICATED UNDER CS 29 ONLY						
040 00 00 00	HUMAN PERFORMANCE	x	x	x	x	x	x
040 01 00 00	HUMAN FACTORS: BASIC CONCEPTS						
040 02 00 00	BASIC AVIATION PHYSIOLOGY AND HEALTH MAINTENANCE						
040 03 00 00	BASIC AVIATION PSYCHOLOGY						
050 00 00 00	METEOROLOGY	x	x	x	x	x	x
050 01 00 00	THE ATMOSPHERE						
050 02 00 00	WIND						
050 03 00 00	THERMODYNAMICS						
050 04 00 00	CLOUDS AND FOG						
050 05 00 00	PRECIPITATION						
050 06 00 00	AIR MASSES AND FRONTS						
050 07 00 00	PRESSURE SYSTEMS						
050 08 00 00	CLIMATOLOGY						
050 09 00 00	FLIGHT HAZARDS						
050 10 00 00	METEOROLOGICAL INFORMATION						

		Aeroplane		*Helicopter*			*IR*
		ATPL	CPL	ATPL/IR	ATPL	CPL	
060 00 00 00	**NAVIGATION**	x	x	x	x	x	x
061 00 00 00	**GENERAL NAVIGATION**	x	x	x	x	x	x
061 01 00 00	**BASICS OF NAVIGATION**						
061 02 00 00	**MAGNETISM AND COMPASSES**						
061 03 00 00	**CHARTS**						
061 04 00 00	**DEAD RECKONING NAVIGATION (DR)**						
061 05 00 00	**IN-FLIGHT NAVIGATION**						
062 00 00 00	**RADIO NAVIGATION**	x	x	x	x	x	x
062 01 00 00	**BASIC RADIO PROPAGATION THEORY**						
062 02 00 00	**RADIO AIDS**						
062 03 00 00	**RADAR**						
062 04 00 00	*Intentionally left blank*						
062 05 00 00	**AREA NAVIGATION SYSTEMS, RNAV/FMS**						
062 06 00 00	**GLOBAL NAVIGATION SATELLITE SYSTEMS**						
070 00 00 00	**OPERATIONAL PROCEDURES**	x	x	x	x	x	
071 01 00 00	**GENERAL REQUIREMENTS**						
071 02 00 00	**SPECIAL OPERATIONAL PROCEDURES AND HAZARDS (GENERAL ASPECTS)**						
071 03 00 00	**HELICOPTER EMERGENCY PROCEDURES**						
080 00 00 00	**PRINCIPLES OF FLIGHT**	x	x	x	x	x	
081 00 00 00	**PRINCIPLES OF FLIGHT – AEROPLANE**	x	x				
081 01 00 00	**SUBSONIC AERODYNAMICS**						
081 02 00 00	**HIGH SPEED AERODYNAMICS**						
081 03 00 00	*Intentionally left blank*						
081 04 00 00	**STABILITY**						
081 05 00 00	**CONTROL**						
081 06 00 00	**LIMITATIONS**						
081 07 00 00	**PROPELLERS**						
081 08 00 00	**FLIGHT MECHANICS**						
082 00 00 00	**PRINCIPLES OF FLIGHT – HELICOPTER**			x	x	x	

		Aeroplane		Helicopter			IR
		ATPL	CPL	ATPL/IR	ATPL	CPL	
082 01 00 00	**SUBSONIC AERODYNAMICS**						
082 02 00 00	**TRANSONIC AERODYNAMICS and COMPRESSIBILITY EFFECTS**						
082 03 00 00	**ROTORCRAFT TYPES**						
082 04 00 00	**MAIN ROTOR AERODYNAMICS**						
082 05 00 00	**MAIN ROTOR MECHANICS**						
082 06 00 00	**TAIL ROTORS**						
082 07 00 00	**EQUILIBRIUM, STABILITY AND CONTROL**						
082 08 00 00	**HELICOPTER FLIGHT MECHANICS**						
090 00 00 00	**COMMUNICATIONS**	x	x	x	x	x	x
091 00 00 00	**VFR COMMUNICATIONS**						
091 01 00 00	**DEFINITIONS**						
091 02 00 00	**GENERAL OPERATING PROCEDURES**						
091 03 00 00	**RELEVANT WEATHER INFORMATION TERMS (VFR)**						
091 04 00 00	**ACTION REQUIRED TO BE TAKEN IN CASE OF COMMUNICATION FAILURE**						
091 05 00 00	**DISTRESS AND URGENCY PROCEDURES**						
091 06 00 00	**GENERAL PRINCIPLES OF VHF PROPAGATION AND ALLOCATION OF FREQUENCIES**						
092 00 00 00	**IFR COMMUNICATIONS**						
092 01 00 00	**DEFINITIONS**						
092 02 00 00	**GENERAL OPERATING PROCEDURES**						
092 03 00 00	**ACTION REQUIRED TO BE TAKEN IN CASE OF COMMUNICATION FAILURE**						
092 04 00 00	**DISTRESS AND URGENCY PROCEDURES**						
092 05 00 00	**RELEVANT WEATHER INFORMATION TERMS (IFR)**						
092 06 00 00	**GENERAL PRINCIPLES OF VHF PROPAGATION AND ALLOCATION OF FREQUENCIES**						
092 07 00 00	**MORSE CODE**						

B. Airships

B. Airships

		CPL	IR
010 00 00 00	**AIR LAW AND ATC PROCEDURES**		
010 01 00 00	**INTERNATIONAL LAW: CONVENTIONS, AGREEMENTS AND ORGANISATIONS**	X	
010 02 00 00	**AIRWORTHINESS OF AIRCRAFT**	X	
010 03 00 00	**AIRCRAFT NATIONALITY AND REGISTRATION MARKS**	X	
010 04 00 00	**PERSONNEL LICENSING**	X	X
010 05 00 00	**RULES OF THE AIR**	X	X
010 06 00 00	**PROCEDURES FOR AIR NAVIGATION SERVICES – AIRCRAFT OPERATIONS**	X	X
010 07 00 00	**AIR TRAFFIC SERVICES AND AIR TRAFFIC MANAGEMENT**	X	X
010 08 00 00	**AERONAUTICAL INFORMATION SERVICE**	X	X
010 09 00 00	**AERODROMES**	X	X
010 10 00 00	**FACILITATION**	X	
010 11 00 00	**SEARCH AND RESCUE**	X	
010 12 00 00	**SECURITY**	X	
010 13 00 00	**AIRCRAFT ACCIDENT AND INCIDENT INVESTIGATION**	X	
023 00 00 00	**AIRSHIP GENERAL KNOWLEDGE – ENVELOPE, AIRFRAME AND SYSTEMS, ELECTRICS, POWERPLANT, EMERGENCY EQUIPMENT**		
023 01 00 00	**DESIGN, MATERIALS,LOADS, STRESSES**	X	
023 02 00 00	**ENVELOPE AND AIRBAGS**	X	
023 03 00 00	**FRAMEWORK**	X	
023 04 00 00	**GONDOLA**	X	
023 05 00 00	**FLIGHT CONTROLS**	X	
023 06 00 00	**LANDING GEAR**	X	
023 07 00 00	**HYDRAULICS AND PNEUMATICS**	X	
023 08 00 00	**HEATING AND AIR CONDITIONING**	X	
023 09 00 00	**FUEL SYSTEM**	X	
023 10 00 00	**PISTON ENGINES**	X	
023 11 00 00	**TURBINE ENGINES (BASICS)**	X	
023 12 00 00	**ELECTRICS**	X	

		CPL	IR
023 13 00 00	FIRE PROTECTION AND DETECTION SYSTEMS	X	
023 14 00 00	MAINTENANCE	X	
024 00 00 00	AIRSHIP GENERAL KNOWLEDGE – INSTRUMENTATION		
024 01 00 00	SENSORS AND INSTRUMENTS	X	
024 02 00 00	MEASUREMENT OF AIR DATA AND GAS PARAMETERS	X	
024 03 00 00	MAGNETISM – DIRECT READING COMPASS AND FLUX VALVE	X	
024 04 00 00	GYROSCOPIC INSTRUMENTS	X	
024 05 00 00	COMMUNICATION SYSTEMS	X	
024 06 00 00	ALERTING SYSTEMS	X	
024 07 00 00	INTEGRATED INSTRUMENTS – ELECTRONIC DISPLAYS	X	
024 08 00 00	FLIGHT MANAGEMENT SYSTEM (GENERAL BASICS)	X	
024 09 00 00	DIGITAL CIRCUITS AND COMPUTERS	X	
030 00 00 00	FLIGHT PERFORMANCE AND PLANNING		
031 00 00 00	MASS AND BALANCE – AIRSHIPS		
031 01 00 00	PURPOSE OF MASS AND BALANCE CONSIDERATIONS		
031 02 00 00	LOADING	X	
031 03 00 00	FUNDAMENTALS OF CG CALCULATIONS	X	
031 04 00 00	MASS AND BALANCE DETAILS OF AIRCRAFT	X	
031 05 00 00	DETERMINATION OF CG POSITION	X	
031 06 00 00	PASSENGER, CARGO AND BALLAST HANDLING	X	
033 00 00 00	FLIGHT PLANNING AND FLIGHT MONITORING		
033 01 00 00	FLIGHT PLANNING FOR VFR FLIGHTS	X	
033 02 00 00	FLIGHT PLANNING FOR IFR FLIGHTS		X
033 03 00 00	FUEL PLANNING	X	X
033 04 00 00	PRE-FLIGHT PREPARATION	X	X
033 05 00 00	ATS FLIGHT PLAN	X	X
033 06 00 00	FLIGHT MONITORING AND IN-FLIGHT RE-PLANNING	X	X
035 00 00 00	PERFORMANCE – AIRSHIPS		
035 01 00 00	AIRWORTHINESS REQUIREMENTS	X	
035 02 00 00	BASICS OF AIRSHIP PERFORMANCE	X	
035 03 00 00	DEFINITIONS AND TERMS	X	

		CPL	IR
035 04 00 00	STAGES OF FLIGHT	X	
035 05 00 00	USE OF FLIGHT MANUAL	X	
040 00 00 00	HUMAN PERFORMANCE		
040 01 00 00	HUMAN FACTORS: BASIC CONCEPTS	X	
040 02 00 00	BASIC AVIATION PHYSIOLOGY AND HEALTH MAINTENANCE	X	
040 03 00 00	BASIC AVIATION PSYCHOLOGY	X	
050 00 00 00	METEOROLOGY		
050 01 00 00	THE ATMOSPHERE	X	
050 02 00 00	WIND	X	
050 03 00 00	THERMODYNAMICS	X	
050 04 00 00	CLOUDS AND FOG	X	
050 05 00 00	PRECIPITATION	X	
050 06 00 00	AIR MASSES AND FRONTS	X	
050 07 00 00	PRESSURE SYSTEMS	X	
050 08 00 00	CLIMATOLOGY	X	
050 09 00 00	FLIGHT HAZARDS	X	
050 10 00 00	METEOROLOGICAL INFORMATION	X	
060 00 00 00	NAVIGATION		
061 00 00 00	GENERAL NAVIGATION		
061 01 00 00	BASICS OF NAVIGATION	X	
061 02 00 00	MAGNETISM AND COMPASSES	X	
061 03 00 00	CHARTS	X	
061 04 00 00	DEAD RECKONING NAVIGATION (DR)	X	
061 05 00 00	IN-FLIGHT NAVIGATION	X	
062 00 00 00	RADIO NAVIGATION		
062 01 00 00	BASIC RADIO PROPAGATION THEORY	X	X
062 02 00 00	RADIO AIDS	X	X
062 03 00 00	RADAR	X	X
062 04 00 00	AREA NAVIGATION SYSTEMS, RNAV/FMS		X
	GLOBAL NAVIGATION SATELLITE SYSTEMS	X	X
070 00 00 00	OPERATIONAL PROCEDURES AIRSHIP		
073 01 00 00	GENERAL REQUIREMENTS	X	
073 02 00 00	SPECIAL OPERATIONAL PROCEDURES AND HAZARDS (GENERAL ASPECTS)	X	

		CPL	IR
073 03 00 00	EMERGENCY PROCEDURES	X	
080 00 00 00	PRINCIPLES OF FLIGHT		
083 00 00 00	PRINCIPLES OF FLIGHT – AIRSHIPS		
083 01 00 00	BASICS OF AEROSTATICS	X	
083 02 00 00	BASICS OF SUBSONIC AERODYNAMICS	X	
083 03 00 00	AERODYNAMICS OF AIRSHIPS	X	
083 04 00 00	STABILITY	X	
083 05 00 00	CONTROLLABILITY	X	
083 06 00 00	LIMITATIONS	X	
083 07 00 00	PROPELLERS	X	
083 08 00 00	BASICS OF AIRSHIP FLIGHT MECHANICS	X	
090 00 00 00	COMMUNICATIONS - AIRSHIPS		
091 00 00 00	VFR COMMUNICATIONS	X	
091 01 00 00	DEFINITIONS	X	
091 02 00 00	GENERAL OPERATING PROCEDURES	X	
091 03 00 00	RELEVANT WEATHER INFORMATION TERMS (VFR)	X	
091 04 00 00	ACTION REQUIRED TO BE TAKEN IN CASE OF COMMUNICATION FAILURE	X	
091 05 00 00	DISTRESS AND URGENCY PROCEDURES	X	
091 06 00 00	GENERAL PRINCIPLES OF VHF PROPAGATION AND ALLOCATION OF FREQUENCIES	X	
092 00 00 00	IFR COMMUNICATIONS		
092 01 00 00	DEFINITIONS		X
092 02 00 00	GENERAL OPERATING PROCEDURES		X
092 03 00 00	ACTION REQUIRED TO BE TAKEN IN CASE OF COMMUNICATION FAILURE		X
092 04 00 00	DISTRESS AND URGENCY PROCEDURES		X
092 05 00 00	RELEVANT WEATHER INFORMATION TERMS (IFR)		X
092 06 00 00	GENERAL PRINCIPLES OF VHF PROPAGATION AND ALLOCATION OF FREQUENCIES		X
092 07 00 00	MORSE CODE		X

SUBPART F

AIRLINE TRANSPORT PILOT LICENCE - ATPL

~~AMC to FCL.515.A and FCL.515.H~~

~~ATPL – Modular theoretical knowledge course~~

~~1. The aim of this course is to train pilots who have not received the theoretical knowledge instruction during an integrated course to the level of theoretical knowledge required for the ATPL.~~

~~2. An approved course should include formal classroom work and may include the use of such facilities as interactive video, slide/tape presentation, learning carrels and computer based training and other media distance learning (correspondence) courses as approved by the Authority. Approved distance learning (correspondence) courses may also be offered as part of the course.~~

AMC No 1 to FCL.510.A (b)(1)

Pre-requisites, experience and crediting

Equivalent requirements for CS-25 and CS-23 Commuter category are the JAR/FAR-25 transport category, JAR/FAR-23 Commuter category, or BCAR or AIR 2051.

SUBPART G

INSTRUMENT RATING

AMC No 1 to FCL.625(c)

Renewal of instrument rating – refresher training

1. Paragraph (b)(1) of FCL.740 determines that if the instrument rating has lapsed, the applicant shall go through refresher training at an approved training organisation, to reach the level of proficiency needed to pass the instrument element of the skill test prescribed in Appendix 9 to Part-FCL. The amount of refresher training needed should be determined on a case by case basis by the approved training organisation, taking into account the following factors:

   1.1 the experience of the applicant. To determine this, the training organisation should evaluate the pilot's log book, and, if necessary, conduct a test in an FSTD.

   1.2 the amount of time lapsed since the expiry of the validity period of the rating. The amount of training needed to reach the desired level of proficiency should increase with the time lapsed. In some cases, after evaluating the pilot, and when the time lapsed is very limited (less than 3 months), the training organisation may even determine that no further refresher training is necessary. The following may be taken as guidance when determining the needs of the applicant:

      (a) Expiry for a period shorter than 3 months: no supplementary requirements.
      (b) Expiry for longer than 3 months but shorter than 1 year: a minimum of 1 training session.
      (c) Expiry for longer than 1 year but shorter than 7 years: a minimum of 3 training sessions.
      (d) Expiry for longer than 7 years: the applicant should undergo the full training course for the issue of the IR.

2. Once the training organisation has determined the needs of the applicant, it should develop an individual training programme, **which**~~that~~ should be based on the initial training for the issue of instrument ratings and focus on the aspects where the applicant has shown the greatest needs.

3. After successful completion of the training, the training organisation should give a certificate to the applicant, to be submitted to the authority when applying for the renewal.

AMC No 1 to FCL.520.A and FCL.520.H

ATPL Skill test

The ATPL skill test may serve at the same time as a skill test for the issue of the licence and a proficiency check for the revalidation of the type rating for the aircraft used in the test and may be combined with the skill test for the issue of a multi-pilot type rating.

SUBPART H

CLASS AND TYPE RATINGS

GM No 1 to FCL.700

List of class ratings

The following tables contain lists of aeroplanes/TMG that are included in class ratings.

Class ratings (Aeroplane) – single-pilot – single/multi-engine piston aeroplane (land/sea)

Manufacturer	Aeroplanes		Licence Endorsement
All manufacturers	Single-engine piston (land)	(D)	SEP (land)
	Single-engine piston (land) with Variable pitch propellers (VP)		
	Single-engine piston(land) with Retractable undercarriage (RU)		
	Single-engine piston (land) with Turbo/super charged engines (T)		
	Single-engine piston (land) with Cabin pressurisation (P)		
	Single-engine piston (land) with Tail Wheels (TW)		
	Single-engine piston (land) with Electronic Flight Instrument System (EFIS)		
	Single-engine piston (land) with single lever power control (SLPC)		
	Single-engine piston (sea)	(D)	SEP (sea)
	Single-engine piston (sea) with Variable pitch propellers (VP)		
	Single-engine piston (sea) with Turbo/super charged engines(T)		
	Single-engine piston (sea) with Cabin pressurisation (P)		
	Single-engine piston (sea) with Electronic Flight Instrument System (EFIS)		
	Single-engine piston (sea) with Single lever power control(SLPC)		
All	Multi-engine piston (land)	(D)	MEP (land)

Manufacturer	Aeroplanes		Licence Endorsement
manufacturers	Multi-engine piston (sea)	(D)	MEP (sea)

Note: (D) indicates that differences training is required, in accordance with FCL.710.

Class ratings (Aeroplane) – single-pilot – single-engine piston touring motor glider (land)

Manufacturer	Aeroplanes		Licence Endorsement
All manufacturers	All Touring Motor Gliders having an integrally mounted, non-retractable engine and a non-retractable propeller.		TMG

GM No 1 to FCL.710

Differences and familiarisation training

1. Differences training requires the acquisition of additional knowledge and training on an appropriate training device or the aircraft.
2. Familiarisation training requires the acquisition of additional knowledge.

AMC No 1 to FCL.725 (a)

Syllabus of theoretical knowledge instruction for class/type ratings

A. Single-engine and multi-engine aeroplanes

DETAILED LISTING

1. Aeroplane structure and equipment, normal operation of systems and malfunctions

    1.1 Dimensions

    minimum required runway width for 180° turn

    1.2 Engine including auxiliary power unit

        1.2.1 type of engine/engines

        1.2.2 in general, function of the following systems or components:

        – engine
        – auxiliary power unit
        – oil system
        – fuel system
        – ignition system
        – starting system
        – fire warning and extinguishing system
        – generators and generator drives
        – power indication
        – reverse thrust

– water injection

1.2.3 on piston or turbine-propeller engines additionally:

– propeller system
– feathering system

1.2.**4**~~3~~ engine controls (including starter), engine instruments and indications in the cockpit, their function, interrelation and interpretation

1.2.**5**~~4~~ engine operation, including APU, during engine start, start and engine malfunctions, procedures for normal operation in the correct sequence

1.3 Fuel system

1.3.1 location of the fuel tanks, fuel pumps, fuel lines to the engines, tank capacities, valves and measuring

1.3.2 location of the following systems:

– filtering
– heating
– fuelling and defuelling
– dumping
– venting

1.3.3 in the cockpit
- the monitors and indicators of the fuel system,
- quantity and flow indication, interpretation

1.3.4 procedures
- fuel procedures distribution into the various tanks
- fuel supply, temperature control and fuel dumping

1.4 Pressurisation and air conditioning

1.4.1 components of the system and protection devices

1.4.2 cockpit monitors and indicators

interpretation with regard to the operational condition

1.4.3 normal operation of the system during start, cruise, approach and landing, air conditioning airflow and temperature control

1.5 Ice and rain protection, windshield wipers and rain repellent

1.5.1 ice protected components of the aeroplane including engines, heat sources, controls and indications

1.5.2 operation of the anti-icing/de-icing system during take-off, climb, cruise and descent, conditions requiring the use of the protection systems

1.5.3 controls and indications of the windshield wipers and rain repellent systems operation

1.6 Hydraulic system

1.6.1 components of the hydraulic system(s), quantities and system pressure, hydraulically actuated components associated to the respective hydraulic system

1.6.2 controls, monitors and indicators in the cockpit, function and interrelation and interpretation of indications

1.7 Landing gear

1.7.1 main components of the

- main landing gear
- nose gear
- gear steering
- wheel brake system, including anti-skid

1.7.2 gear retraction and extension (including changes in trim and drag caused by gear operation)

1.7.3 required tyre pressure, or location of the relevant placard

1.7.4 controls and indicators including warning indicators in the cockpit in relation to the retraction/extension condition of the landing gear and brakes

1.7.5 components of the emergency extension system

1.8 Flight controls and high lift devices

1.8.1
- aileron system
- elevator system
- rudder system
- **t**rim system
- spoiler system
- lift devices
- stall warning system
- take-off configuration warning system

1.8.2 flight control system from the cockpit controls to the flight control/surfaces

1.8.3 controls, monitors and indicators including warning indicators of the systems mentioned under 1.8.1, interrelation and dependencies

1.9 Electrical power supply

1.9.1 number, power, voltage, frequency and location of the main power system (AC or DC), auxiliary power system location and external power system

1.9.2 location of the controls, monitors and indicators in the cockpit

1.9.3 flight instruments, communication and navigation systems, main and back-up power sources

1.9.4 location of vital circuit breakers

1.9.5 generator operation and monitoring procedures of the electrical power supply

1.10 Flight instruments, communication, radar and navigation equipment, autoflight and flight recorder

1.10.1 visible antennae

1.10.2 controls and instruments of the following equipment in the cockpit during normal operation:

- flight instruments
- flight management systems
- radar equipment, including radio altimeter
- communication and navigation systems
- autopilot
- flight recorder, voice recorder
- ground proximity warning system
- collision avoidance system
- warning systems

1.11 Cockpit, cabin and cargo compartment

1.11.1 operation of the exterior, cockpit, cabin and cargo compartment lighting and the emergency lighting

1.11.2 operation of the cabin and cargo doors, stairs, windows and emergency exits

1.11.3 main components of the oxygen system and their location, oxygen masks and operation of the oxygen systems for the crew and passengers, required amount of oxygen by means of a table or diagram

1.12 Emergency equipment operation and correct application of the following emergency equipment in the aeroplane:

- portable fire extinguisher
- first aid kits
- portable oxygen equipment
- emergency ropes
- life vest
- life rafts
- emergency transmitters
- crash axes
- megaphones
- emergency signals

1.13 Pneumatic system

1.13.1 components of the pneumatic system, pressure source, actuated components

1.13.2 controls, monitors and indicators in the cockpit, function of the system

1.13.3 vacuum system

2. LIMITATIONS

2.1 General Limitations

2.1.1. certification of the aeroplane, category of operation, noise certification and maximum and minimum performance data for all flight profiles, conditions and a/c systems,

- maximum tail and crosswind-components at take-off and landing,

- maximum speeds for flap extension V_{fo}
- at various flap settings V_{fe}
- for landing gear operation V_{lo}, M_{lo}
- for extended landing gear V_{le}, M_{le}
- for maximum rudder deflection V_a, M_a
- for tyres
- one propeller feathered

2.1.2
- minimum control speed air V_{mca}
- minimum control speed ground V_{mcg}
- stall speed under various conditions V_{so},V_{s1}
- maximum speed V_{ne}, M_{ne}
- maximum speed for normal operation V_{mo}, M_{mo}
- altitude and temperature limitations
- stick shaker activation

2.1.3
- maximum airport pressure altitude, runway slope
- maximum taxi mass
- maximum take-off mass
- maximum lift off mass
- maximum landing mass
- zero fuel mass
- maximum dumping speed V_{dco}, M_{dco}, V_{dce}, M_{dce}
- maximum load factor during operation
- certificated range of centre of gravity

2.2 Engine Limitations

2.2.1 Operating data of the engines

- time limits and maximum temperatures
- minimum RPMs and temperatures
- torque
- maximum power for take-off and go-around with respect to pressure altitude/flight altitude and temperature
- piston engines: certified range of mixture
- minimum and maximum oil temperature and pressure
- maximum starter time and required cooling
- time between two start attempts for engines and auxiliary power unit
- for propeller: maximum RPM of propeller triggering of automatic feathering device.

2.2.2 Certified oil grades

2.3 Systems limitations

2.3.1 Operating data of the following systems:

- pressurisation, air conditioning maximum pressures
- electrical power supply, maximum load of main power system (AC or DC)
- maximum time of power supply by battery in case of emergency
- mach trim system and yaw damper speed limits
- auto pilot limitations of various modes
- ice protection
- speed and temperature limits of window heat

– temperature limits of engine and wing anti-ice

2.3.2 Fuel system

Certified fuel specifications, minimum and maximum pressures and temperature of the fuel

2.4 Minimum equipment list

3. PERFORMANCE, FLIGHT PLANNING **AND MONITORING**

3.1 Performance

Performance calculation concerning speeds, gradients, masses in all conditions for take off, en route, approach and landing according to the documentation available, e.g. for take-off V_1, V_{mbe}, V_r, V_{lof}, V_2, take-off distance, maximum take-off mass and the required stop distance with respect to the following factors:

- accelerate/stop distance
- take-off run and distance available (TORA, TODA)
- ground temperature, pressure altitude, slope, wind
- maximum load and maximum mass (e.g. ZFM)
- minimum climb gradient after engine failure
- influence of snow, slush, moisture and standing water on the runway
- possible single and/or dual engine failure during cruise flight
- use of anti-icing systems
- failure of water injection system and/or antiskid system
- speeds at reduced thrust, V_1, V_{1red}, V_{mbe}, V_{mu}, V_r, V_{lof}, V_2
- safe approach speed V_{ref}, with respect to V_{mca} and turbulent conditions
- effects of excessive approach speed and abnormal glideslope with respect to the landing distance
- minimum climb gradient during approach and landing
- limiting values for a go around with minimum fuel
- maximum allowable landing mass and the landing distance for the destination and alternate aerodrome with respect to the following factors:
- available landing distance
- ground temperature, pressure altitude, runway slope and wind
- fuel consumption to destination or alternate aerodrome
- influence of moisture on the runway, snow, slush and standing water
- failure of the water injection system and/or the anti skid system
- influence of thrust reverser and spoilers

3.2 Flight planning

Flight planning for normal and abnormal conditions

- optimum/maximum flight level
- minimum required flight altitude
- drift down procedure after an engine failure during cruise flight
- power setting of the engines during climb, cruise and holding under various circumstances, as well as the most economic cruising flight level
- calculation of a short range/long range flight plan

- optimum and maximum flight level and power setting of the engines after engine failure

3.3 Flight monitoring.

4. LOAD AND BALANCE AND SERVICING

4.1 Load and Balance

- load and trim sheet with respect to the maximum masses for take-off and landing
- centre of gravity limits

4.1.1 influence of fuel consumption on the centre of gravity

4.1.2 lashing points, load clamping, maximum ground load

4.2 Servicing **on ground**

Servicing connections for:

- fuel
- oil
- water
- hydraulic
- oxygen
- nitrogen
- conditioned air
- electric power
- start air
- toilet and safety regulations

5. EMERGENCY PROCEDURES

5.1 Recognition of the situation as well as immediate memory actions in correct sequence and for those conditions recognised as emergencies by the manufacturer and certification authority:

- engine failure during take off before and after V_1, as well as inflight
- malfunctions of the propeller system
- engine overheat, engine fire on ground and inflight
- wheel well fire
- electrical smoke and/or fire
- rapid decompression and emergency descent
- air-conditioning overheat, anti ice system overheat
- fuel pump failure
- fuel freezing/overheat
- electric power failure
- equipment cooling failure
- flight instrument failure
- partial or total hydraulic failure
- failures at the lift devices and flight controls including boosters
- cargo compartment smoke and/or fire

5.2 Actions according to the approved abnormal and emergency checklist

- engine restart inflight
- landing gear emergency extension
- application of the emergency brake system

- emergency extension of lift devices
- fuel dumping
- emergency descent

6. SPECIAL REQUIREMENTS FOR EXTENSION OF A TYPE RATING FOR INSTRUMENT APPROACHES DOWN TO DECISION HEIGHTS OF LESS THAN 200 FT (60 M)

6.1 Airborne and ground equipment

- technical requirements
- operational requirements
- operational reliability
- fail operational
- fail-passive
- equipment reliability
- operating procedures
- preparatory measures
- operational downgrading
- communications

6.2 Procedures and Limitations

- operational procedures
- crew co-ordination

7. SPECIAL REQUIREMENTS FOR 'GLASS COCKPIT' AEROPLANES WITH ELECTRONIC FLIGHT INSTRUMENT SYSTEMS (EFIS)

7.1 Additional learning objectives

7.1.1 general rules of aeroplanes computer hardware and software design

7.1.2 logic of all crew information and alerting systems and their limitations

7.1.3 interaction of the different aeroplane computer systems, their limitations, the possibilities of computer fault recognition and the actions to be performed on computer failures

7.1.4 normal procedures including all crew co-ordination duties

7.1.5 aeroplane operation with different computer degradations (basic flying)

8. FLIGHT MANAGEMENT SYSTEMS

B. Single and multi-engine helicopters

DETAILED LISTING

1. Helicopters structure, transmissions, rotors and equipment, normal and abnormal operation of systems.

1.1 Dimensions

1.2 Engine including aux. power unit, rotor and transmissions; if an initial type rating for a turbine engine helicopter is applied for, the applicant should have received turbine engine instruction.

1.2.1 type of engine/engines

1.2.2 in general the function of the following systems or components:

- engine
- aux. power unit
- oil system
- fuel system
- ignition system
- starting system
- fire warning and extinguishing system
- generators and generator drives
- power indication
- water/methanol injection

1.2.3 engine controls (including starter), engine instruments and indications in the cockpit, their function and interrelation and interpretation

1.2.4 engine operation, including APU, during engine start and engine malfunctions, procedures for normal operation in the correct sequence

1.2.5 transmission system

- lubrication
- generators and generator drives
- freewheeling units
- hydraulic drives
- indication and warning systems

1.2.6 type of rotor systems

- indication and warning systems

1.3 Fuel system

1.3.1 location of the fuel tanks, fuel pumps, fuel lines to the engines tank capacities, valves and measuring

1.3.2 the following systems:

- filtering
- fuelling and defuelling heatings
- dumping
- transferring
- venting

1.3.3 in the cockpit
the monitors and indicators of the fuel system, quantity and flow indication, interpretation

1.3.4 fuel procedures distribution into the various tanks
fuel supply and fuel dumping

1.4 Air conditioning

1.4.1 components of the system and protection devices

1.4.2 cockpit monitors and indicators

interpretation with regard to the operational condition

1.4.3 normal operation of the system during start, cruise approach and landing, air conditioning airflow and temperature control

1.5 Ice and rain protection, windshield wipers and rain repellent

1.5.1 ice protected components of the helicopter, including engines and rotor systems, heat sources, controls and indications

1.5.2 operation of the anti-icing/de-icing system during T/O, climb, cruise and descent, conditions requiring the use of the protection systems

1.5.3 controls and indications of the windshield wipers and rain repellent system operation

1.6 Hydraulic system

1.6.1 components of the hydraulic system(s), quantities and system pressure, hydraulically actuated components associated to the respective hydraulic system

1.6.2 controls, monitors and indicators in the cockpit, function and interrelation and interpretation of indications

Landing gear, skids fixed, floats

1.7.1 main components of the:

- main landing gear
- nose gear
- tail gear
- gear steering
- wheel brake system

1.7.2 gear retraction and extension

1.7.3 required tyre pressure, or location of the relevant placard

1.7.4 controls and indicators including warning indicators in the cockpit in relation to the retraction/extension condition of the landing gear

1.7.5 components of the emergency extension system

1.8 Flight controls, stab-and autopilot systems

1.8.1 controls, monitors and indicators including warning indicators of the systems, interrelation and dependencies

1.9 Electrical power supply

1.9.1 Number, power, voltage, frequency and if applicable phase and location of the main power system (AC or DC) auxiliary power system location and external power system

1.9.2 location of the controls, monitors and indicators in the cockpit

1.9.3 main and back-up power sources flight instruments, communication and navigation systems, main and back-up power sources

1.9.4 location of vital circuit breakers

1.9.5 generator operation and monitoring procedures of the electrical power supply

1.10 Flight instruments, communication, radar and navigation equipment, autoflight and flight recorder

1.10.1 antennas

1.10.2 controls and instruments of the following equipment in the cockpit:

- flight instruments (e.g. airspeed indicator, pitot static system, compass system, flight director)
- flight management systems
- radar equipment (e.g. wx radar, transponder)
- communication and navigation system (e.g. HF, VHF, ADF, VOR/DME, ILS, marker beacon) and area navigation systems (e.g. GPS~~, VLF Omega~~)
- stabilisation and autopilot system
- flight data recorder, cockpit voice recorder, radio altimeter
- collision avoidance system
- ground proximity warning system
- HUMS (Health and Usage Monitoring System)

1.11 Cockpit, cabin and cargo compartment

1.11.1 operation of the exterior, cockpit, cabin and cargo compartment lighting and the emergency lighting

1.11.2 operation of the cabin doors and emergency exits

1.12 Emergency equipment
operation and correct application of the following emergency equipment in the helicopter:

Mobile equipment	*Fixed equipment*
– portable fire extinguisher	emergency floats
– first aid kits	
– portable oxygen equipment	
– emergency ropes	
– life vest	
– life rafts	
– emergency transmitters	
– crash axes	
– megaphones	
– emergency signals	
– torches	

2. LIMITATIONS

2.1 General limitations, according to the helicopter flight manual

2.2 Minimum equipment list

3. PERFORMANCE, FLIGHT PLANNING AND MONITORING

3.1 Performance

Performance calculation concerning speeds, gradients, masses in all conditions for take-off, en route, approach and landing

3.1.1 Take off

- hover performance in and out of ground effect
- all approved profiles, cat A and B
- HV diagram
- take off and rejected take off distance
- take off decision point (TDP) or (DPAT)
- calculation of first and second segment distances
- climb performance

3.1.2 En-route

- airspeed indicator correction
- service ceiling
- optimum/economic cruising altitude
- max endurance
- max range
- cruise climb performance

3.1.3 Landing

- hovering in and out of ground effect
- landing distance
- landing decision point (LDP) or (DPBL)

3.1.4 Knowledge and/or calculation of

- V_{lo}, V_{le}, V_{mo}, V_x, V_y, V_{toss}, V_{ne}, $V_{max\ range}$, V_{mini}

3.2 Flight planning
Flight planning for normal and abnormal conditions

- optimum/maximum flight level
- minimum required flight altitude
- drift down procedure after an engine failure during cruise flight
- power setting of the engines during climb, cruise and holding under various circumstances as well as at the most economic cruising flight level
- optimum and maximum flight level and power setting after an engine failure

3.3 Effect of optional equipment on performance

4. LOAD, BALANCE AND SERVICING

4.1 Load and balance

- load and trim sheet with respect to the maximum masses for take-off and landing
- centre of gravity limits

4.1.1 influence of the fuel consumption on the centre of gravity

4.1.2 lashing points, load clamping, max ground load

4.2 Servicing on the ground
servicing connections for

- fuel
- oil, etc...

and safety regulations for servicing

5. EMERGENCY, PROCEDURES

6. SPECIAL REQUIREMENTS FOR EXTENSION OF A TYPE RATING FOR INSTRUMENT APPROACHES DOWN TO A DECISION HEIGHT OF LESS THAN 200 FT (60 M)

   6.1 Airborne and ground equipment

   - Technical requirements
   - Operational requirements
   - Operational reliability
   - Fail operational
   - Fail-passive
   - Equipment reliability
   - Operating procedures
   - Preparatory measures
   - Operational downgrading
   - Communication

   6.2 Procedures and limitations

   - Operational procedures
   - Crew co-ordination

7. SPECIAL REQUIREMENTS FOR HELICOPTERS WITH ELECTRONIC FLIGHT INSTRUMENT SYSTEMS (EFIS)

8. OPTIONAL EQUIPMENT

C. Airships

DETAILED LISTING

1. Airship structure and equipment, normal operation of systems and malfunctions

   1.1 Dimensions

   1.2 Structure and envelope

   1.2.1 Internal structure

   1.2.2 Envelope

   1.2.3 Pressure system

   1.2.4 Gondola

   1.2.5 Empennage

   1.3 Flight Controls

   1.4 Systems

   1.4.1 Hydraulic

   1.4.2 Pneumatic

   1.5 Landing gear

   1.6 Fuel system

1.7 Fire warning and extinguishing system

1.8 Emergency equipment

1.9 Electrical systems

1.10 Avionics, Radio Navigation and communication equipment

1.11 Instrumentation

1.12 Engines and propellers

1.13 Heating / ventilation / air-condition

1.14 Operational procedures during start, cruise, approach and landing,

1.14.1 Normal operations

1.14.2 Abnormal operations

2. Limitations

2.1 General Limitations

2.1.1. Certification of the airship, category of operation, noise certification and maximum and minimum performance data for all flight profiles, conditions and a/c systems

2.1.2 Speeds

2.1.3 Altitudes

2.2 Engine Limitations

2.3 Systems limitations

2.4 Minimum equipment list

3. Performance, Flight Planning

3.1 Performance calculation

3.2 Flight planning

4. Load and Balance, servicing

4.1 Load and Balance

4.2 Servicing

5. Emergency procedures

5.1. Recognition of emergency situations

5.2 Actions according to the approved abnormal and emergency checklist

AMC No 2 to FCL.725 (a)

Flight instruction for type ratings – Helicopters

1. The amount of flight instruction depend on:

- complexity of the helicopter type, handling caracteristics, level of technology
- category of helicopter (single-engine piston or turbine helicopter, multi-engine turbine and multi pilot helicopter);
- previous experience of the applicant;
- the availibiliy of FSTDs.

2. Flight Synthetic Training Devices (FSTDs)

The level of qualification and the complexity of the type will determine the amount of practical training that may be accomplished in FSTDs, including completion of the skill test. Prior to undertaking the skill test, a student should demonstrate competency in the skill test items during the practical training.

3. Initial issue
The flight instruction (excluding skill test) should comprise:

Helicopter types	In Helicopter	In Helicopter and FSTD associated training Credits
SEP (H)	–5 hrs	Using F**F**S C/D: At least 2 hrs helicopter and at least 6 hrs total Using FTD 2/3: At least 4 hrs helicopter and at least 6 hrs total
SET (H) under 3175 kg MTOM	–5 hrs	Using F**F**S C/D: At least 2 hrs helicopter and at least 6 hrs total Using FTD 2/3: At least 4 hrs helicopter and at least 6 hrs total
SET(H) at or over 3175 kg MTOM	–8 hrs	Using F**F**S C/D: At least 2 hrs helicopter and at least 10 hrs total Using FTD 2/3: At least 4 hrs helicopter and at least 10 hrs total
SPH MET (H) **CS/**JAR/FAR 27 and 29	–8 hrs	Using F**F**S C/D: At least 2 hrs helicopter and at least 10 hrs total Using FTD 2/3: At least 4 hrs helicopter and at least 10 hrs total
MPH	10 hrs	Using F**F**S C/D: At least 2 hrs helicopter, and at least 12 hrs total Using FTD 2/3: At least ~~6~~ **4** hrs helicopter, and at least 12 hrs total

4. Additional types
The flight instruction (excluding skill test) should comprise:

Helicopter types	In Helicopter	In Helicopter and FSTD associated training Credits
SEP(H) to SEP(H) within **AMC to FCL.740.H (a)(3)**~~Appendix 1 to JAR-FCL 2.245(b)(3)~~	–2 hrs	Using F**F**S C/D: At least 1 hr helicopter and at least 3 hrs total Using FTD 2/3: At least 1 hr helicopter and at least 4 hrs total
SEP(H) to SEP(H) not included in **AMC to FCL.740.H** ~~Appendix 1 to JAR-FCL 2.245(b)(3)~~	—5 hrs	Using F**F**S C/D: At least 1 hr helicopter and at least 6 hrs total Using FTD 2/3: At least 2 hr helicopter and at least 7 hrs total
SET(H) to SET(H)	—2 hrs	Using F**F**S C/D: At least 1 hr helicopter and at least 3 hrs total Using FTD 2/3: At least 1 hr helicopter and at least 4 hrs total
Single Engine difference training	—1 hr	N/A

MET(H) to MET(H)	–3 hrs	Using F**F**S C/D: At least 1 hr helicopter and at least 4 hrs total Using FTD 2/3: At least 2 hrs helicopter and at least 5 hrs total
Multi Engine difference training	—1 hrs	N/A
MPH to MPH	—5 hrs	Using F**F**S C/D: At least 1 hr helicopter and at least 6 hrs total Using FTD 2/3: At least 2 hrs helicopter and at least 7 hrs total
Extend privileges on the same type rating from SPH to MPH (except for initial MP issue), or from MPH to SPH	2 hrs	~~N/A~~**Using FFS C/D: At least 1 hr helicopter and at least 3 hrs total**

5. Holders of an IR(H) wishing to extend the IR(H) to further types should have additionally two hours flight training on type by sole reference to instruments according to IFR which may be conducted in a FS C/D or FTD 2/3. Holders of a SE IR(H) wishing to extend the IR privileges to a ME IR(H) for the first time should complete at **least 5 hours training.**

AMC No 1 to FCL.740(b)(1)

Renewal of class and type ratings – refresher training

1. Paragraph (b)(1) of FCL.740 determines that if a class or type rating has lapsed, the applicant shall take refresher training at an approved training organisation**. The objective of the training is** to reach the level of proficiency necessary to safely operate the relevant type or class of aircraft. The amount of refresher training needed should be determined on a case by case basis by the approved training organisation, taking into account the following factors:

   1.1 the experience of the applicant. To determine this, the training organisation should evaluate the pilot's log book, and, if necessary, conduct a test in an FSTD.

   1.2 the complexity of the aircraft.

   1.**3**~~2~~ the amount of time lapsed since the expiry of the validity period of the rating. The amount of training needed to reach the desired level of proficiency should increase with the time lapsed. In some cases, after evaluating the pilot, and when the time lapsed is very limited (less than 3 months), the training organisation may even determine that no further refresher training is necessary. The following can be taken as guidance when determining the needs of the pilot:

   (a) Expiry shorter than 3 months: no supplementary requirements.
   (b) Expiry longer than 3 months but shorter than 1 year: a minimum of 2 training sessions.
   (c) Expiry longer than 1 year but shorter than 3 years: a minimum of 3 training sessions in which the most important malfunctions in the available systems are covered.
   (d) Expiry longer than 3 years: the applicant should again undergo the training required for the initial issue of the rating **or, in case of**

helicopter, the training required for the "additional type issue", according to other valid ratings held.

2. Once the training organisation has determined the needs of the applicant, it should develop an individual training programme that should be based on the initial training for the issue of the rating and focus on the aspects where the applicant has shown the greatest needs.

3. After successful completion of the training, the training organisation should give a certificate**, or other documental evidence that the training has been successfully achieved** to the applicant, to be submitted to the authority when applying for the renewal. **The certificate/documental evidence need to contain a description of the training programme.**

AMC No 1 to FCL.720.A (b)(2)(i)

Additional theoretical knowledge for a class or type rating for high performance single-pilot aeroplanes

1. A number of aeroplanes certificated for single pilot operation have similar performances, systems and navigation capabilities to those more usually associated with multi-pilot types of aeroplanes, and regularly operate within the same airspace. The level of knowledge required to operate safely in this environment is not part of, or not included to the necessary depth of knowledge in the training syllabi for the PPL, CPL or IR(A) but these licence holders may fly as pilot-in-command of such aeroplanes. The additional theoretical knowledge required to operate such aeroplanes safely is obtained by completion of an course at an approved training organisation ~~covering the syllabus shown in Appendix 10~~.

2. The aim of the theoretical knowledge course is to provide the applicant with sufficient knowledge of those aspects of the operation of aeroplanes capable of operating at high speeds and altitudes, and the aircraft systems necessary for such operation.

COURSE SYLLABUS

3. The course should cover at least the following items of the aeroplane syllabus to the ATPL(A) level:

Subject Ref:	**Syllabus Content:**
021 00 00 00	**AIRFRAME AND SYSTEMS, ELECTRICS, POWERPLANT**
021 02 02 01 to 021 02 02 03	**Alternating current - general Generators AC power distribution**
021 01 08 03	**Pressurisation (Air driven systems - piston engines)**
021 01 09 04	**Pressurisation (Air driven systems - turbojet and turbo propeller)**
021 03 01 06 021 03 01 07 021 03 01 08 021 03 01 09	**Engine performance - piston engines Power augmentation (turbo/supercharging) Fuel Mixture**
021 03 02 00 to 021 03 04 09	**Turbine engines**

021 04 05 00	**Aircraft oxygen equipment**
032 02 00 00	**PERFORMANCE CLASS B - ME AEROPLANES**
032 02 01 00 to 032 02 04 01	**Performance of multi-engine aeroplanes not certificated under CS/JAR/FAR 25 – Entire subject**
040 02 00 00	**HUMAN PERFORMANCE**
040 02 01 00 to 040 02 01 03	**Basic human physiology and High altitude environment**
050 00 00 00	**METEOROLOGY - WINDS AND FLIGHT HAZARDS**
050 02 07 00 to 050 02 08 01	**Jet streams CAT Standing waves**
050 09 01 00 to 050 09 04 05	**Flight hazards Icing and turbulence Thunderstorms**
062 02 00 00	**BASIC RADAR PRINCIPLES**
062 02 01 00 to 062 02 05 00	**Basic radar principles Airborne radar SSR**
081 00 00 00	**PRINCIPLES OF FLIGHT – AEROPLANES**
081 02 01 00 to 081 02 03 02	**Transonic aerodynamics - Entire subject Mach number/shockwaves buffet margin/aerodynamic ceiling**

4~~3~~. Demonstration of acquisition of this knowledge is undertaken by passing an examination set by approved training organisation. Successfully passing this examination results in the issue of a certificate indicating that the course and examination have been completed.

5~~4~~. The certificate represents a 'once only' qualification and satisfies the requirement for the addition of all future high performance aeroplanes to the holder's licence. The certificate is valid indefinitely and is to be submitted with the application for the first HPA type or class rating.

6. A pass in any theoretical knowledge subjects as part of the HPA course will not be credited against meeting future theoretical examination requirements for issue of a CPL(A), IR(A) or ATPL(A).

AMC No 1 to FCL.725.A(b)

Theoretical knowledge and flight instruction for the issue of class rating sea

1. The theoretical knowledge instruction should be conducted by an instructor having appropriate experience of class rating sea.

2. Depending on the equipment and systems installed, the instruction should include, but not be limited to, the following content:

2.1 Theoretical Knowledge.

a. The aim of the training is to teach:

- **the importance of preparation for flight and the safe planning taking into consideration all the factors for manoeuvring the aircraft with respect to the wind, tidal currents, high and low water times and water movements at sea, river estuaries and lakes In addition icing conditions, ice covered water and broken ice flows,**
- **the techniques concerning the most critical moments at take-off, landing, taxiing and mooring the aircraft,**
- **the construction methods and characteristics of floats and water rudders and the importance of checking for leaks in the floats,**
- **the necessary requirements for the compliance of the rules for the avoidance of collisions at sea, in regard to sea charts, buoys and lights and horns**

b. After completing the training, the student should be able to:

- **describe the factors that have significance for planning and decision regarding initiation of seaplane flying and alternative measures for completion of flight,**
- **describe how the water level is affected by air pressure, wind, tide, regularisations and the flight safety depending on changes in the water level,**
- **describe the origin of different ice conditions in water areas,**
- **interpret nautical charts and maps regarding depths and shoals and risk for water currents, shifts of the wind, turbulence,**
- **decide what required equipment to bring during seaplane flying according to the operational requirements,**
- **describe the origin and extension of water waves, swells and water currents and their effect on the aeroplane,**
- **describe how water and air forces effect the aeroplane on water,**
- **describe the effect of water resistance on the aeroplanes´ performance on glassy water and during different wave conditions,**
- **describe the consequences of taxiing with too high engine revolutions per minute (RPM)**
- **describe the effect of pressure and temperature on performance at take-off and climb from lakes located at higher altitude,**
- **describe the effect of wind, turbulence, and other meteorological conditions of special importance for flight by lakes, islands in mountain areas and other broken ground,**

- describe the function of the water rudder and its handling, including the effect of lowered water rudder at take-off and landing,
- describe the parts of the float installation and their function,
- describe the effect of the floats on the aeroplanes´ aerodynamics and performance in water and in air,
- describe the consequences of water in the floats and fouling of float bottoms,
- describe aviation requirements that apply specifically for the conduct of aircraft activity on water,
- describe requirements regarding animal, nature and environment protection of significance for flight by seaplane, including flight in national parks,
- describe the meaning of navigation buoys,
- describe the organisation and working methods of the Sea Rescue Service,
- describe the requirements in ICAO Annex 2 as set out in 3.2.6, Water operation, including relevant parts of the Convention on the International Regulations for Preventing Collisions at Sea.

2.2 Practical training

a. The aim of the practical training is to learn:

- the skills in manoeuvring aeroplanes on water and in mooring the aeroplane,
- the skills required for the reconnaissance of landing and mooring areas from the air, including the take-off area,
- the skills for assessing the effects of different water depths, shoals, wind, height of waves and swell,
- the skills for flying with floats with regard to their effect on performance and flight characteristics,
- the skills for flying in broken ground during different wind and turbulence conditions.
- the skills for take-off and landing on glassy water, different degrees of swell and water current conditions.

b. After the training, the student should be able to:

- handle the equipment that shall be brought during seaplane flying,
- perform pre-flight daily inspection on aeroplane, float installation and special seaplane equipment, including emptying of floats,
- sail, taxi and turn the aeroplane at swell with correct handling of the water rudder,

- **taxi on the step and perform turns,**
- **establish the wind direction with the aeroplane,**
- **take necessary actions in the event of loss of steering ability and person falling overboard,**
- **make land and moor aeroplane at bridge, buoy and beach with the use of appropriate knots to secure the aircraft,**
- **maintain given rate of descent by means of variometer only,**
- **perform take-off and landing on glassy water with and without outer references,**
- **perform take-off and landing under swell,**
- **perform power-off landing,**
- **from the air, reconnaissance of landing, mooring and take-off areas, observing:**
- **wind direction and strength during landing and take-off,**
- **surrounding terrain,**
- **overhead wires and other obstacles above and under water,**
- **congested areas.**
- **determine wind direction and assess wind strength from water level and when airborne,**
- **state, for the aeroplane type in question;**
  - **maximum wave height allowed,**
  - **maximum number of ERPM allowed during taxiing.**
- **describe how flying with floats affects the performance and flight characteristics of the aeroplane,**
- **take corrective action at critical moments due to windshear and turbulence,**
- **navigate on the water with reference to buoys markers, obstacles and other traffic on the water.**

3. For the initial issue of class rating sea for single-pilot, single-engine and multi-engine aeroplanes, the number of multi- choice questions in the written or computer based examination should at least comprise thirty questions, and may be conducted by the training organisation. The pass mark should be 75%.

~~**AMC to FCL.730.A**~~

~~Requisites for pilots undertaking a zero flight time type rating (ZFTT) course~~

~~When a pilot is changing from a turbo-prop to a turbo-jet aeroplane or from a turbo-jet to a turbo-prop aeroplane, additional simulator training should be required.~~

AMC No 1 to FCL.735.A, FCL.735.H and FCL.735.As

Multi-crew co-operation course ~~– aeroplanes~~

Competency is a combination of knowledge, skills and attitudes required to perform a task to the prescribed standard.
The objectives of MCC training are to develop the technical and non-technical components of the knowledge, skills and attitudes required to operate a multi-crew aircraft.
Training should comprise both theoretical and practical elements and be designed to achieve the following competencies:

Competency	Performance indicators	Knowledge	Practical exercises
Communication	· Know what, how much and who to communicate to. · Ensure the recipient is ready and able to receive the information. · Pass messages and information clearly, accurately, timely and adequately. · Check the other person has the correct understanding when passing important information. · Listen actively, patiently and demonstrate understanding when receiving information. · Ask relevant and effective questions, and offer suggestions. · Use appropriate body language, eye contact and tone. · OOpen and receptive to other people's view.	· Human Factors, TEM/CRM · Application of Threat and Error Management and CRM principles to training	In a commercial air transport environment, apply multi- crew procedures, including principles of threat and error management and CRM to the following: · Pre-flight preparation - FMS initialization - Radio and navigation equipment preparation - Flight documentation - Computation of take-off performance data · Take-off and climb - Before take-off checks - Normal take-offs - Rejected take-off - Take-offs with abnormal and emergency situations including engine-out and wind shear

Competency	Performance indicators	Knowledge	Practical exercises
Leadership and Team working	· **Friendly, enthusiastic, motivating and considerate of others.** · **Use initiative, give direction and take responsibility when required.** · **Open and honest about thoughts, concerns and intentions.** · **Give and receive criticism and praise well, and admit mistakes.** · **Confidently do and say what is important to him/her.** · **Demonstrate respect and tolerance for other people.** · **Involve others in planning and share activities fairly.**		· **Cruise** - **Emergency descent** · **Descent and approach** - **Instrument flight procedures** - **Holding** - **Precision approach using raw data,** - **Precision approach using flight director** - **Precision approach using autopilot** - **One-engine inoperative approach** - **Non-precision and circling approaches** - **Computation of approach and**

Competency	Performance indicators	Knowledge	Practical exercises
Situation Awareness	· Aware of what the aircraft and its systems are doing. · Aware of where the aircraft is and its environment. · Keep track of time and fuel. · Aware of the condition of people involved in the operation including passengers. · Recognise what is likely to happen, plan and stay ahead of the game. · Develop what- if scenarios and make pre-decisions. · Identify threats to the safety of the aircraft and of the people.	·	landing data; - All engines go-around - Go-around with one engine inoperative; - Wind shear during approach ; · Landing; - transition from instrument to visual flight on reaching decision altitude/height or minimum descent altitude/ height · After landing and post flight procedures

Competency	Performance indicators	Knowledge	Practical exercises
Workload Management	· **Calm, relaxed, careful and not impulsive.** · **Prepare, prioritise and schedule tasks effectively.** · **Use time efficiently when carrying out tasks.** · **Offer and accept assistance, delegate when necessary and ask for help early.** · **Review and monitor and cross-check actions conscientiously.** · **Follow procedures appropriately and consistently.** · **Concentrate on one thing at a time, ensure tasks are completed and does not become distracted.** · **Carry out instructions as directed.**		· **Selected emergency and abnormal procedures**

Competency	Performance indicators	Knowledge	Practical exercises
Problem Solving and Decision Making	· **Identify and verify why things have gone wrong and do not jump to conclusions or make assumptions.** · **Seek accurate and adequate information from appropriate resources.** · **Persevere in working through a problem.** · **Use and agree an appropriate decision making process.** · **Agree essential and desirable criteria and prioritises.** · **Consider as many options as practicable.** · **Make decisions when they need to, reviews and changes if required.** · **Consider risks but do not take unnecessary risks.**		
Monitoring and cross-checking	· **Monitor and cross- checks all actions.** · **Monitor aircraft trajectory in critical flight phases.** · **Take appropriate actions in response to deviations from the flight path.**	· **SOP's** · **Aircraft systems** · **Undesired aircraft states**	

Competency	Performance indicators	Knowledge	Practical exercises
Task Sharing	· **Apply SOP's in both PF and PNF roles.** · **Makes and responds to standard callouts.**	· **PF/PNF roles** · **SOP's**	
Use of checklists	· **Utilise checklists appropriately according to SOP's.**	· **SOP's** · **Checklist philosophy**	
Briefings	· **Prepare and deliver appropriate briefings.**	· **SOP's** · **interpretation of FMS data and in-flight documentation**	
Flight Management	· **Maintain a constant awareness of the aircraft automation state.** · **Manage automation to achieve optimum trajectory and minimum workload.** · **Take effective recovery actions from automation anomalies.** · **Manage aircraft navigation, terrain clearance.** · **Manage aircraft fuel state and take appropriate actions.**	· **Understanding of aircraft performance and configuration** · **Systems** · **SOP's** · **Interpretation of FMS data and in-flight documentation** · **Minimum terrain clearance** · **Fuel management IFR and VFR regulation**	
FMS use	· **Programme, manage and monitor FMS in accordance with SOP's.**	· **Systems (FMS)** · **SOP's** · **Automation**	

Competency	Performance indicators	Knowledge	Practical exercises
Systems normal operations	· **Perform and monitor normal systems operation in accordance with SOP's.**	· **Systems** · **SOP's**	
Systems abnormal and emergency operations	· **Perform and monitor abnormal systems operation in accordance with SOP's.** · **Utilise electronic and paper abnormal checklists in accordance with SOP's.**	· **Systems** · **SOP's** · **Emergency and abnormal procedures and checklists** · **Recall items** ·	
Environment, weather and ATC	· **Communicate effectively with ATC.** · **Avoid misunderstandings by requesting clarification.** · **Adhere to ATC instructions.** · **Construct a mental model of the local ATC and weather environment.**	· **Systems** · **SOP's** · **ATC environment and phraseology** · **Procedures for hazardous weather conditions**	

~~MULTI-CREW CO-OPERATION TRAINING~~

~~1. The objectives of MCC training are optimum decision making, communication, division of tasks, use of checklists, mutual supervision, teamwork, and support throughout all phases of flight under normal, abnormal and emergency conditions. The training emphasises the development of non-technical skills applicable to working in a multi-crew environment.~~

~~2. The training should focus on teaching students the basics on the functioning of crew members as teams in a multi-crew environment, not simply as a collection of technically competent individuals. Furthermore, the course should provide students with opportunities to practice the skills that are necessary to be effective team leaders and members. This requires training exercises which include students as crew members in the PF and PNF roles.~~

~~3. Students should be made familiar with inter-personal interfaces and how to make best use of crew co-operation techniques and their personal and leadership styles in a way that fosters crew effectiveness. Students should be made aware that their behaviour during normal circumstances can have a powerful impact on crew functioning during high workload and stressful situations.~~

~~4. Research studies strongly suggest that behavioural changes in any environment cannot be accomplished in a short period even if the training is very well designed. Trainees need time, awareness, practice and feedback, and continual reinforcement to learn lessons that will endure. In order to be effective, multi-crew co-operation training should be accomplished in several phases spread over a period.~~

~~BASIC MULTI-CREW CO-OPERATION COURSE~~

~~5. The contents of the basic MCC course should cover theoretical knowledge training, practice and feedback in:~~

~~a. interfaces~~

- ~~examples of software, hardware, environment and live ware mismatches in practice~~

~~b. leadership/'followership' and authority~~

- ~~managerial and supervisory skills~~
- ~~assertiveness~~
- ~~barriers~~
- ~~cultural influence~~
- ~~PF and PNF roles~~
- ~~professionalism~~
- ~~team responsibility~~

~~c. personality, attitude and motivation~~

- ~~listening~~
- ~~conflict resolution~~
- ~~mediating~~
- ~~critique (pre-flight analyses and planning, ongoing-review, postflight)~~
- ~~team building~~

~~d. effective and clear communication during flight~~

- ~~listening~~
- ~~feedback~~
- ~~standard phraseologies~~
- ~~assertiveness~~
- ~~participation~~

~~e. crew co-ordination procedures~~

- ~~flight techniques and cockpit procedures~~
- ~~standard phraseologies~~
- ~~discipline~~

~~6. The use of checklists is of special importance for an orderly and safe conduct of the flights. Different philosophies have been developed for the use of checklists. Whichever philosophy is used depends on the complexity of the aircraft concerned, the situation presented, the flight crew composition and their operating experience and the operator's procedures as laid down in the Flight Operations Manual.~~

~~7. Mutual supervision, information and support.~~

~~a. Any action in handling the aircraft should be performed by mutual supervision. The pilot responsible for the specific action or task (PF or PNF) should be advised when substantial deviations (flight path, aircraft configuration etc.) are observed.~~

~~b. Call-out procedures are essential, especially during take-off and approach, to indicate progress of the flight, systems status etc.~~

~~c. Operation of aircraft systems, setting of radios and navigation equipment etc. should not be performed without demand by the PF or without information to the PF and his confirmation.~~

~~8. The contents of paragraphs 3 and 4 can best be practised by performing the exercises in simulated commercial air transport operations.~~

~~9. Practice and feedback of MCC with regard to the L-L (liveware-liveware) interface should also make provision for students for self and peer critique in order to improve communication, decision making and leadership skills. This phase is best accomplished through the use of flight simulators and video equipment. Video feedback is particularly effective because it allows participants to view themselves from a third-person perspective; this promotes acceptance of one's weak areas which encourages attitude and behavioural changes.~~

~~EXERCISES~~

~~10. The exercises should be accomplished as far as possible in a simulated commercial air transport environment. The instruction should cover the following areas:~~

~~a. pre-flight preparation including documentation, and computation of take-off performance data;~~

~~b. pre-flight checks including radio and navigation equipment checks and setting;~~

~~c. before take-off checks including powerplant checks, and take-off briefing by PF;~~

d. ~~normal take-offs with different flap settings, tasks of PF and PNF, call-outs;~~

e. ~~rejected take-offs; crosswind take-offs; take-offs at maximum take-off mass; engine failure after V_1;~~

f. ~~normal and abnormal operation of aircraft systems, use of checklists;~~

g. ~~selected emergency procedures to include engine failure and fire, smoke control and removal, windshear during take-off and landing, emergency descent, incapacitation of a flight crew member;~~

h. ~~early recognition of and reaction on approaching stall in differing aircraft configurations;~~

i. ~~instrument flight procedures including holding procedures; precision approaches using raw navigation data, flight director and automatic pilot, one engine simulated inoperative approaches, non-precision and circling approaches, approach briefing by PF, setting of navigation equipment, call-out procedures during approaches; computation of approach and landing data;~~

j. ~~go-arounds; normal and with one engine simulated inoperative, transition from instrument to visual flight on reaching decision height or minimum descent height/altitude.~~

k. ~~landings, normal, crosswind and with one engine simulated inoperative, transition from instrument to visual flight on reaching decision height or minimum descent height/altitude.~~

~~Where MCC training is combined with training for an initial type rating on a multi-pilot aeroplane, the exercises (a), (b), (c), (f), (g) and (j) may be conducted in a FTD as part of an approved course.~~

~~REINFORCEMENT~~

11. ~~No matter how effective the classroom curriculum, interpersonal drills, LOFT exercises, and feedback techniques are, a single exposure during the multi-crew co-operation course for the initial issue of a multi-pilot aeroplane type rating will be insufficient. The attitudes and influences which contribute to ineffective crew co-ordination are ubiquitous and may develop over a pilot's lifetime. Thus it will be necessary that the training of non-technical skills will be an integral part of all recurrent training for revalidation of a multi-pilot aeroplane type rating as well as of the training for the issue of further multi-pilot type ratings.~~

CERTIFICATE OF COMPLETION FORM

CERTIFICATE OF COMPLETION OF MCC-TRAINING

Applicant's last name:			First names:	
Type of licence:			Number:	State:
Multi-engine		***OR***	Multi-engine	

instrument rating:			Instrument rating skill test:	
issued on:			passed on:	
	Signature of applicant:			

The satisfactory completion of MCC-Training according to requirements is certified below:

TRAINING			
Multi-crew co-operation training received during period:			
from:	to:	at:	ATO / operator*
Location and date:		Signature of Head of ATO or authorised instructor*:	
Type and number of licence and State of issue:		Name in capital letters of authorised instructor:	

** Delete as appropriate*

~~AMC to FCL.735.H~~

~~Multi-crew co-operation course – helicopters~~

~~MULTI-CREW CO-OPERATION TRAINING~~

1. ~~The objectives of MCC training are optimum decision making, communication, division of tasks, use of checklists, mutual supervision, teamwork, and support throughout all phases of flight under normal, abnormal and emergency conditions. The training emphasises the development of non-technical skills applicable to working in a multi-crew environment.~~

2. ~~The training should focus on teaching students the basics on the functioning of crew members as teams in a multi-crew environment, not simply as a collection of technically competent individuals. Furthermore, the course should provide students with opportunities to practice the skills that are necessary to be effective team leaders and members. This requires training exercises which include students as crew members in the PF and PNF roles.~~

3. ~~Students should be made familiar with inter-personal interfaces and how to make best use of crew co-operation techniques and their personal and leadership styles in a way that fosters crew effectiveness. Students should be made aware that their behaviour during normal circumstances can have a powerful impact on crew functioning during high workload and stressful situations~~

4. ~~Research studies strongly suggest that behavioural changes in any environment cannot be accomplished in a short period even if the training is very well designed. Trainees need time, awareness, practice and feedback, and continual reinforcement to learn lessons that will endure. In order to be effective, multi-crew co-operation training should be accomplished in several phases spread over a period.~~

5. ~~The contents of the basic MCC course should cover theoretical knowledge training, practice and feedback in:~~

   a. ~~interfaces~~

      - ~~examples of Software, Hardware, Environment and Liveware mismatches in practice~~

   b. ~~leadership/'followership' and authority~~

      - ~~managerial and supervisory skills~~
      - ~~assertiveness~~
      - ~~barriers~~
      - ~~cultural influence~~
      - ~~PF and PNF roles~~
      - ~~professionalism~~
      - ~~team responsibility~~

   c. ~~personality, attitude and motivation~~

      - ~~listening~~
      - ~~conflict resolution~~
      - ~~mediating~~
      - ~~critique (pre-flight analyses and planning, ongoing review, postflight)~~
      - ~~team building~~

   d. ~~effective and clear communication during flight~~

      - ~~listening~~
      - ~~feedback~~
      - ~~standard phraseologies~~
      - ~~assertiveness~~
      - ~~participation~~

   e. ~~crew co-ordination procedures~~

      - ~~flight techniques and cockpit procedures~~
      - ~~standard phraseologies~~
      - ~~discipline~~

6. ~~The use of checklists is of special importance for an orderly and safe conduct of the flights. Different philosophies have been developed for the use of checklists. Whichever philosophy is used depends on the complexity of the aircraft concerned, the situation presented, the flight crew composition and their operating experience and the operator's procedures as laid down in the Flight Operations Manual.~~

~~7. Mutual supervision, information and support.~~

~~a. Any action in handling the aircraft should be performed by mutual supervision. The pilot responsible for the specific action or task (PF or PNF) should be advised when substantial deviations (flight path, aircraft configuration etc.) are observed.~~

~~b. Call-out procedures are essential, especially during take-off and approach, to indicate progress of the flight, systems status etc.~~

~~c. Operation of aircraft systems, setting of radios and navigation equipment etc. should not be performed without demand by the PF or without information to the PF and his confirmation.~~

~~COURSE OBJECTIVE~~

~~8. Practice and feedback of MCC with regard to the L-L (liveware-liveware) interface should also make provision for students for self and peer critique in order to improve communication, decision making and leadership skills. This phase is best accomplished through the use of FSTDs and video equipment. Video feedback is particularly effective because it allows participants to view themselves from a third-person perspective; this promotes acceptance of one's weak areas which encourages attitude and behavioural changes.~~

~~EXERCISES~~

~~9. The instruction should be accomplished as far as possible in a simulated commercial air transport environment and cover the following areas:~~

~~a. pre-flight preparation, including documentation; computation of take off performance data; radio and navigation equipment checks and setting;~~

~~b. before take-off checks, including powerplant checks; take-off briefing by PF;~~

~~c. take-offs and landings to and from :~~

~~– standard surface heliport~~
~~– pinpoint surface heliport~~
~~– elevated site~~
~~– helideck~~

~~task of PF and PNF; call outs;~~

~~d. rejected take-offs; crosswind take-offs; take-offs at maximum take-off mass ; engine failure before and after Take-off Decision Point (TDP); engine failure before and after Defined Point After Take-off (DPATO);~~

~~e. normal and abnormal operation of aircraft systems; use of checklists;~~

~~f. Emergency procedures to include engines (shut down and restart at a safe height) failure, fire, smoke control and removal; auto pilot/flight director failure, autorotation descent, tail rotor control failure (if applicable), tail rotor loss, hydraulic failure, SAS failure; wind and turbulence effect on raised structures, or due to heliport environment; emergency descent; incapacitation of a flight crew member;~~

~~g. early recognition of specific helicopter hazards, e.g. ground resonance, dynamic and static rollover, blade stall, vortex ring/setting with power, settling with power depending on type of operation;~~

h. ~~instrument flight procedures including holding procedures; precision approaches using raw navigation data, flight director and autopilot; one engine simulated inoperative approaches; autopilot inoperative approaches; non precision and circling approaches; radar approaches on fixed or moving platforms; call out procedures during approaches; computation of approach and landing data;~~

i. ~~normal go-arounds; go arounds with one engine simulated inoperative and with autopilot or stabiliser inoperative; rejected landing; support of the PF by the PNF;~~

j. ~~normal and crosswind landings with one simulated engine failure before and after landing decision point (LDP) and one simulated engine failure before defined point before landing (DPBL) and with autopilot or Stability Augmentation System (SAS) inoperative; transition from instrument to visual flight on reaching decision height or minimum descent height/altitude.~~

~~Where MCC training is combined for an initial type rating on a multi-pilot helicopter, the exercises (a) and (b) may be conducted in a~~ **[**~~FS or~~**]** ~~FTD as part of an approved course.~~

~~REINFORCEMENT~~

10. ~~No matter how effective the classroom curriculum, interpersonal drills, LOFT exercises, and feedback techniques are, a single exposure during the multi-crew co-operation course for the initial issue of a multi-pilot helicopter type rating will be insufficient. The attitudes and influences which contribute to ineffective crew co-ordination are ubiquitous and may develop over a pilot's lifetime. Thus it will be necessary that the training of non-technical skills will be an integral part of all recurrent training for revalidation of a multi-pilot helicopter type rating as well as of the training for the issue of further multi-pilot type ratings.~~

~~CERTIFICATE OF COMPLETION FORM~~

~~CERTIFICATE OF COMPLETION OF MCC-TRAINING~~

~~Applicant's last name:~~			~~First names:~~	
~~Type of licence:~~			~~Number:~~	~~State:~~
~~Instrument rating:~~		***~~OR~~***	~~Instrument rating skill test:~~	
~~issued on:~~			~~passed on:~~	
	~~Signature of applicant:~~			

~~The satisfactory completion of MCC-Training according to requirements is certified below:~~

~~TRAINING~~			
~~Multi-crew co-operation training received during period:~~			
~~from:~~	~~to:~~	~~at:~~	~~ATO / operator*~~
~~Location and date:~~		~~Signature of Head of ATO or authorised instructor*:~~	
~~Type and number of licence and state of issue:~~		~~Name in capital letters of authorised instructor:~~	

~~ Delete as appropriate~~*

~~AMC to FCL.740.Ha~~

~~Revalidation and renewal of type ratings – helicopters~~

~~The revalidation of an IR (H), if held, may be combined with the class or type rating proficiency check.~~

AMC No 1 to FCL.740.H (a)(3)

Revalidation and renewal of type ratings – helicopters

1. Only the following single-engine piston helicopter types can be considered for crediting of the proficiency check. Other single-engine piston helicopters (e.g. the R22 and R44) should not be given credit for.

Manufacturer	Helicopter Type and Licence Endorsement
Agusta-Bell	
- SE piston	**Bell47**
Bell Helicopters	
- SE piston	**Bell47**
Brantley	
-SE piston	**BrantleyB2**
Breda Nardi	
- SE piston	**HU269**
Enstrom	
- SE piston	**ENF28**
Hélicoptères Guimbal	
- SE piston	**Cabri G2**
Hiller	
- SE piston	**UH12**

Hughes/Schweizer	
- SE piston	**HU269**
Westland	
- SE piston	**Bell47**

GM No 1 to FCL.720.PL

Experience requirements and pre-requisites for the issue of type ratings for the powered lift

The endorsement of a powered-lift type rating to an aeroplane or helicopter licence does not confer upon its holder the privileges to fly helicopters or aeroplanes, respectively.

SUBPART I

ADDITIONAL RATINGS

AMC No 1 to FCL.800

Aerobatic Rating – Theoretical knowledge and flying training

1. The aim of the aerobatic training is to qualify licence holders to perform aerobatic manoeuvres.
2. The approved training organisation should issue a certificate of satisfactory completion of the instruction for the purpose of licence endorsement.

THEORETICAL KNOWLEDGE

3. The theoretical knowledge syllabus should cover the revision and/or explanation of:

    3.1 Human factors and body limitation

    - spatial disorientation
    - airsickness
    - body stress and g-forces, positive and negative
    - effects of grey- and black out

    3.2 Technical subjects

    - legislation affecting aerobatic flying to include environmental and noise subjects
    - principles of aerodynamics to include slow flight, stalls and spins, flat and inverted
    - general airframe and engine limitations **(if applicable)**

    3.3 Limitations applicable to the specific aircraft category (and type)

    - airspeed limitations (aeroplane, helicopter, touring motor glider, sailp**l**ane – as applicable)
    - symmetric load factors (type related - as applicable)
    - rolling g's (type related – as applicable)

    3.4 Aerobatic manoeuvres and recovery

    - entry parameters
    - planning systems and sequencing of manoeuvres
    - rolling manoeuvres
    - **looping**~~over the top~~ manoeuvres
    - combination manoeuvres
    - entry and recovery from developed spins, flat, accelerated and inverted

    3.5. Emergency procedures

– recovery from unusual attitudes

– drills to include use of parachutes and aircraft abandonment **(if worn)**

FLYING TRAINING

4. The exercises of the aerobatic flying training syllabus should be repeated as necessary until the applicant achieves a safe and competent standard. **Having completed the flight training the student pilot should be able to perform a solo flight containing a sequence of aerobatic manoeuvres.** The **dual** training **and the supervised solo training flights** should be tailored to the category of aircraft and limited to the permitted manoeuvres of that type of aircraft. The exercises should comprise at least the following practical training items~~ (if permitted)~~:

4.1 Confidence manoeuvres and recoveries

slow flights and stalls

steep turns

side slips

engine restart in flight (if applicable)

spins and recovery

recovery from spiral dives

recovery from unusual attitudes

4.**2**~~1~~ Aerobatic manoeuvres

Chandelle

Lazy Eight

~~Aileron~~ Roll**s**

~~Barrel Roll~~

~~Rudder Roll~~

Loop**s**~~ and inverted loop~~

Inverted Flight

Hammerhead Turn

Immelmann

~~Split S~~

~~**4.2. Confidence manoeuvres and recoveries**~~

~~**slow flights and stalls**~~

~~**steep turns**~~

~~**side slips**~~

~~**engine restart in flight (if applicable)**~~

~~**spins and recovery**~~

~~**recovery from spiral dives**~~

~~**recovery from unusual attitudes**~~

AMC No 1 to FCL.805

Towing Rating – Theoretical knowledge and flying training

1. The aim of the towing instruction is to qualify licence holders to tow banners or sailplanes.

2. The approved training organisation should issue a certificate of satisfactory completion of the training for the purpose of licence endorsement.

THEORETICAL KNOWLEDGE

TOWING OF SAILPLANES

3.1 The theoretical knowledge syllabus should cover the revision and/or explanation of:

- regulations concerning towing flights
- equipment for the towing activity
- sailplane towing techniques including:
    - signals and communication procedures
    - take off (normal / cross wind)
    - in flight launch procedures
    - descending on tow
    - sailplane release procedure
    - tow rope release procedure
    - landing with tow rope connected **(if applicable)**
    - emergency procedures during tow including equipment malfunctions
    - ~~specific sailplane towing~~ safety procedures
    - flight performance of the applicable aircraft type when towing sailplanes
    - look out and collision avoidance
    - performance data sailplanes including:
    - suitable speeds
    - stall characteristics in turns

THEORETICAL KNOWLEDGE

BANNER TOWING

3.2 The theoretical knowledge syllabus should cover the revision and/or explanation of:

- regulations concerning banner towing
- equipment for the banner towing activity
- ground crew coordination

- pre-flight procedures
- banner towing techniques including:
  - take-off launch
  - banner pickup manoeuvres
  - flying with banner in tow
  - release procedure
  - landing with banner in tow **(if applicable)**
  - emergency procedures during tow including equipment malfunctions
  - ~~specific banner towing~~ safety procedures
  - flight performance of the applicable aircraft type when towing a heavy/light banner
  - prevention of stall during towing operations

FLYING TRAINING

TOWING OF SAILPLANES

4.1. The exercises of the towing training syllabus for towing sailplanes should be repeated as necessary until the student achieves a safe and competent standard and should comprise at least the following practical training items:

- take off procedures (normal and cross wind take offs)
- 360° circles on tow with a bank of 30° and more
- descending **on tow**~~during launch~~
- release procedure of the sailplane
- landing with the tow rope connected **(if applicable)**
- tow rope release procedure in-flight
- emergency procedures (simulation)
- signals and communication during tow

FLYING TRAINING

BANNER TOWING

4.2 The exercises of the towing training syllabus for banner towing should be repeated as necessary until the student achieves a safe and competent standard and should comprise at least the following practical training items:

- pickup manoeuvres
- towing in-flight techniques
- release procedures
- flight at critically low airspeeds
- maximum performance manoeuvres
- emergency manoeuvres to include equipment malfunctions (simulated)
- specific banner towing safety procedures

- go around with the banner connected
- loss of engine power with the banner attached (simulated)

AMC No 1 to FCL.810 (b)

PPL(H) Night Rating Course

1. The aim of the course is to qualify PPL(H) holders to exercise the privileges of the licence at night.
2. The approved training organisation should issue a certificate of satisfactory completion of the course for the purpose of licence endorsement.

THEORETICAL KNOWLEDGE

3. The theoretical knowledge syllabus should cover the revision and/or explanation of:
   - night VMC minima
   - rules regarding airspace control at night and facilities available
   - rules regarding aerodrome ground/runway/landing site/obstruction lighting
   - aircraft navigation lights and collision avoidance rules
   - physiological aspects of night vision and orientation
   - dangers of disorientation at night
   - dangers of weather deterioration at night
   - instrument systems/functions and errors
   - instrument lighting and emergency cockpit lighting systems
   - map marking for use under cockpit lighting
   - practical navigation principles
   - radio navigation principles
   - planning and use of safety altitude
   - danger from icing conditions, avoidance and escape manoeuvres

FLYING TRAINING

4. In all cases, exercises 4 to 6 of the night rating flight syllabus should be completed.
5. For exercises 1 to 3, up to 50 % of the required flight training may be completed in a STD(H). However, all items within each exercise should be conducted in a helicopter in flight.
6. Items marked (*) should be completed in simulated IMC and may be completed in daylight.
7. The flying exercises should comprise:

Exercise 1

(repeat as necessary until the student achieves a safe and competent standard)

- revise basic manoeuvres when flying by sole reference to instruments*

- explain and demonstrate transition to instrument flight from visual flight*
- explain and revise recovery from unusual attitudes by sole reference to instruments*

Exercise 2

(repeat as necessary until the student achieves a safe and competent standard)

- explain and demonstrate use of radio navigation aids when flying by sole reference to instruments, to include position finding and tracking*

Exercise 3

(repeat as necessary until the student achieves a safe and competent standard)

- explain and demonstrate the use of Radar Assistance *

Exercise 4

(repeat as necessary until the student achieves a safe and competent standard)

- explain and demonstrate use and adjustment of landing light
- explain and demonstrate night hovering:
    - higher and slower than by day
    - avoidance of unintended sideways or backwards movements
- explain and demonstrate night take-off techniques
- explain and demonstrate night circuit technique
- explain and demonstrate night approaches (constant angle) with or without visual approach aids to:
    - heliports
    - illuminated touchdown areas
- practise take-off's, circuits and approaches
- explain and demonstrate night Emergency procedures to include:
    - simulated engine failure,

      (to be terminated with power recovery at a safe altitude)
    - simulated engine failure including single engine approach and landing, (multi-engine only)
    - simulated inadvertent entry to IMC (not on base leg or final)
    - simulated hydraulic control failure (to include landing)
    - internal and external lighting failure
    - other Malfunctions and Emergency procedures as required by the Aircraft Flight Manual

Exercise 5

- solo night circuits

Exercise 6

- explain and demonstrate night cross country techniques
- practise night cross country dual and as SPIC to a satisfactory standard

AMC No 1 to FCL.815
Mountain rating – Theoretical knowledge and flying training

THEORETICAL KNOWLEDGE	
WHEEL ~~RATING~~	SKI ~~RATING~~
1. Equipement~~s~~	
W.1.1 Personal equipment for the flight. W.1.2 Aircraft equipment for the flight.	S.1.1 Personal equipment for the flight. S.1.2 Aircraft equipment for the flight.
2. Take off techniques	
W 2.1 Technique for approach and landing on a mountain surface	S.2.1 Technique for approach and landing on a mountain surface. S.2.2 Landing technique on skis.
W 2.2 Rolling techniques of the aircraft on various runway profiles.	S.2.3 Rolling techniques of the aircraft on skis regarding the snow nature
W 2.3 Take-off technique	S.2.4 Take-off technique on snowed surfaces.
W 2.4 Aircraft and engine performances regarding altitude.	S.2.5. Aircraft and engine performances regarding altitude.
3. Rules	
W 3.1 Mountain rating W 3.2 Overflight rules W 3.3 Surfaces classification W 3.4 Pilot in command responsibilities W 3.5 Responsibilities of the surface manager W 3.6 The flight plan	S 3.1 Mountain rating S 3.2 Overflight rules S 3.3 Surfaces classification S 3.4 Pilot in command responsibilities S 3.5 Responsibilities of the surface manager S.3.6 The flight plan S.3.7 Certification of the ski mounted aeroplanes
4. Meteorology	
W 4.1 Movements of the air mass W 4.2 Flight consequences W 4.3 Relief effect on the movement of the air masses W 4.4 Altimetry	S.4.1 Movements of the air mass S.4.2 Flight consequences S.4.3 Relief effect on the movement of the air masses S.4.4 Altimetry
5. Human Performance and Limitations	
W.5.1 The cold W.5.2 The food W.5.3 The hypoxia	S.5.1 The cold S.5.2 The food. S.5.3 The hypoxia.

W.5.4 The radiance	S.5.4 The radiance
W.5.5 The thirst	S.5.5 The thirst
W.5.6 The tiredness	S.5.6 The tiredness
W.5.7 Turbulence effects in altitude	S.5.7 Turbulence effects in altitude
6. Navigation	
W.6.1 Progress of the flight	S.6.1 Progress of the flight
W.6.2 Dead reckoning	S.6.2 Dead reckoning
W.6.3 The path over the relief	S.6.3 The path over the relief
W.6.4 Progress in the valleys	S.6.4 Progress in the valleys
W.6.5 Detection of the man-made obstacles (high voltage lines, chairlifts, cables, etc.).	S.6.5 Detection of the man-made obstacles (high voltage lines, chairlifts, cables, etc.).
7. Specific items	
	S.7.1 Knowledge of the snow and assessment of the snow nature in flight
	S.7.2 Knowledge of the glacier.
	S.7.3 Life of the glacier.
	S.7.4 Formation of the cracks.
	S.7.5 Snow bridges
	S.7.6 Avalanches
8. Survival	
	S.8.1 Ways of survival (psychological aspects).
	S.8.2 Use of the equipments.
	S.8.3 Removal the snow on the aircraft.
	S.8.4 Building of a shelter
	S.8.5 How to feed
FLIGHT INSTRUCTION	
WHEEL ~~RATING~~	SKI ~~RATING~~
I.- Navigation	
W.I.1 Flight techniques in the valleys.	S.I.I Flight techniques in the valleys.
W.I.2 Flight over mountain passes and ridges	S.I.2 Flight over mountain passes and ridges.
W.I.3 U-turn in narrow valleys.	S.I.3 U-turn in narrow valleys.
W.I.4 Choice of the flight path regarding aerology	S.I.4 Choice of the flight path regarding aerology
W.I.5 Map reading	S.I.5 Map reading
II. – Arrival and reconnaissance	
W.II.1 Choice of the altitude of arrival.	S.II.1 Choice of the arrival altitude.
W.II.2 Choice of the arrival and overfly pattern.	S.II.2 Choice of the arrival and overflight pattern.
W.II.3 Choice of the landing pattern.	S.II.3 Description of the circuit pattern.
W.II.4 Aero logy awareness	S.II.4 Aerology awareness.
W.II.5 Evaluation of the length of the runway.	S.II.5 Evaluation of the runway length.
W.II.6 Evaluation of the runway profile (slope and banking).	S.II.6 Evaluation of the runway profile (slope and banking).

W II.7 Collision avoidance. W II.8 Definition of the references for the landing (touch down point). W II.9 Determination of the circuit pattern altitude. W II.10 Choice of the final speed regarding the runway profile.	S.II.7 Collision avoidance . S.II.8 Definition of the references for the landing (touch down point). S.II.9 Determination of the circuit pattern altitude. S.II.10 Choice of the final speed regarding the runway profile. S.II.11 Choice of the take-off axis S.II.12. Choice of the landing axis S.II.13 Choice of the parking area S.II.14 Observation of the obstacles on the ground (cracks, snow bridges, avalanches). S.II.15 Estimation of the snow nature. S.II.16 Observation of the way to reach a refuge from the landing area
III – Approach and landing	
W.III.1 Landing pattern altitude. W III.2 Precision of flight along the landing path. W III.3 Corrections on the landing path (accuracy and effectiveness). W III.4 Landing (precision of the flare and of the touch down point). W III.5 Taxiing (use of the engine power) on various profiles W III.6 Parking of the aircraft (regarding the runway profile, the traffic, etc.).	S.III.1 Landing pattern altitude. S.III.2 Precision of flight along the landing path.. S.III.3 Corrections on the landing path (accuracy and effectiveness). S.III.4 Landing (precision of the flare and of the touch down point). S.III.5 Taxi of the aircraft on various snows and various runway profiles. S.III.6 Parking of the aircraft regarding the snow nature and the profile of the apron. S.III.7 Turns on various snow nature and various ground profiles.
IV. – Take-off	
W IV.1 Safety checks before take-off. W IV.2 Lining up on the runway. W IV.3 Control of the runway axis during take-off. W IV.4 Choice and use of the visual references of the take-off axis.	S. IV.1 Safety checks before take-off. S.IV.2 Lining up on the runway. S.IV.3 Control of the runway axis during take-off S.IV.4 Choice and use of the visual references of the take-off axis. S.IV.5 Acceleration regarding the nature of the snow. S.IV.6 Short take-off. S.IV.7 Take-off avoiding the skid of the skis.
V. - Survival	
	S.V.1 Use of the snowshoes. S.V.2 Use of the markings.

AMC No 2 to FCL.815

Mountain rating – Skill test and proficiency check

The skill test for the issue or the **proficiency check for the revalidation or** renewal of a mountain rating should contain the following elements:

1. ORAL EXAMINATION

   This part should be done before the flight and should cover all the relevant parts of the theoretical knowledge. At least one question for each of the following sections should be asked:

   – Specific equipment for a mountain flight (personal and aircraft)

   – Rules of the mountain flight

   If the oral examination reveals a lack in theoretical knowledge, the flight test should not be done and the skill test is failed.

2. PRACTICAL SKILL TEST

   During the flight test, two different sites from the departure airport should be used for recognition, approach, landing and take-off. For the **m**~~Ski M~~ountain **r**~~R~~ating **ski or the extension from wheel to ski**, one of the two different sites should be a glacier.

AMC No 1 to FCL.820

Flight test rating – Training course
GENERAL

1. Competency based training.

1.1 Training courses for the flight test rating should be competency based. The training programme should as much as possible follow the syllabus outlined below, but may be adapted taking into account the previous experience, skill and theoretical knowledge level of the applicants.

1.2 It should also be recognised that the syllabi below assume that suitable flight test experience will be gained subsequent to attendance on the course. Should the applicant be significantly experienced already, then consideration should be made of that experience and it is possible that course content might be reduced in areas where that experience has been obtained.

1.3 Furthermore, it should be noted that flight test ratings are specific both to a certain category of aircraft (aeroplanes or helicopters) and to a certain category of flight test (category 1 or 2). Therefore, holders of a flight test rating wishing to extend their privileges to further categories of aircraft or to further categories of flight test (this is only relevant for holders of a category 2 flight test rating since the category 1 flight test rating includes the privileges for category 2 test flights) should not be requested to undertake the same course as an 'ab-initio' applicant. In these cases, the approved training organisation should develop specific 'bridge courses' taking into account the same principles mentioned above.

1.4. To allow proper consideration of the applicant's previous experience, a pre-entry assessment of the applicant's skills should be undertaken by the applicant, on the basis of which the approved training organisation may evaluate the level of the applicant to better tailor the course. Consequently, the syllabi listed below should be regarded as a list of individual demonstrable competencies and qualifications rather than a list of mandatory training objectives.

2. Continuous evaluation

2.1. Training courses for the flight test rating should be build on a continuous evaluation model, in order to ensure that successful completion of the course ensures that the applicant has reached the level of competence (both theoretical and practical) to be issued a flight test rating.

COURSE CONTENT

3. In addition, the content of the course should vary taking into account whether the applicant seeks privileges for a category 1 or 2 flight test rating, as well as the relevant category of aircraft, and their level of complexity. In order to better take these factors into account, training courses for the flight test rating have been divided into 2 conditions:

3.1 Condition 1 courses apply to category 1 flight test ratings on:

a. helicopters certificated in accordance with the standards of CS-27 or CS-29 or equivalent airworthiness codes;

b. aeroplanes certificated in accordance with:

(i) the standards of CS-25 or equivalent airworthiness codes; or

(ii) the standards of CS-23 or equivalent airworthiness codes, within the commuter category or having an MD above 0.6 and/or a maximum ceiling above 25.000ft.

3.2 **Condition 2 training courses apply to:**

3.2.1 **category 2 flight test ratings for:**

a. helicopters certificated in accordance with the standards of CS-27 or CS-29 or equivalent airworthiness codes;

b. aeroplanes certificated in accordance with:

(i) the standards of CS-25 or equivalent airworthiness codes; or

(ii) the standards of CS-23 or equivalent airworthiness codes (included those mentioned in 3.1.b.(ii)), except for aeroplanes with a maximum take-off mass of less than 2000Kg.

3.2.2 category 1 flight tests for aeroplanes certificated in accordance with the standards of CS-23, with a maximum take-off mass of more than 2000kg, with the exclusion of those mentioned in 3.1.b.(ii) (which are subject to condition 1 courses).

AEROPLANES

4. Condition 1 courses for aeroplanes.

4.1 These courses should include approximately:

a. 350 hours of ground training;

b. 100 hours of flight test training, during which at least 15 flights should be made without an instructor on board.

c. Principles of test management and risk and safety managements should be integrated throughout the course. In addition, principles and methods applicable to the certification activity, as well as safety assessments should be taught.

4.2 These courses should include instruction on at least 10 different aircraft types, of which at least 1 should be certificated in accordance with CS-25 standards or equivalent airworthiness codes.

4.3. During the course the student should be required to develop at least 5 substantial flight test reports.

4.4 The student should be evaluated through examinations on all of the theoretical knowledge subjects, and undertake a final in-flight test upon completion of the syllabus.

4.5 Syllabus. The following subjects should be covered in the course:

CONDITION 1 - AEROPLANES		
Theoretical knowledge	- Aerodynamics - Stability and control / Handling qualities - Engines and Performance - Measurements and flight test instrumentation (including telemetry)	
Flight test techniques and flight training:	**Performance:** **(at least 1 flight test report should be developed)**	- Airspeed calibration - Climb multi-engine - Take Off and landing, including turboprop/turbofan OEI
	Engines	- Turboprop/ Turbofan limitations and relight envelope
	Handling qualities **(at least 2 flight test reports should be developed)**	- Flight controls characteristics - Longitudinal Handling Qualities - Longitudinal manoeuvre stability - Take-Off and landing multi-turboprop / turbofan, including Vmcq and Vmu

		- Lateral-Directional Handling Qualities - Handling Qualities Evaluation - Variable stability demo flights including High Order Flight Control Systems (HOFCS) - Stalls - Spins - VMCa
	Systems (at least 1 flight test report should be developed)	At least 3 different systems, for example: - Autopilot/AFCS - Glass cockpit evaluation - Radio navigation, instruments qualification and integrated avionics - EGPWS - TCAS
	High speed certification test	
	Final evaluation exercise (a flight test report should be developed)	

5. Condition 2 courses for aeroplanes.

5.1 These courses should include approximately:

a. 150 hours of ground training;

b. 50 hours of flight test training, during which at least 8 flights of which should be made without an instructor on board.

c. Principles of test management and risk and safety managements should be integrated throughout the course. In addition, principles and methods applicable to the certification activity, as well as safety assessments should be taught.

5.2 These courses should include instruction on at least 7 different aircraft types, of which at least 1 should be certificated in accordance with CS-25 standards or equivalent airworthiness codes.

5.3. During the course the student should be required to develop at least 3 substantial flight test reports.

5.4 The student should be evaluated through examinations on all of the theoretical knowledge subjects, and undertake a final in-flight test upon completion of the syllabus.

5.5 Syllabus. The following subjects should be covered in the course:

<table>
<tr><td colspan="3">CONDITION 2 - AEROPLANES</td></tr>
<tr><td>Theoretical knowledge</td><td colspan="2">- Aerodynamics
- Stability and control / Handling qualities
- Engines and Performance
- Measurements and flight test instrumentation (including telemetry)</td></tr>
<tr><td rowspan="4">Flight test techniques and flight training:</td><td>Performance:
(at least 1 flight test report should be developed)</td><td>- Airspeed calibration
- Climb multi-engine
- Take Off and landing multi-Turboprop / turbofan</td></tr>
<tr><td>Handling qualities</td><td>- Flight control characteristics
- Longitudinal static / dynamic stability and control / handling qualities
- Lateral / directional stability and control / handling qualities
- Stalls
- Spins</td></tr>
<tr><td>Systems
(at least 1 flight test report should be developed)</td><td>At least 3 different systems, for example:
- Autopilot/AFCS
- Glass cockpit evaluation
- Radio navigation, instruments qualification and integrated avionics
- EGPWS
- TCAS</td></tr>
<tr><td colspan="2">Final evaluation exercise (a flight test report should be developed)</td></tr>
</table>

HELICOPTERS

6. Condition 1 courses for helicopters:

6.1 These courses should include approximately:

a. 350 hours of ground training;

b. 100 hours of flight test training, during which at least 20 flights without an instructor on board should be made.

c. Principles of test management and risk and safety managements should be integrated throughout the course. In addition, principles and methods applicable to the certification activity, as well as safety assessments should be taught.

6.2 These courses should include instruction on at least 8 different aircraft types, of which at least 1 should be certificated in accordance with CS-29 standards or equivalent airworthiness codes.

6.3. During the course the student should be required to develop at least 5 substantial flight test reports.

6.4 The student should be evaluated through examinations on all of the theoretical knowledge subjects, and undertake a final in-flight test upon completion of the syllabus.

6.5 Syllabus. The following subjects should be covered in the course:

<table>
<tr><th colspan="3">CONDITION 1 - HELICOPTERS</th></tr>
<tr><td>Theoretical knowledge</td><td colspan="2">- Aerodynamics
- Stability and control / Handling qualities
- Engines and Performance
- Measurements and flight test instrumentation (including telemetry)</td></tr>
<tr><td rowspan="4">Flight test techniques and flight training:</td><td>Performance:
(at least 1 flight test report should be developed)</td><td>- Airspeed calibration
- Level flight, climb and descent, vertical and hover performance</td></tr>
<tr><td>Engines</td><td>- Digital engine governing
- Turbine / Piston engine evaluation</td></tr>
<tr><td>Handling qualities
(at least 1 flight test report should be developed)</td><td>- Flight control characteristics
- Longitudinal static / dynamic stability and control / handling qualities
- Lateral / directional stability and control / handling qualities
- ADS 33
- Teetering rotor assessment
- Rigid rotor assessment
- Variable stability demo flights including High Order Flight Control Systems (HOFCS)</td></tr>
<tr><td>Systems
(at least 1 flight test report should be developed)</td><td>At least 3 different systems, for example:
-Navigation management systems
- Auto-pilot / AFCS
- Night vision Goggles / Electro-optics</td></tr>
</table>

	- Glass cockpit evaluation
	Height / velocity envelope and engine-off landings (EOL), including relights
	Category A procedure
	Vibrations and rotor adjustments
	Auto rotations
	Final evaluation exercise (a flight test report should be developed)

7. Condition 2 courses for helicopters.

7.1 These courses should include approximately:

a. 150 hours of ground training;

b. 50 hours of flight test training, during which at least 8 flights without an instructor on board should be made;

c. Principles of test management and risk and safety management should be integrated throughout the course. In addition, principles and methods applicable to the certification activity, as well as safety assessments should be taught.

7.2 These courses should include instruction on at least 4 different aircraft types, of which at least 1 should be certificated in accordance with CS-29 standards or equivalent airworthiness codes.

76.3. During the course the student should be required to develop at least 3 substantial flight test reports should be made.

7.4 The student should be evaluated through examinations on all of the theoretical knowledge subjects, and undertake a final in-flight test upon completion of the syllabus.

7.5 Syllabus. The following subjects should be covered in the course:

CONDITION 2 - HELICOPTERS		
Theoretical knowledge	- Aerodynamics - Stability and Control / Handling qualities - Engines and Performance - Measurements and flight test instrumentation (including telemetry)	
Flight test techniques and flight training:	Performance: (at least 1 flight test report should be developed)	- Airspeed calibration - Level flight, climb and descent, vertical and hover performance
	Engines	- Digital engines governing - Turbine / piston engine evaluation

	Handling qualities	**- Flight control characteristics** **- Longitudinal static / dynamic stability and control / handling qualities** **- Lateral / directional stability and control / handling qualities**
	Systems **(at least 1 flight test report should be developed)**	**At least 3 different systems, for example:** **- Navigation management systems** **- Auto-pilot/AFCS** **- Night vision Goggles/Electro-optics** **- Glass cockpit evaluation**
	Vibration and rotor adjustments	
	Final evaluation exercise (a flight test report should be developed)	

~~AMC to FCL.820~~
~~Conduct of flight tests — Training course~~
~~The content of the course should vary taking into account the type of aircraft. The following table provides an overview of the different types of course~~

~~Categories of flight test~~ ~~Aircraft~~	~~Category 1~~	~~Category 2~~
~~CS-25; CS-23 jets and CS-23 Commuters~~	~~Condition 1~~	~~Condition 2~~
~~Other CS-23~~	~~Condition 2~~	~~Condition 2~~
~~CS-27~~	~~Condition 1~~	~~Condition 2~~
~~CS-29~~	~~Condition 1~~	~~Condition 2~~

~~Condition 1:~~
~~For CS-25 aircraft; jet aeroplanes certified to CS-23, CS-23 Commuter Category aircraft; and CS-27 and CS-29 rotorcraft, the training should cover Performance; Handling Qualities; Systems and Test management and can be outlined as follows:~~

- ~~For fixed wing test pilots: duration 10 months; 500 hours of ground training; 110/120 flying hours on 15/25 different airplanes.~~
- ~~For rotorcraft test pilots: duration 10 months; 500 hours of ground training; 110/120 flying hours on 4 to 10 rotorcraft~~
- ~~Batchelor of Sciences or equivalent University standards are usually requested from applicants.~~

~~Condition 2:~~

~~This condition requires a significant amount of flight experience, in accordance to the task and requires training for flight testing activities, the amount of which should be specifically adapted to the tasks. Such courses may last 15 weeks and the flying training should amount to 38 hours on 12 types of airplanes.~~

SUBPART J
INSTRUCTORS

AMC No 1 to FCL.900

Instructor certificates

1**.** General

1.1 ~~Nine~~ **10** instructor categories are recognised:

a. Light aircraft flight instructor certificate – aeroplane (LAFI(A)), helicopter (LAFI(H)), sailplane LAFI(S), balloon (LAFI(B));

b. Flight instructor certificate – aeroplane (FI(A)), helicopter (FI(H)), powered-lift (FI(PL)), airship (FI(As)), sailplane (FI(S)), balloon (FI(B));

c. Type rating instructor certificate – aeroplane (TRI(A)), helicopter (TRI(H)), powered-lift (TRI(PL));

d. Class rating instructor certificate – aeroplane (CRI(A));

e. Instrument rating instructor certificate – aeroplane (IRI(A)), helicopter (IRI(H)), airship (IRI(As)) ;

f. Synthetic flight instructor certificate – aeroplane (SFI(A), helicopter (SFI(H));

g. Multi crew Co-operation instructor certificate **- a**eroplanes (MCCI(A)**), helicopters (MCCI(H)), powered-lift (MCCI(PL)), airships (MCCI(As))**;

h. Synthetic training instructor certificate – aeroplane (STI(A)), helicopter (STI(H));

i. Mountain rating instructor certificate – (MI)**;**

j. **Flight test instructor certificate – (FTI)**.

1.2 For categories a) to e) and for ~~f~~**i**) **and j)** the applicant needs to hold a pilot licence. For categories f) to h) no licence is needed, only an instructor certificate.

1.3 A person may hold more than one instructor certificate.

2. Special conditions.

2.1 When new aircraft are introduced, requirements such as to hold a licence and rating equivalent to the one for which instruction is being given, or to have adequate flight experience, may not be possible to comply with. In this case, to allow for the first instruction courses to be given to applicants for licences or ratings for these aircraft, competent authorities need the possibility to issue a specific certificate that does not have to comply with the requirements established in this Subpart.

2.2 The competent authority should only give these certificates to holders of other instruction qualifications. As far as possible, preference should be given to persons with **at least 100 hours of** experience in similar types or classes of aircraft**.**

2.3 **When the new aircraft type introduced in an operator's fleet already existed in a Member State of the EU, the competent authority should only give the specific certificate to an applicant that is qualified as pilot-in-command on that aircraft.**

2.4 The certificate should ideally be limited in validity to the time needed to qualify the first instructors for the new aircraft in accordance with this Subpart, but in any case it should not exceed the ~~3~~ **1** year~~s~~ established in the rule.

AMC No 1 to FCL.920

Instructor competencies and assessment

1. Training should be both theoretical and practical. Practical elements should include the development of specific instructor skills, particularly in the area of teaching and assessing threat and error management and CRM.

2. The training and assessment of instructors should be made against the following performance standards:.

Competence	**Performance**	**Knowledge**
Prepare resources	- Ensure adequate facilities - Prepares briefing material - Manage available tools	- Understand objectives - Available tools - Competency based training methods
Create a climate conducive to learning	- Establishes credentials, role models appropriate behaviour - Clarifies roles - States objectives - Ascertains and supports trainees needs	- Barriers to learning - Learning styles
Present knowledge	- Communicates clearly - Creates and sustains realism - Looks for training opportunities	- Teaching methods
Integrate TEM/CRM	- Makes TEM/CRM links with technical training	- Human Factors, TEM/CRM
Manage Time to achieve training objectives	- Allocate time appropriate to achieving competency objective	- Syllabus time allocation
Facilitate learning	- Encourage trainee participation - Motivating, patient, confident, assertive manner - Conducts one-to-one	- Facilitation - How to give constructive feedback - How to encourage trainees to ask questions and seek advice

	coaching - Encourages mutual support	
Assesses trainee performance	- Assess and encourage trainee self assessment of performance against competency standards - Makes assessment decision and provide clear feedback - Observes CRM behaviour	- Observation techniques - Methods for recording observations
Monitor and review progress	- Compare individual outcomes to defined objectives - Identify individual differences in learning rates - Apply appropriate corrective action	- Learning styles - Strategies for training adaptation to meet individual needs
Evaluate training sessions	- Elicits feedback from trainees. - Tracks training session processes against competence criteria - Keeps appropriate records	- Competency unit and associated elements - Performance criteria
Report outcome	- Report accurately using only observed actions and events	- Phase training objectives - Individual versus systemic weaknesses

AMC No 1 to FCL.925

MPL instructor course

1. The objectives of the MPL instructors training course are to train applicants to deliver training in accordance with the features of a competency based approach to training and assessment.

2. Training should be both theoretical and practical. Practical elements should include the development of specific instructor skills, particularly in the area of teaching and assessing threat and error management and CRM in the multi-crew environment

3. The course is intended to adapt instructors to conduct competency-based MPL training. It should cover the items specified below:

THEORETICAL KNOWLEDGE

4. Integration of operators and organisations providing MPL training

   - Reasons for development of the MPL
   - MPL training course objective

- Adoption of harmonised training and procedures
- Feedback process

5. The philosophy of a competency-based approach to training
    - Principles of competency-based training
6. Regulatory framework, instructor qualifications and competencies
    - Source Documentation
    - Instructor Qualifications
    - Syllabus Structure
7. Introduction to Instructional Systems Design methodologies (See ICAO PANS-TRG Doc)
    - Analysis
    - Design and Production
    - Evaluation and Revision

8 Introduction to the MPL Training Scheme
- Training phases and content
- Training media
- Competency Units, elements and performance criteria

9. Introduction to human performance limitations, including the principles of threat and error management and appropriate countermeasures developed in CRM.
    - Definitions
    - Appropriate behaviours categories
    - Assessment system
10. Application of the principles of threat and error management and CRM principles to training
    - Application and practical uses
    - Assessment methods
    - Individual corrective actions
    - Debriefing techniques
11. The purpose and conduct of assessments and evaluations
    - Basis for continuous assessment against a defined competency standard
    - Individual assessment
    - Collection and analysis of data
    - Training System evaluation

PRACTICAL TRAINING

12. Practical training may be conducted by interactive group classroom modules, and/or by the use of training devices. The objective is to enable instructors to:
    - Identify behaviours based on observable actions in the following areas:

        - Communications
        - Team working
        - Situation Awareness
        - Workload Management
        - Problem Solving and Decision Making
    - Analyse the root causes of undesirable behaviours
    - Debrief students using appropriate techniques, in particular
        - Use of facilitative techniques
        - Encouragement of student self-analysis
    - Agree corrective actions with the student/s
    - Determine achievement of the required competency

AMC No 2 to FCL.925

MPL instructors - renewal of privileges – refresher training

1. Paragraph (d) of FCL.925 determines that if the applicant has not complied with the requirements to maintain his privileges to conduct competency based approach training, he/she shall receive refresher training at an approved training organisation to reach the level of competence necessary to pass the assessment of instructor competencies. The amount of refresher training needed should be determined on a case by case basis by the approved training organisation, taking into account the following factors:

    1.1 the experience of the applicant.

    1.2 the amount of time lapsed since the last time the applicant has conducted training in an MPL course. The amount of training needed to reach the desired level of competence should increase with the time lapsed. In some cases, after evaluating the instructor, and when the time lapsed is very limited, the training organisation may even determine that no further refresher training is necessary.

2. Once the training organisation has determined the needs of the applicant, it should develop an individual training programme, that should be based on the MPL instructor course and focus on the aspects where the applicant has shown the greatest needs.

GM No 1 to FCL.925

MPL Instructors

The following table summarises the instructor qualifications for each phase of MPL integrated training course:

Phase of training	Qualification
Line Flying Under Supervision in accordance with Part-OPS	Line Training Captain or TRI(A)
Phase 4 – Advanced Base Training	TRI(A)
Phase 4 – Advanced Skill Test	TRE(A)
Phase 4 - Advanced	SFI(A) or TRI(A)
Phase 3 -Intermediate	SFI(A) or TRI(A)
Phase 2 - Basic	- FI(A) **or** IRI(A) + IR(A)/ME/MCC + 1500hrs multi crew environment + IR(A) instructional privileges, or - FI(A) + MCCI(A), or - FI(A) + SFI(A), or - FI(A) + TRI(A)
Phase 1 - Core Flying Skills	- FI(A) + 500hrs, including 200hrs instruction Instructor qualifications and privileges should be in accordance with the training items within the phase. STI for appropriate exercises conducted in a FNPT or BITD.

AMC No 1 to FCL.935

Assessment of competence – General

1. **The format and application form for the assessment of competence are determined by the competent authority.**
2. **When an aircraft is used for the assessment, it should meet the requirements for training aircraft.**

3. If an aircraft is used for the test or check, the examiner acts as the pilot-in-command, except in circumstances agreed upon by the examiner when another instructor is designated as pilot-in-command for the flight.

4. During the skill test the applicant occupies the seat normally occupied by the instructor (instructors seat if in an FSTD, or pilot seat if in an aircraft), except in the case of balloons. The examiner, another instructor or, for MPA in a simulator, a real crew under instruction, functions as the 'student'. The applicant is required to explain the relevant exercises and to demonstrate their conduct to the 'student', where appropriate. Thereafter, the 'student' executes the same manoeuvres (if the 'student' is the examiner or another instructor, this can include typical mistakes of inexperienced students). The applicant is expected to correct mistakes orally or, if necessary, by intervening physically.

5. The assessment of competence should also include additional demonstration exercises, as decided by the examiner and agreed upon with the applicant before the assessment. These additional exercises should be related to the training requirements for the applicable instructor certificate

6. All relevant exercises should be completed within a period of 6 months. However, all exercises should, where possible, be completed on the same day. In principle, failure in any exercise requires a retest covering all exercises, with the exception of those that may be retaken separately. The examiner may terminate the assessment at any stage if they consider that a retest is required.

AMC No 2 to FCL.935

Assessment of competence – MCCI, STI, MI

In the case of the MCCI, STI and MI, the instructor competencies are assessed continuously during the training course.

AMC No 3 to FCL.935

Assessment of competence – FI

1. In the case of the FI, the content of the assessment of competence should be the following:

SECTION 1 THEORETICAL KNOWLEDGE ORAL	
1.1	Air law
1.2	Aircraft General Knowledge
1.3	Flight Performance and Planning
1.4	Human Performance and Limitations
1.5	Meteorology
1.6	Navigation
1.7	Operational Procedures
1.8	Principles of Flight
1.9	Training Administration

SECTIONS 2 AND 3 SELECTED MAIN EXERCISES:

SECTION 2 PRE-FLIGHT BRIEFING	
2.1	Visual Presentation
2.3	Technical Accuracy
2.4	Clarity of Explanation
2.5	Clarity of Speech
2.6	Instructional Technique
2.7	Use of Models and Aids
2.8	Student Participation
SECTION 3 FLIGHT	
3.1	Arrangement of Demo
3.2	Synchronisation of Speech with Demo
3.3	Correction of Faults

3.4	**Aircraft Handling**
3.5	**Instructional Technique**
3.6	**General Airmanship/Safety**
3.7	**Positioning, use of Airspace**
SECTION 4 MULTI-ENGINE EXERCISES	
4.1	[1]**Actions following an Engine failure shortly after take-off**
4.2	[1]**A single-engine approach and go around**
4.3	[1]**A single-engine approach and landing**

[1] **These exercises are to be demonstrated at the assessment of competence for FI for multi-engine aircraft.**

SECTION 5 POST-FLIGHT DE-BRIEFING	
5.1	**Visual Presentation**
5.2	**Technical Accuracy**
5.3	**Clarity of Explanation**
5.4	**Clarity of Speech**
5.5	**Instructional Technique**
5.6	**Use of Models and Aids**
5.7	**Student Participation**

2. Section 1, the oral theoretical knowledge examination part of the assessment of competence, is for all FI and is subdivided into two parts:

2.1 The applicant is required to give a lecture under test conditions to other 'student(s)', one of whom will be the examiner. The test lecture is to be selected from items of Section 1. The amount of time for preparation of the test lecture is agreed upon beforehand with the examiner. Appropriate literature may be used by the applicant. The test lecture should not exceed 45 minutes.

2.2 The applicant is tested orally by an examiner for knowledge of items of Section 1 and the 'core instructor competencies - teaching and learning' content given in the instructor courses.

3. Sections 2, 3 and 5 are for all FI. These sections comprise exercises to demonstrate the ability to be an FI (i.e. instructor demonstration exercises) chosen by the examiner from the flight syllabus of the FI training courses. The applicant is required to demonstrate FI abilities, including briefing, flight instruction and de-briefing.

4. Section 4 comprises additional instructor demonstration exercises for an FI for multi-engine aircraft. This section, if applicable, is done in a multi-engine aircraft, or a FFS or FNPT II simulating a multi-engine aircraft. This section is completed in addition to Sections 2, 3 and 5.

AMC No 4 to FCL.935

Assessment of competence – SFI

The assessment should consist of at least 3 hours of flight instruction related to the duties of an SFI on the applicable FFS or FTD 2/3.

AMC No 5 to FCL.935

Report forms for the instructor certificates

~~AMC No 1 to Appendix 12~~

1. ~~Skill test and proficiency check~~**Assessment of competence** form for the ~~flight instructor certificate~~ **FI, IRI, CRI certificates**

~~**A. Aeroplanes**~~

APPLICATION AND REPORT FORM FOR THE INSTRUCTOR ~~SKILL TEST~~ASSESSMENT OF COMPETENCE			
1	**Applicants personal particulars:**		
Applicant's last name:		First names:	
Date of Birth:		Tel (Home):	Tel (Work):
Address:		Country:	

2	**Licence Details**		
Licence type:		Number:	
Class ratings included in the licence:		Exp. Date:	
Type ratings included in the licence:	1.		
	2.		
	3.		
	4.		
	5.		
Other ratings included in the licence:	1.		
	2.		
	3.		
	4.		
	5.		

3	**Pre-course flying experience**			
TOTAL FLYING HOURS	PIC **SEP/ TMG** hours	SINGLE-ENGINE (PISTON) preceding 6 months	INSTRUMENT FLIGHT INSTRUCTION	CROSS-COUNTRY hours

4	**Pre-entry flight test**

I recommend ....for the Flight Instructor Course.	
Name of ATO:	Date of flight test:
Name of FI conducting the test (Block capitals):	
Licence number:	
Signature:	

5	**Declaration by the applicant**

I have received a course of training in accordance with the syllabus ~~approved by the Authority~~ for the:
(Tick as applicable)

Flight Instructor Certificate FI(A)**/(H)/(As)**		Instrument Rating Instructor Certificate (IRI(A)**/(H)/(As)**)		Class Rating Instructor Certificate ~~for multi- engine SPA –~~ (CRI(A)~~ ME SPA~~)	

Applicant's name: (Block Letters)	Signatur e:

6	**Declaration by the chief flight instructor**

I certify that .... has satisfactorily completed an approved course of training for the

Flight Instructor Certificate FI(A) **/ (H) ~~/~~ (~~A~~As))**		Instrument Rating Instructor Certificate (IRI(A) **/ (H) / (As)**)		Class Rating Instructor Certificate~~ for multi- engine SPA –~~(CRI(A)**)**~~ ME SPA)~~	

in accordance with the relevant syllabus ~~approved by the Authority~~.

Flying hours during the course:	
~~Aeroplane/s~~**Aircraft or FSTDs** ~~, simulator/s or flight and navigation procedure trainers~~ used :	
Name of CFI:	
Signature:	
Name of ATO:	

7	**Flight instructor examiner's certificate**

I have tested the applicant according to ~~Appendix 12~~ to Part-FCL

A – FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT in case of partial pass:	
Theoretical oral examination:	Skill test:

Passed		Failed	Passed	Failed
	I recommend further flight/ground training with a**n** ~~FI~~ instructor before re-test			
	I do not consider further flight/theoretical instruction necessary before re-test *Tick as applicable*			
B – FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT:				
	Flight Instructor certificate			
	Instrument **rating** Instructor certificate			
	Class Rating Instructor Certificate ~~for multi-engine SPA~~ *Tick as applicable*			
FIE's name (block letters):				
Signature:				
Licence number:			Date:	

~~**B. Helicopters**~~

~~**APPLICATION AND REPORT FORM FOR THE FI(H) SKILL TEST**~~			
~~**1**~~	~~**Applicants personal particulars:**~~		
~~Applicant's last name:~~		~~First names:~~	
~~Date of Birth:~~		~~Tel (Home):~~	~~Tel (Work):~~
~~Address:~~		~~Country:~~	
~~**2**~~	~~**Licence Details**~~		
~~Licence type:~~		~~Number:~~	
		~~Exp. Date:~~	
~~Type ratings included in the licence:~~	~~1.~~		
	~~2.~~		
	~~3.~~		
	~~4.~~		
	~~5.~~		
~~Other ratings included in the licence:~~	~~1.~~		
	~~2.~~		
	~~3.~~		

	~~4.~~
	~~5.~~

~~3~~	**~~Pre-course flying experience~~**

~~IR (hours)~~	~~PIC (hours)~~	~~TOTAL (hours)~~	~~CROSS-COUNTRY (hours)~~

~~4~~	**~~Pre-entry flight test~~**

~~I recommend ....for the Flight Instructor Course.~~

~~Name of ATO:~~	~~Date of flight test:~~
~~Name of FI conducting the test (Block capitals):~~	
~~Licence number:~~	
~~Signature:~~	

~~5~~	**~~Declaration by the applicant~~**

~~I have received a course of training in accordance with the syllabus approved by the Authority for the:~~

~~(Tick as applicable)~~

~~Flight Instructor Certificate FI(H)~~		~~Instrument Rating Instructor Certificate (IRI(H))~~			

~~Applicant's name:~~ ~~(Block Letters)~~		~~Signature:~~	

~~6~~	**~~Declaration by the chief flight instructor~~**

~~I certify that .... has satisfactorily completed an approved course of training for the~~

~~Flight Instructor Certificate FI(H)~~		~~Instrument Rating Instructor Certificate (IRI(H))~~			

~~*in accordance with the relevant syllabus approved by the Authority.*~~
~~Flying hours during the course:~~
~~Helicopter/s, flight simulator/s or flight and navigation procedure trainers used :~~
~~Name of CFI:~~
~~Signature:~~
~~Name of ATO:~~

~~**7**~~	~~**Flight instructor examiner's certificate**~~		
~~***I have tested the applicant according to Appendix 12 to Part-FCL***~~			
~~**A – FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT in case of partial pass:**~~			
~~Theoretical oral examination:~~		~~Skill test:~~	
~~***Passed***~~	~~***Failed***~~	~~***Passed***~~	~~***Failed***~~

	~~I recommend further flight/ground training with a FI instructor before re-test~~
	~~I do not consider further flight/theoretical instruction necessary before re-test~~ ~~*Tick as applicable*~~
~~**B – FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT:**~~	
	~~Flight Instructor certificate~~
	~~Instrument Instructor certificate~~ ~~*Tick as applicable*~~
~~FIE's name (block letters):~~	
~~Signature:~~	
~~Licence number:~~	~~Date:~~

~~C. Airships~~

~~**APPLICATION AND REPORT FORM FOR THE INSTRUCTOR SKILL TEST (AIRSHIPS)**~~			
~~**1**~~	~~**Applicants personal particulars:**~~		
~~Applicant's last name:~~		~~First names:~~	

~~Date of Birth:~~		~~Tel (Home):~~	~~Tel (Work):~~
~~Address:~~		~~Country:~~	

~~2~~	~~**Licence Details**~~		
~~Licence type:~~		~~Number:~~	
~~Type ratings included in the licence:~~	~~1.~~	~~Exp. Date:~~	
	~~2.~~		
	~~3.~~		
	~~4.~~		

~~3~~	~~**Pre-course flying experience**~~			
~~TOTAL FLYING HOURS~~	~~PIC hours~~	~~PIC hours holding a CPL(As)~~		

~~4~~	~~**Pre-entry flight test**~~
~~***I recommend ....for the Flight Instructor Course.***~~	
~~Name of ATO:~~	~~Date of flight test:~~
~~Name of FI conducting the test (Block capitals):~~	
~~Licence number:~~	
~~Signature:~~	

~~5~~	~~**Declaration by the applicant**~~			
~~***I have received a course of training in accordance with the syllabus approved by the Authority for the:***~~ ~~***(Tick as applicable)***~~				
~~Flight Instructor Certificate FI(As)~~		~~Instrument Rating Instructor Certificate (IRI(As))~~		
~~Applicant's name: (Block Letters)~~		~~Signature:~~		

~~6~~	~~**Declaration by the chief flight instructor**~~
~~***I certify that .... has satisfactorily completed an approved course of training for the***~~	

<table>
<tr><td>~~Flight Instructor Certificate FI(As)~~</td><td></td><td>~~Instrument Rating Instructor Certificate (IRI(As))~~</td><td></td><td colspan="3"></td></tr>
<tr><td colspan="7">***~~in accordance with the relevant syllabus approved by the Authority.~~***</td></tr>
<tr><td colspan="3">~~Flying hours during the course:~~</td><td colspan="4"></td></tr>
<tr><td colspan="7">~~Airship/s, simulator/s or flight and navigation procedure trainers used :~~</td></tr>
<tr><td colspan="7">~~Name of CFI:~~</td></tr>
<tr><td colspan="7">~~Signature:~~</td></tr>
<tr><td colspan="7">~~Name of ATO:~~</td></tr>
<tr><td>**~~7~~**</td><td colspan="6">**~~Flight instructor examiner's certificate~~**</td></tr>
<tr><td colspan="7">***~~I have tested the applicant according to Appendix 12~~***</td></tr>
<tr><td colspan="7">**~~A – FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT in case of partial pass:~~**</td></tr>
<tr><td colspan="3">~~Theoretical oral examination:~~</td><td colspan="4">~~Skill test:~~</td></tr>
<tr><td>***~~Passed~~***</td><td colspan="2">***~~Failed~~***</td><td colspan="2">***~~Passed~~***</td><td colspan="2">***~~Failed~~***</td></tr>
<tr><td></td><td colspan="6">~~I recommend further flight/ground training with a FI instructor before re-test~~</td></tr>
<tr><td></td><td colspan="6">~~I do not consider further flight/theoretical instruction necessary before re-test~~
~~Tick as applicable~~</td></tr>
<tr><td colspan="7">**~~B – FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT:~~**</td></tr>
<tr><td></td><td colspan="6">~~Flight Instructor certificate~~</td></tr>
<tr><td></td><td colspan="6">~~Instrument Instructor certificate~~
~~Tick as applicable~~</td></tr>
<tr><td colspan="7">~~FIE's name (block letters):~~</td></tr>
<tr><td colspan="7">~~Signature:~~</td></tr>
<tr><td colspan="5">~~Licence number:~~</td><td colspan="2">~~Date:~~</td></tr>
</table>

~~D. Sailplanes~~

~~The AMC No 2 to Appendix 12 (Skill test and proficiency check form for the Light Aircraft Flight Instructor certificate) should be used.~~

~~E. Balloons~~

~~The AMC No 2 to Appendix 12 (Skill test and proficiency check form for the Light Aircraft Flight Instructor certificate) should be used.~~

~~AMC No 2 to Appendix 12~~

2. ~~Skill test and proficiency check~~**Assessment of competence** form for the Light Aircraft Flight Instructor certificate

~~A. Aeroplanes~~

APPLICATION AND REPORT FORM FOR THE LIGHT AIRCRAFT FLIGHT INSTRUCTOR SKILL TEST (LAFI~~(A)~~)

1	**Applicants personal particulars:**		
Applicant's last name:		First names:	
Date of Birth:		Tel (Home):	Tel (Work):
Address:		Country:	

2	**Licence Details**		
Licence type:		Number:	
Class included in the licence:	1.	Exp. Date:	
	2.	Exp. Date:	
Ratings included in the licence:	1.		
	2.		
	3.		

3	**Pre-course flying experience**			
TOTAL FLYING HOURS ~~(SEP and TMG)~~	PIC hours	S**INGLE ENGINE PISTON/TMG/ HELICOPTER TYPE hours** ~~total and preceding 6 months~~	INSTRUMENT FLIGHT INSTRUCTION	CROSS-COUNTRY hours

4	**Pre-entry flight test**
I recommend ....for the Light Aircraft Flight Instructor Course.	
Name of ATO:	Date of flight test:
Name of FI conducting the test (Block capitals):	
Licence number:	

Signature:					
5	**Declaration by the applicant**				
I have received a course of training in accordance with the syllabus ~~approved by the Authority~~ for the:					
Light Aircraft Flight Instructor Certificate LAFI(A)**/(H)**					
Applicant's name: (Block Letters)			Signature:		
6	**Declaration by the chief flight instructor**				
I certify that .... has satisfactorily completed a~~n approved~~ course of training for the					
Light Aircraft Flight Instructor Certificate LAFI~~(A)~~					
in accordance with the relevant syllabus ~~approved by the Authority~~.					
Flying hours during the course:					
~~Aeroplane/s, simulator/s or flight and navigation procedure trainers~~**Aircraft and FSTDs** used :					
Name of CFI:					
Signature:					
Name of ATO:					
7	**Flight instructor examiner's certificate**				
I have tested the applicant according to ~~Appendix 12~~ Part-FCL					
A – ~~LIGHT AIRCRAFT~~ FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT in case of partial pass:					
Theoretical oral examination:			Skill test:		
Passed		***Failed***	***Passed***		***Failed***
	I recommend further flight/ground training with a**n instructor** ~~LAFI or FI~~ before re-test				
	I do not consider further flight/theoretical instruction necessary before re-test *Tick as applicable*				
B – FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT:					
	Light Aircraft Flight Instructor Certificate				

FIE’s name (block letters):	
Signature:	
Licence number:	Date:

~~B. Helicopters~~

~~APPLICATION AND REPORT FORM FOR THE LAFI(H) SKILL TEST~~			
~~1~~	**~~Applicants personal particulars:~~**		
~~Applicant’s last name:~~		~~First names:~~	
~~Date of Birth:~~		~~Tel (Home):~~	~~Tel (Work):~~
~~Address:~~		~~Country:~~	
~~2~~	**~~Licence Details~~**		
~~Licence type:~~		~~Number:~~	
		~~Exp. Date:~~	
~~Ratings included in the licence:~~	~~1.~~		
	~~2.~~		
	~~3.~~		
~~3~~	**~~Pre-course flying experience~~**		
~~IR (hours)~~	~~PIC~~ ~~(hours total and on type)~~	~~TOTAL~~ ~~(hours)~~	~~CROSS-COUNTRY~~ ~~(hours)~~
~~4~~	**~~Pre-entry flight test~~**		
~~I recommend ....for the Light Aircraft Flight Instructor Course.~~			
~~Name of ATO:~~	~~Date of flight test:~~		
~~Name of FI conducting the test (Block capitals):~~			
~~Licence number:~~			
~~Signature:~~			

~~5~~	~~**Declaration by the applicant**~~				
~~***I have received a course of training in accordance with the syllabus approved by the Authority for the:***~~ ~~*(Tick as applicable)*~~					
~~Light Aircraft Flight Instructor Certificate LAFI(H)~~					
~~Applicant's name:~~ ~~(Block Letters)~~		~~Signature:~~			

~~6~~	~~**Declaration by the chief flight instructor**~~				
~~***I certify that .... has satisfactorily completed an approved course of training for the***~~					
~~Flight Instructor Certificate FI(H)~~					
~~*in accordance with the relevant syllabus approved by the Authority.*~~					
~~Flying hours during the course:~~					
~~Helicopter/s, flight simulator/s or flight and navigation procedure trainers used :~~					
~~Name of CFI:~~					
~~Signature:~~					
~~Name of ATO:~~					

~~7~~	~~**Flight instructor examiner's certificate**~~		
~~***I have tested the applicant according to Appendix 12***~~			
~~**A – LIGHT AIRCRAFT FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT in case of partial pass:**~~			
~~Theoretical oral examination:~~		~~Skill test:~~	
~~***Passed***~~	~~***Failed***~~	~~***Passed***~~	~~***Failed***~~

	~~I recommend further flight/ground training with a LAFI / FI instructor before re-test~~
	~~I do not consider further flight/theoretical instruction necessary before re-test~~ ~~*Tick as applicable*~~

~~B – LIGHT AIRCRAFT FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT:~~		
	~~Light Aircraft Flight Instructor certificate~~	
~~FIE's name (block letters):~~		
~~Signature:~~		
~~Licence number:~~		~~Date:~~

3~~C~~. Report form for the LAFI and FI for Sailplanes

APPLICATION AND REPORT FORM FOR THE LAFI(S) / FI(S) ASSESSMENT OF COMPETENCE ~~SKILL TEST~~			
1	**Applicants personal particulars:**		
Applicant's last name:		First names:	
Date of Birth:		Tel (Home):	Tel (Work):
Address:		Country:	

2	**Licence Details**		
Licence type:		Number:	
TMG extension:			

3	**Pre-course flying experience**			
TOTAL HOURS	PIC hours	SAILPLANE (PIC hours and take offs)	TOURING MOTOR GLIDER (PIC hours and take offs)	

4	**Pre-entry flight test**
I recommend ....for the Flight Instructor / Light Aircraft Flight Instructor Course.	
Name of ATO:	Date of flight test:
Name of LAFI / FI conducting the test (Block capitals):	
Licence number:	
Signature:	

5	**Declaration by the applicant**				
I have received a course of training in accordance with the syllabus ~~approved by the Authority~~ for the:					
Light Aircraft Flight Instructor Certificate LAFI(S)		Flight Instructor Certificate FI(S)			
Applicant's name: (Block Letters)			Signature:		

6	**Declaration by the chief flight instructor**				
I certify that .... has satisfactorily completed a~~n~~ ~~approved~~ course of training for the					
Light Aircraft Flight Instructor Certificate LAFI(**S**~~A~~)		Flight Instructor Certificate FI(S)			
in accordance with the relevant syllabus ~~approved by thee Authority~~.					
Flying hours during the course:			Take-offs during the course:		
Sailplanes / powered sailplanes / touring motor gliders used :					
Name of CFI:					
Signature:					
Name of ATO:					

7	~~**Light Aircraft Flight instructor /**~~ **Flight Instructor examiner's certificate**		
I have tested the applicant according to ~~Appendix 12~~Part-FCL			
A – ~~LIGHT AIRCRAFT FLIGHT INSTRUCTOR /~~ FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT in case of partial pass:			
Theoretical oral examination:		Skill test:	
Passed	***Failed***	***Passed***	***Failed***
	I recommend further flight/ground training with a LAFI / FI before re-test		
	I do not consider further flight/theoretical instruction necessary before re-test *Tick as applicable*		
B – ~~LIGHT AIRCRAFT FLIGHT INSTRUCTOR /~~ FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT:			
	Light Aircraft Flight Instructor certificate / Flight Instructor certificate		
	Date:		

FIE's name (block letters):	
Signature:	
Licence number:	Date:

4~~D~~. Report form for the LAFI and FI for Balloons

APPLICATION AND REPORT FORM FOR THE LAFI(B) / FI(B) ~~SKILL TEST~~ASSESSMENT OF COMPETENCE				
1	**Applicants personal particulars:**			
Applicant's last name:		First names:		
Date of Birth:		Tel (Home):	Tel (Work):	
Address:		Country:		
2	**Licence Details**			
Licence type:		Number:		
Class extensions:	1.	Groups:		
	2.	Groups:		
	3.	Groups:		
3	**Pre-course flying experience**			
TOTAL FLYING HOURS **in different groups**	PIC hours	HOT AIR BALLOON	GAS BALLOON	HOT AIR AIRSHIP
~~*small*~~				
~~*mdium*~~				
~~*large*~~				
4	**Pre-entry flight test**			
I recommend ....for the Light Aircraft Flight Instructor / Flight Instructor course				
Name of ATO:		Date of flight test:		
Name of LAFI / FI conducting the test (Block capitals):				
Licence number:				
Signature:				

5	**Declaration by the applicant**				
I have received a course of training in accordance with the syllabus ~~approved by the Authority~~ for the:					
Light Aircraft Flight Instructor Certificate LAFI(B)		Flight Instructor Certificate FI(B)			
Applicant's name: (Block Letters)			Signature:		

6	**Declaration by the chief flight instructor**			
I certify that .... has satisfactorily completed a~~n~~ ~~approved~~ course of training for the				
Light Aircraft Flight Instructor Certificate LAFI(**B**~~A~~)		Flight Instructor Certificate FI(B)		
in accordance with the relevant syllabus ~~approved by the Authority~~.				
Flying hours during the course:		Take-offs during the course:		
Balloons, hot-air airships used :				
Name of CFI:				
Signature:				
Name of ATO:				

7	**~~Light Aircraft Flight instructor /~~ Flight Instructor examiner's certificate**		
I have tested the applicant according to ~~Appendix 12~~Part-FCL			
A – ~~LIGHT AIRCRAFT FLIGHT INSTRUCTOR /~~ FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT in case of partial pass:			
Theoretical oral examination:		Skill test:	
Passed	***Failed***	***Passed***	***Failed***
	I recommend further flight/ground training with a LAFI or FI before re-test		
	I do not consider further flight/theoretical instruction necessary before re-test *Tick as applicable*		
B – FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT:			
	Light Aircraft Flight Instructor Certificate / Flight Instructor Certificate		
FIE's name (block letters):			
Signature:			
Licence number:		Date:	

AMC to FCL.930.LAFI

Light Aircraft Flight Instructor (LAFI) training course

GENERAL

1. The aim of the LAFI course is to train leisure pilot licence holders to the level of competence defined in FCL.920 as instructor competencies.

2. The course should develop safety awareness throughout by teaching the knowledge, skills and attitudes relevant to the LAFI task including at least the following:

a. refresh the technical knowledge of the student instructor;

b. train the student instructor to teach the ground subjects and air exercises;

c. ensure that the student instructor's flying is of a sufficiently high standard; and

d. teach the student instructor the principles of basic instruction and to apply them at the L**A**PL level.

COURSE CONTENT

3. With the exception of the section on Teaching and Learning, all the subject detail contained in the Ground and Flight Training Syllabus is complementary to the L**A**PL course syllabus**.**~~ and should already be known by the applicant.~~

4. The LAFI course should give particular stress to the role of the individual in relation to the importance of human factors in the man-machine and theoretical knowledge environment interaction. Special attention should be paid to the applicant's maturity and judgement including an understanding of adults, their behavioural attitudes and variable levels of education.

5. During the course, the applicants should be made aware of their own attitudes to the importance of flight safety. Improving safety awareness should be a fundamental objective throughout the course. It will be of major importance for the course of training to aim at giving applicants the knowledge, skills and attitudes relevant to a flight instructor's task.

6. On successful completion of the course and final test the applicant may be issued with a LAFI certificate.

7. The course consists of 2 parts:

- Part 1 **Theoretical knowledge instruction, including t**~~T~~eaching and **l**~~L~~earning instruction (should comply with AMC to FCL.920)
- Part 2 Flight instruction

PART 1

TEACHING AND LEARNING

8. The course should include at least 75 hours of theoretical knowledge **including at least 25 hours teaching and learning instructions**~~and instructional techniques~~ for the LAFI (A) and (H) certificate and at least **55**~~30~~ hours of theoretical knowledge **including at least 25 hours teaching and learning instructions**~~and instructional techniques~~ for the LAFI (S) and (B) certificate.

CONTENT OF THE **TEACHING AND LEARNING INSTRUCTIONS (**INSTRUCTIONAL TECHNIQUES**)**:

8.1 THE LEARNING PROCESS

Motivation

Perception and understanding

Memory and its application

Habits and transfer

Obstacles to learning

Incentives to learning

Learning methods

Rates of learning

8.2 THE TEACHING PROCESS

Elements of effective teaching

Planning of instructional activity

Teaching methods

Teaching from the ‘known’ to the ‘unknown’

Use of ‘lesson plans’

8.3 TRAINING PHILOSOPHIES

Value of a structured (approved) course of training

Importance of a planned syllabus

Integration of theoretical knowledge and flight instruction

8.4 TECHNIQUES OF APPLIED INSTRUCTION

a. Theoretical knowledge – Classroom instruction techniques

Use of training aids

Group lectures

Individual briefings

-Student participation/discussion

b. Flight – Airborne instruction techniques

The flight/cockpit environment

Techniques of applied instruction

Post-flight and in-flight judgement and decision making

8.5 STUDENT EVALUATION AND TESTING

a. Assessment of student performance

The function of progress tests

Recall of knowledge

Translation of knowledge into understanding

Development of understanding into actions

The need to evaluate rate of progress

b. Analysis of student errors

Establish the reason for errors

Tackle major faults first, minor faults second

Avoidance of over criticism

The need for clear concise communication

8.6 TRAINING PROGRAMME DEVELOPMENT

Lesson planning

Preparation

Explanation and demonstration

Student participation and practice

Evaluation

8.7 HUMAN PERFORMANCE AND LIMITATIONS RELEVANT TO FLIGHT INSTRUCTION

a. Physiological factors

Psychological factors

Human information processing

Behavioural attitudes

Development of judgement and decision making

b. Threat and error management

8.8 SPECIFIC HAZARDS INVOLVED IN SIMULATING SYSTEMS FAILURES AND MALFUNCTIONS IN THE AIRCRAFT DURING FLIGHT

Importance of 'touch drills'

Situational awareness

Adherence to correct procedures

8.9 TRAINING ADMINISTRATION

Flight/theoretical knowledge instruction records

Pilot's personal flying log book

The flight/ground curriculum

Study material

Official forms

Aircraft Flight/Owner's Manuals/Pilot's Operating Handbooks

Flight authorisation papers

Aircraft documents

The private pilot's licence regulations

PART 2

FLYING TRANING

9. An approved LAFI course should comprise at least –the minimum hours of flight instruction as defined bin FCL.930.LAFI.

AIR EXERCISES

10. The air exercises are similar to those used for the training of L**A**PL but with additional items designed to cover the needs of a flight instructor.

11. The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide: therefore the demonstrations and practices need not necessarily be given in the order listed. The actual order and content will depend upon the following interrelated factors:

The applicant's progress and ability

The weather conditions affecting the flight

The flight time available

Instructional technique considerations

The local operating environment

Applicability of the exercises to the aircraft type

12. At the discretion of the instructors some of the exercises may be combined whereas some other exercises may be done in several flights.

13. It follows that student instructors will eventually be faced with similar inter-related factors. They should be shown and taught how to construct flight lesson plans, taking these factors into account, so as to make the best use of each flight lesson, combining parts of the set exercises as necessary.

GENERAL

14. The briefing normally includes a statement of the aim and a brief allusion to principles of flight only if relevant. An explanation is to be given of exactly what air exercises are to be taught by the instructor and practised by the student during the flight. It should include how the flight will be conducted with regard to who is to fly the aircraft and what airmanship, weather and flight safety aspects currently apply. The nature of the lesson will govern the order in which the constituent parts are to be taught.

The five basic components of the briefing will be:

~~1~~**a** The aim

~~2~~**b** Airmanship

~~3~~**c** The air exercise(s) briefing (what, and how and by whom)

~~4~~**d** Flight Briefing

~~5~~**e** Check of understanding

PLANNING OF FLIGHT LESSONS

15. The preparation of lesson plans is an essential pre-requisite of good instruction and the student instructor is to be given supervised practice in the planning and practical application of flight lesson plans.

GENERAL CONSIDERATIONS

16. The student instructor should complete flight training in order to practise the principles of basic instruction at the L**A**PL level. During this training the student instructor occupies the seat normally occupied by the LAFI.

17. The instructor providing this instructor training is normally taking over the role of the student pilot. In the case of the course for the LAFI(B) an additional person holding a BPL or LAPL(B) licence or a student pilot for these licences may be on board in order to function as a student pilot under the supervision of the instructor.

18. It is to be noted that airmanship is a vital ingredient of all flight operations. Therefore, in the following air exercises the relevant aspects of airmanship are to be stressed at the appropriate times during each flight.

FLIGHT INSTRUCTION SYLLABUS CONTENTS

A. ~~Aeroplanes~~AEROPLANES

LONG BRIEFINGS AND AIR EXERCISES:

~~1 Familiarisation with the aeroplanes~~

~~2 Preparation before and action after flight~~

~~3 Air experience~~
~~4 Effects of controls~~

~~5 Taxiing~~

~~6 Straight and level flight~~

~~7 Climbing~~

~~8 Descending~~

~~9 Turning~~

~~10A Slow flight~~

~~10B Stalling~~

~~11 Spin recovery at the incipient stage~~

~~12 Take-off and climb to downwind position~~

~~13 The circuit, approach and landing~~

~~14 First solo~~

~~15 Advanced turning~~

~~16 Forced landing without power~~

~~17 Precautionary landing~~

~~18A Pilot navigation~~

~~18B Navigation at lower levels/reduced visibility~~

~~19 Introduction to instrument flying~~

~~20~~~~19 Basic night flight (if night instructional qualification required)~~

~~NOTE 1: Although exercise 11A is not required for the LPL(A) course it is a requirement for the LAFI(A) course.~~

NOTE ~~2~~: Airmanship should be included as required in each exercise.

EXERCISE 1 - AEROPLANE FAMILIARISATION

OBJECTIVE

To advise the student instructor on how to familiarise the student with the aeroplane or touring motor glider which will be used for the training and to test his position in the aircraft for comfort, visibility, and ability to use all controls and equipment.

BRIEFING AND EXERCISE

The student instructor has to:

- present the type of aeroplane which will be used
- explain the cockpit layout – instruments and equipment
- explain the aeroplane and engine systems
- explain and demonstrate the flight controls
- check the position of the student on the seat for comfort, visibility, ability to use all controls
- explain and demonstrate the use of the harness
- explain the differences when occupying the instructor's position
- explain all check lists, drills, controls

EMERGENCY DRILLS

The student instructor has to

- explain the action in the event of fire in the air and on the ground (engine/cabin/ electrical)
- explain systems failures and actions as applicable to type
- explain and demonstrate escape drills
- explain and demonstrate the location and use of emergency equipment and exits

EXERCISE 2 - PREPARATION FOR AND ACTION AFTER FLIGHT

OBJECTIVE

To advise the student instructor on how to explain and demonstrate all the operations to be completed prior to flight and how to explain the actions after flight. **Furthermore the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the need for a pre-flight briefing.
- the structure and the content of this briefing
- which documents are required on board
- which equipment are required for a flight

- how to do the pre-flight external and internal checks
- the procedure for verifying in-limits mass and balance
- the starting, warming up and power checks (check list)
- the running down and system checks / switching off the engine
- leaving of the aircraft, Parking, Security and Picketing

AIR EXERCISE

The student instructor has to prepare and ~~and~~ give a pre-flight briefing:

The student instructor has to demonstrate:

- that the required documents are on board
- that the equipment required for the intended flight is on board
- how to perform a pre-flight external and internal check
- how to verify in-limits mass and balance
- how to adjust harness as well as seat and/or rudder pedals
- the starting, warm up and power checks
- how to leave the aircraft

The student instructor also has to demonstrate:

- how to advise the student pilot in performing the pre-flight preparation
- how to analyse and correct pre-flight preparation errors of the student as necessary

EXERCISE 3 – AIR EXPERIENCE FLIGHT

OBJECTIVE

To advise the student instructor on how to familiarise the student with being in the air, with the area around the airfield, to note his/her reactions in this situation, and to draw his/her attention to safety and look-out procedures

BRIEFING

The student instructor has to explain:

- the area around the airfield
- the need for looking out

AIR EXERCISE

The student instructor has to:

- show the noteworthy references on the ground
- analyse the reactions of the student
- check that the student looks out (safety)
- demonstrate airmanship

EXERCISE 4 - EFFECTS OF CONTROLS

OBJECTIVE

To advise the student instructor on how to demonstrate the primary and further effects of each control with the help of visual references and how to demonstrate the effects of airspeed, slipstream, power, trimming controls and flaps. Furthermore the student instructor has to demonstrate the operation of mixture control, carburettor heat control and the cabin heat and/or ventilation system. The continuous and efficient look-out procedures have to be demonstrated during these exercises. **In addition to this the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to define the axes of an aeroplane / touring motor glider The student instructor has to explain:

- the look-out procedures

- the visual references along each axis

- the primary effects of controls when laterally level and banked

- the further effects of ailerons and rudder

- the effect of inertia, airspeed, slipstream, power, trimming controls and flaps

- the use of mixture control, carburettor heat control and cabin heat/ventilation systems

- the effect of other controls (as applicable)

AIR EXERCISE

The student instructor has to demonstrate:

- the visual references in flight

- the primary effect of flying controls – when laterally level and banked

- the further effects of ailerons and rudder

- the effect of inertia, airspeed, slipstream, power, trimming controls and flaps (if applicable)

- the use of mixture control, carburettor heat control and cabin heat/ventilation systems

- the look-out procedures during all the exercises

- airmanship

The student instructor also has to demonstrate:

- how to advise the student pilot to recognise the primary and further effects of each control

- how to advise the student to practice the use of flying controls

- how to analyse and correct errors as necessary

EXERCISE 5 - TAXIING

OBJECTIVES:

To advise the student instructor how to demonstrate the pre-taxiing checks, the starting procedure and how to control speed, direction, turning and stopping of the aircraft. Furthermore the student instructor should learn how to identify taxiing errors and how to correct them properly.

BRIEFING

The student instructor has to explain:

- the pre-taxiing checks
- how to start and how to control the speed and stopping
- the engine handling
- the control of direction and turning (including manoeuvring in confined spaces)
- the parking area procedures and precautions
- the effects of wind and use of flying controls
- effects of ground surface
- freedom of rudder movement
- the marshalling signals
- the instrument checks
- the Air Traffic Control procedures

EMERGENCIES

The student instructor has to explain:

- steering failures / brake failure and suitable actions

AIR EXERCISE

The student instructor has to demonstrate:

- how to perform the pre-taxiing checks (use of checklist)
- how to perform starting, control of speed and stopping of the aircraft
- the freedom of rudder movement
- the instrument checks
- the handling of the engine
- the control of direction and turning
- turning in confined spaces
- how to use the flying controls during taxiing (effects of wind)
- how to follow the parking area procedures and precaution actions
- the effects of ground surface
- the look-out procedures during taxiing
- airmanship

The student instructor also has to demonstrate:

- how to advise the student pilot to perform the pre-taxiing checks and engine starting procedures

- how to advise the student pilot to perform the taxiing techniques
- how to identify errors and how to correct them

EMERGENCIES

The student instructor also has to demonstrate:

- how to react on steering failures or brake failures

EXERCISE 6 - STRAIGHT AND LEVEL FLIGHT

OBJECTIVES

To advise the student instructor on how to train the student to maintain straight and level flight with a constant heading without slipping and skidding. **Furthermore the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the longitudinal stability and control in pitch
- the relationship of c of g to control in pitch
- lateral and directional stability (control of lateral level and balance)
- attitude and balance control
- how to use the trim
- the different power settings and related airspeeds
- the drag and power curves
- range and endurance

AIR EXERCISE

The instructor student has to demonstrate:

- attaining and maintaining straight and level flight (at normal cruising power)
- inherent stability
- the control of the aircraft in pitch, including use of elevator trim control
- the control of lateral level, direction and balance, the use of rudder trim controls as applicable
- the effect of drag and use of power (at selected airspeeds)
- straight and level flight in different aircraft configurations (flaps, landing gear)
- the use of instruments to achieve precision flight
- the look-out procedures during all the exercises

The student instructor also has to demonstrate:

- how to advise the student pilot to attain and maintain straight and level flight
- how to analyse and correct errors as necessary
- airmanship

EXERCISE 7 – CLIMBING

OBJECTIVES

To advise the student instructor on how to train the entry and maintain the normal maximum rate of climb, the cruise climb and the levelling off at a certain altitude. **Furthermore the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the forces
- the relationship between power/airspeed and rate of climb (maximum rate of climb (Vy))
- the effect of mass
- the effect of flaps
- engine considerations
- the effect of density altitude
- the cruise climb
- the maximum angle of climb (Vx)

AIR EXERCISE

The student instructor has to demonstrate:

- the entry and maintaining of the normal maximum rate of climb
- the levelling off procedure
- levelling off at selected altitudes
- climbing with flaps down
- the recovery to normal climb
- en route climb (cruise climb)
- the maximum angle of climb
- the use of instruments to achieve precision flight

The student instructor also has to demonstrate:

- how to advise the student pilot to entry and maintain the normal and maximum rate of climb
- how to advise the student pilot to perform the cruise climb and the levelling off at a certain altitude
- how to analyse and correct errors as necessary
- airmanship

EXERCISE 8 - DESCENDING

OBJECTIVES:

To advise the student instructor on how to train how to perform the descend entry, to maintain the glide (with different configurations) and how to perform levelling off at selected altitudes. **Furthermore the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the forces
- the glide descent angle – airspeed – rate of Descent
- the effect of flaps
- the effect of wind
- the effect of mass
- the engine considerations
- the power assisted descent – power/airspeed – rate of descent
- the cruise descent
- the sideslip

AIR EXERCISE

The student instructor has to demonstrate:

- how to perform the entry and how to maintain the glide
- the levelling off procedure
- the levelling off at selected altitudes
- how to descend with flaps down
- how to perform a powered descent – cruise descent (inc. effect of power/airspeed)
- how to perform side slipping (on suitable types)
- the use of Instrument to achieve precision flight

The student instructor also has to demonstrate:

- how to advise the student pilot to entry and maintain a continuous glide
- how to advise the student pilot to perform the levelling off at a certain altitude
- how to analyse and correct errors as necessary
- airmanship

EXERCISE 9 - TURNING

OBJECTIVES:

To advise the student instructor on how to teach student pilots to fly medium level turns with constant bank and coordinated flight, climbing and descending turns and how to perform turning onto selected heading. **Furthermore the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the forces
- the use of controls
- the use of power
- the maintenance of attitude and balance
- medium Level Turns
- climbing and descending turns
- slipping turns
- turning onto selected headings (use of gyro heading indicator and/or magnetic compass)

AIR EXERCISE

The student instructor has to demonstrate:

- the entry and maintaining medium level turns
- straight flight
- climbing turns
- descending turns
- slipping turns (on suitable types)
- turns to selected headings (use of gyro heading indicator and/or compass)
- the use of instruments to achieve precision flight

The student instructor also has to demonstrate:

- how to advise the student pilot to entry and maintain medium level turns
- how to advise the student pilot to perform climbing and descending turns
- how to advise the student pilot to turn onto selected headings
- how to analyse and correct faults in the turn (incorrect Pitch, Bank, Balance) as necessary
- airmanship

THE STALL / SPIN AWARENESS AND AVOIDANCE TRAINING CONSISTS OF EXERCISES:

10 A, 10 B and 11

EXERCISE 10 A - SLOW FLIGHT

OBJECTIVES:

To advise the student instructor on how to improve the student's ability to recognise inadvertent flight at critically low speeds (high angle of attack) and to provide practice in maintaining the sailplane in balance while returning to normal attitude (speed). **Furthermore the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the aeroplane handling characteristics during slow flight at

    Vs1 & Vso + 10 knots

    Vs1 & Vso + 5 knots

- the slow flight during instructor induced distractions
- the effect of overshooting in "nose-up" trim configurations

AIR EXERCISE

The student instructor has to demonstrate:

- the safety checks
- the introduction to slow flight
- the controlled slow flight in the clean configuration at:

    Vs1 + 10 knots & with flaps down

    Vso + 10 knots:

    straight & level flight

    level turns

    climbing and descending

    climbing and descending turns

- the controlled slow flight in the clean configuration at:

    Vs1 + 5 knots and with flaps down

    Vso + 5 knots:

    straight and level flight

    level turns

    climbing and descending

    climbing and descending turns

    descending 'unbalanced' turns at low airspeed

- 'instructor induced distractions' during flight at low airspeed
- the need to maintain Balanced Flight and a safe Airspeed
- the effect of going around with strong "nose up" configurations

The student instructor also has to demonstrate:

- how to advise the student pilot to recognise inadvertent flight at critically low speeds
- how to advise the student pilot to perform the controlled slow flight in the different configurations
- how to advise the student to maintain balanced flight and a safe airspeed
- how to analyse and correct errors as necessary
- airmanship

EXERCISE 10 B - STALLING

OBJECTIVES:

To advise the student Instructor on how to improve the student's ability to recognize a stall and to recover from it. This includes stalling and recovery at the incipient stage with "instructor induced" distractions. **Furthermore**, **the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the characteristics of the stall
- the angle of attack
- the effectiveness of the controls at the stall
- the factors affecting the stalling speed
- the symptoms of the stall
- stall recognition and recovery
- stalling and recovery (different configurations):
- the recovering from Incipient stalls (in different configurations and conditions)
- the recovering at the Incipient Stage during Change of Configuration
- the stalling and recovery at the incipient stage with 'instructor induced' distractions

* Consideration is to be given to manoeuvre limitations and references to The Owners/Flight manual or Pilot's Operating Handbook in relation to Mass and Balance limitations. These factors are also covered in the next exercise Spinning.

AIR EXERCISE

The student instructor has to demonstrate:

- the safety checks
- the symptoms of the stall
- the stall recognition and recovery
- the recovery without power / with power
- the recovery when a wing drops at the stall
- stalling with power 'on' and recovery
- stalling with flaps 'down' and recovery
- the maximum power climb (straight / turning flight) to the point of stall with uncompensated yaw
- the effect of unbalance at the stall when climbing power is being used
- stalling and recovery during manoeuvres involving more than 1 g
- recoveries from incipient stalls in the landing and other configurations / conditions
- recoveries at the incipient stage during change of configuration

The student instructor also has to demonstrate:

- how to advise the student pilot to recognise a stall and to recover from it

- how to perform instructor induced distractions during stalling

- how to analyse and correct errors as necessary

- airmanship

* Consideration of manoeuvre limitations and the need to refer to the Aeroplane Manual and Weight (mass) and Balance calculations. These factors are to be covered in the next exercise – Spinning.

EXERCISE 11 - SPIN RECOVERY at the INCIPIENT STAGE

OBJECTIVES:

To advise the student Instructor on how to improve the student's ability to recognize a spin at the incipient stage and how to recover from it. **Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the causes, stages, autorotation and characteristics of the spin

- the recognition and recovery at the incipient stage – entered from various flight attitudes

- the aeroplane limitations

AIR EXERCISE

The student instructor has to demonstrate:

- the safety checks

- recognition at the Incipient Stage of a Spin

- recoveries from incipient spins entered from various attitudes (clean configuration)

- instructor induced distractions

- the use of controls

- the effects of power/flaps (restrictions applicable to aeroplane type)

- spinning and recovery from various flight attitudes

The student instructor also has to demonstrate:

- how to advise the student pilot to recognise the spin

- how to improve the student pilot's ability to recover from the spin

- how to analyse and correct errors as necessary

- airmanship

EXERCISE 12 - TAKE-OFF AND CLIMB TO DOWNWIND POSITION

OBJECTIVES:

To advise the student Instructor on how to improve the student's ability to perform the checks and drills before during and after take-off and how to perform the different take off techniques. This includes the student pilot's ability to deal with emergency situations during take-off and climb. **Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the handling – factors affecting the length of take-off run and initial climb
- the correct lift off speed, use of elevators (safeguarding the nose wheel), rudder and power
- the effect of wind (including crosswind component)
- the effect of flaps (including the decision to use and the amount permitted)
- the effect of ground surface and gradient upon the take-off run
- the effect of mass, altitude and temperature on take-off and climb performance
- the pre take-off checks
- the air traffic control procedure (before take-off)
- the drills, during and after take-off
- noise abatement procedures
- tail wheel considerations (as applicable)
- short/soft field take-off considerations/procedures

EMERGENCIES:

Aborted Take-Off

Engine Failure after Take-Off

Airmanship and Air Traffic Control Procedures

Common Errors

AIR EXERCISE 12

The student instructor has to demonstrate:

- how to perform the pre take-off checks
- the into wind take-off
- how to safeguard the nose wheel
- how to perform a crosswind take-off
- perform the drills during and after take-off
- a short take-off and soft field procedures/techniques (including performance calculations)
- noise abatement procedures

The student instructor also has to demonstrate:

- how to advise the student pilot to perform the checks and drills

- how to advise the student pilot to perform the different take-off techniques
- how to analyse and correct errors as necessary
- airmanship

EXERCISE 13 - THE CIRCUIT APPROACH AND LANDING

OBJECTIVES:

To advise the student instructor on how to teach a student to fly a safe circuit approach and to land the aeroplane. **Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the downwind leg, base leg, approach – position and drills
- the factors affecting the final approach and the landing run
- the effect of mass
- the effects of altitude and temperature
- the effect of wind
- the effect of flap
- the landing
- the effect of ground surface and gradient upon the landing run
- the types of approach and landing:
    - powered
    - crosswind
    - flapless (at an appropriate stage of the course)
    - glide
    - short field
    - soft field
- tail wheel considerations (as applicable)
- the missed approach / go around
- the engine handling
- wake turbulence / windshear awareness
- the air traffic control procedures
- the special emphasis on lookout

AIR EXERCISE

The student instructor has to demonstrate:

- how to perform the normal circuit procedures
- a powered approach and landing
- how to safeguard the nosewheel

- the effect of wind on approach, touchdown speeds and the use of Flaps
- how to perform a crosswind approach and landing
- the glide approach and landing
- the flapless approach and landing (short and soft field)
- the short field and soft field procedures
- the wheel landing (tail wheel aircraft)
- the missed approach/go around procedure
- the noise abatement procedures

The student instructor also has to demonstrate:

- how to advise the student pilot to fly a safe circuit approach
- how to advise the student pilot to perform the landing under different conditions
- how to analyse and correct errors as necessary
- airmanship

EXERCISE 14 - FIRST SOLO AND CONSOLIDATION

OBJECTIVE

To advise the student instructor on how to prepare their students for the first solo flight.

BRIEFING

The student instructor has to explain

- the limitations of the flight (awareness of local area, restrictions)
- the use of required equipment

AIR EXERCISE

The student instructor has to demonstrate

- how to check with another instructor if the student can fly solo
- how to monitor the flight
- how to debrief the flight with the student

EXERCISE 15 - ADVANCED TURNING

OBJECTIVES:

To advise the student instructor on how to teach to fly level, descending and climbing steep turns and how to recognise and avoid stalling or spinning in the turn. **Furthermore the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the forces

- the use of power
- the effect of load factor
- the structural considerations
- the increased stalling speed
- physiological effects
- the rate and radius of turn
- how to perform steep, level, descending and climbing Turns
- stalling in the turn and how to avoid it
- *spinning from the turn – recovery at the incipient stage
- *the spiral dive
- unusual attitudes and recoveries

* Considerations are to be given to manoeuvre limitations and reference to the Flight Manual/Pilot's Operating handbook in relation to mass and balance, and any other restrictions for practice entries to the spin.

AIR EXERCISE

The student instructor has to demonstrate:

- how to perform level, descending and climbing steep turns
- how to avoid stalling in the turn
- the spiral dive and how to recover
- spinning from the turn and how to recover
- recovery from unusual attitudes
- maximum rate turns

The student instructor also has to demonstrate:

- how to advise the student pilot to fly level, descending and climbing steep turns
- how to advise the student pilot to recover from unusual attitudes, stalling and spinning in the turn
- how to analyse and correct errors as necessary
- airmanship

EXERCISE 16 - FORCED LANDING WITHOUT POWER

OBJECTIVES:

To advise the student instructor on how to teach students to select a landing area for a forced landing, to fly the circuit and to master the unusual landing situation. **Furthermore the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the selection of forced landing areas

- the provision for change of plan
- the gliding distance – consideration
- the planning of the descent
- the importance of key positions
- the engine failure checks
- the use of radio – R/T 'distress' procedure
- the circuit
- the go around procedures
- the landing considerations
- the actions after landing – aeroplane security
- the causes of engine failure

AIR EXERCISE

The student instructor has to demonstrate:

- the forced landing procedures
- the selection of landing area
- the provision for change of plan
- the use of the gliding distance considerations
- planning of the descent
- the engine failure checks
- the engine cooling precautions
- the use of radio
- the approach and the landing (if conducted at an aerodrome)
- aeroplane security

The student instructor also has to demonstrate:

- how to advise the student pilot to select a suitable landing area
- how to advise the student pilot to perform a forced landing
- how to analyse and correct errors as necessary
- airmanship

EXERCISE 17 - PRECAUTIONARY LANDING

OBJECTIVES:

To advise the student instructor on how to teach students to select a landing area for a precautionary landing, to fly the circuit and to master the unusual landing situation. **Furthermore the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the occasions when necessary (in flight conditions)
- the landing area selection and communication (R/T Procedure)
- the overhead inspection
- simulated approach
- the climb away
- the landing at a normal aerodrome
- the landing at a disused aerodrome
- the landing on an ordinary field
- circuit and approach
- the actions after landing
- aeroplane security

AIR EXERCISE

The student instructor has to demonstrate:

- how to perform the landing area selection
- the overhead inspection
- the simulated approach
- the climb away
- the landing at a normal aerodrome
- landing at a disused aerodrome (if allowed under national legislation)
- the landing on an ordinary field (break off in a certain altitude)
- the circuit and approach

The student instructor also has to demonstrate:

- how to advise the student pilot to perform the landing area selection
- how to advise the student pilot to perform the simulated approach
- how to analyse and correct errors as necessary
- airmanship

EXERCISE 18A - PILOT NAVIGATION

OBJECTIVES:

To advise the student instructor on how to teach students to plan, prepare and conduct a cross country flight. **Furthermore the student instructor should learn how to identify student errors and how to correct them properly.**

FLIGHT PLANNING

BRIEFING

The student instructor has to explain:

- the weather forecast and actual(s)
- the map selection and preparation

- the choice of route

- the airspace structure

- the calculations **(magnetic heading(s), time(s) en route, fuel consumption, mass and balance)**

- the use of flight information (NOTAM's, radio frequencies, selection of alternate landing sites)

~~- the flight information~~

- how to file a flight plan

Aerodrome Departure

Organisation of Cockpit Workload

DEPARTURE PROCEDURES

BRIEFING

The student instructor has to explain:

- the altimeter settings

- the noting of ETA(s)

EN-ROUTE

BRIEFING

The student instructor has to explain:

- how to read a map – identification of ground

- the maintenance of altitudes and headings

- the revisions to ETA and heading, wind effect, drift angle and groundspeed checks

- the log keeping

- the use of radio (including VDF if applicable)

- the minimum weather conditions for continuance of flight

- the 'in flight' decisions, diversion procedures

- the operations in regulated/controlled airspace

- the procedures for entry, transit and departure

- navigation at minimum level

- the uncertainty of position procedure (Including R/T)

- the lost procedure

ARRIVAL

BRIEFING

The student instructor has to explain:

- the arrival procedures

- the aerodrome circuit joining procedures (controlled aerodromes)

- altimeter setting, ATC liaison, etc.

- how to enter the traffic pattern (uncontrolled aerodromes)

- the circuit procedures
- the parking procedures
- the security of aeroplane refuelling

AIR EXERCISE

The student instructor has to demonstrate:

- how to do the flight planning for a cross country flight
- how to do the additional departure procedures for a cross country flight
- how to organise the cockpit workload
- how to perform the en-route tasks:
  - revision to ETA and heading
  - log keeping
  - decisions on minimum weather conditions for continuance of flight
- other "in flight" decisions
- diversion and uncertainty of position procedures
- the arrival procedures
- the aerodrome joining procedures
- altimeter setting, ATC liaison, etc.
- how to enter the traffic pattern
- the circuit procedures
- the parking procedures

The student instructor also has to demonstrate:

- how to advise the student pilot to plan and prepare a cross country flight
- how to advise the student pilot to perform a cross country flight
- how to analyse and correct errors as necessary
- airmanship

EXERCISE 18B - NAVIGATION AT LOWER LEVELS / REDUCED VISIBILITY

OBJECTIVES:

To advise the student instructor on how to familiarise student pilots with lower level flights or flights with reduced visibility. **Furthermore the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the planning requirements prior to flight in entry/exit lanes
- the ATC rules, pilot qualifications and aircraft equipment
- entry/exit lanes and areas where specific local rules apply

- the low level familiarisation:
    - actions prior to descending
    - visual impressions and height keeping at low altitude
    - effects of speed and inertia during turns
    - effects of wind and turbulence
- the low level operation:
    - weather considerations
    - low cloud and good visibility
    - low cloud and poor visibility
    - avoidance of moderate to heavy rain showers
- the effects of precipitation
- how to join a circuit
- the bad weather circuit, approach and landing

AIR EXERCISE

The student instructor has to demonstrate:

- how to do the low level familiarisation
- how to do the low level operation
- how to perform a bad weather circuit, approach and landing

The student instructor also has to demonstrate:

- how to advise the student pilot to perform a low level operation
- how to advise the student pilot to perform a bad weather circuit, approach and landing
- how to analyse and correct errors as necessary
- airmanship

EXERCISE 18C – RADIO NAVIGATION

OBJECTIVES:

To advise the student instructor on how to demonstrate the use of radio navigation aids to the student pilot. Furthermore the student instructor should learn how to identify student errors and how to correct them properly when using radio navigation systems.

BRIEFING

The student instructor has to explain:

- **the use of the Global Navigation Satellite Systems or VOR/ADF**
    - **the selection of waypoints**
    - **to/from indications, orientation**
    - **error messages**

- the use of VHF direction finding (VHF/DF)

- availability, AIP, frequencies

- R/T procedures and ATC liaison

- obtaining a QDM and homing

- the use of en-route/terminal radar

- availability, AIP

- procedures and ATC liaison

- pilot's responsibilities

- ~~secondarfy~~secondary surveillance radar

- transponders

- code selection

- interrogation and reply

AIR EXERCISE

The student instructor has to demonstrate:

- how to do use the different radio navigation aids

- how to avoid errors

- how to establish contact with ATC

The student instructor also has to demonstrate:

- how to analyse and correct errors as necessary

- how to use radar facilities

- airmanship

EXERCISE 19 – INTRODUCTION TO INSTRUMENT FLYING

OBJECTIVES:

To advise the student instructor on how to fly by reference solely to instruments including the completion of a 180° turn.

BRIEFING

The student instructor has to receive an introduction on the following items:

- flight instruments

- physiological considerations

- instrument appreciation

- attitude instrument Flight

- pitch indications

- bank indications

- introduction to the use of the attitude indicator

- maintenance of heading and balanced flight

- instrument limitations (inc. system failures)

- basic flight manoeuvres

- attitude instrument flight

- cross checking the instruments

- completion of a 180° turn by reference solely to instruments

EXERCISE 20~~19~~ - BASIC NIGHT FLYING (if night instructional qualification required)

OBJECTIVES:

To advise the student instructor on how to teach student pilots to perform a flight at night.

BRIEFING

The student instructor has to give a summary of points to be covered before sending the student on a first solo at night. He should explain the following items:

- the start up procedures
- the local procedures - including ATC liaison
- taxiing
    - parking area and taxiway lighting
    - judgement of speed and distances
    - the use of taxiway lights
    - the avoidance of hazards – obstruction lighting
    - the instrument checks
- holding point – lighting procedure
- the initial familiarisation at night
- the local area orientation
- the significance of lights on other aircraft
- the ground obstruction lights
- the division of piloting effort – external/instrument reference
- the rejoining procedure
- the aerodrome lighting – approach and runway lighting (including VASI and PAPI)
- how to perform night circuits
    - take-off and climb
    - line up
    - visual references during the take-off run
    - transfer to instruments
    - establishing the initial climb
    - use of flight instruments

- instrument climb and initial turn
    - aeroplane positioning – reference to runway lighting
    - the traffic pattern and lookout
    - the initial approach and runway lighting demonstration
    - the aeroplane positioning
    - intercepting the correct approach path
    - the climb away
    - positioning for approach and landing
    - diurnal wind effect
    - the use of landing lights
    - the flare and touchdown
    - the roll out
    - missed approach
- night navigation
- night emergencies
    - radio failure
    - failure of runway lighting
    - failure of aeroplane landing lights
    - failure of aeroplane internal lighting
    - failure of aeroplane navigation lights
    - total electrical failure
    - abandoned take-off
    - engine failure
    - obstructed runway procedure

AIR EXERCISE

The student instructor has to demonstrate:

- how to do plan and to perform a flight at night

The student instructor also has to demonstrate:

- how to advise the student pilot to plan and prepare a flight at night
- how to advise the student pilot to perform a flight at night
- how to analyse and correct errors as necessary
- airmanship

B. ~~Helicopters~~HELICOPTERS

LONG BRIEFINGS AND AIR EXERCISES

~~1 Familiarisation with the helicopter~~

~~2 Preparation before and action after flight~~

~~3 Air experience~~

~~4 Effects of controls~~

~~5 Power and attitude changes~~

~~6 Level flight, climbing and descending and turning~~

~~7 Auto-rotations~~

~~8 Hovering and hover taxiing~~

~~9 Take-off and landing~~

~~10 Transitions from hover to climb and approach to hover~~

~~11 Circuits and emergencies~~

~~12 First solo~~

~~13 Sideways and backwards hover manoeuvring~~

~~14 Spot turns~~

~~15 Hover out of ground effect (OGE) and Vortex ring~~

~~16 Simulated engine off landings~~

~~17 Advanced auto-rotations~~

~~18 Practice forced landings~~

~~19 Steep turns~~

~~20 Transitions~~

~~21 Quick-stops~~

~~22 Navigation~~

~~23 Advanced take-offs, landings and transitions~~

~~24 Sloping ground~~

~~25 Limited power~~

~~26 Confined areas~~

~~27 Night flying (if night instructional qualification required)~~

NOTE: Airmanship should be included as required in each exercise.

EXERCISE 1 - FAMILIARISATION WITH THE HELICOPTER

OBJECTIVE

To advise the student instructor on how to familiarise the student with the helicopter which will be used for the training and to test his position in the aircraft for comfort, visibility, and ability to use all controls and equipment.

BRIEFING AND EXERCISE

The student instructor has to:

- present the type of helicopter which will be used

- explain the cockpit layout – instruments and equipment

- explain the characteristics of the helicopter and the engine systems

- explain and demonstrate the flight controls

- check the position of the student on the seat for comfort, visibility, ability to use all controls

- explain and demonstrate the use of the harness

- explain the differences when occupying the instructor's position

- explain all check lists, drills, controls

- familiarise the student pilot with the helicopter

EMERGENCY DRILLS

The student instructor has to

- explain the action in the event of fire in the air and on the ground (engine/cockpit/ electrical)

- explain systems failures and actions as applicable to type

- explain and demonstrate escape drills

- explain and demonstrate the location and use of emergency equipment and exits

EXERCISE 2 - PREPARATION FOR AND ACTION AFTER FLIGHT

OBJECTIVES

To advise the student instructor on how to explain and demonstrate all the operations to be completed prior to flight and how to explain the actions after flight.

BRIEFING

The student instructor has to explain:

- the manual, tech log (if applicable) and certificate of maintenance

- the equipment required for flight (maps, etc.)

- the external and internal checks

- the harness, seat and rudder pedal adjustment, (student comfort)

- the starting and after starting checks

- the system/power/serviceability checks (as applicable)

- closing down/shutting down the helicopter (including system checks)

- parking, leaving the helicopter (including safety/security as applicable)

- the completion of the helicopter serviceability documents

EXERCISE

The student instructor has to prepare and give a pre-flight briefing:

The student instructor has to demonstrate:

- that the required documents are on board

- that the equipment required for the intended flight is on board

- how to perform a pre-flight external and internal check

- how to verify in-limits mass and balance

- how to adjust harness as well as seat and/or rudder pedals

- the starting, warm up, system and power checks

- how to leave the aircraft

The student instructor also has to demonstrate:

- how to advise the student pilot in performing the pre-flight preparation

- how to advise the student pilot in performing the after flight actions

- how to analyse and correct pre-flight preparation errors of the student as necessary

EXERCISE 3 – AIR EXPERIENCE FLIGHT

OBJECTIVE

To advise the student instructor on how to familiarise the student pilot with being in the air, with the area around the airfield, to note his/her reactions in this situation, and to draw his/her attention to safety and look-out procedures

BRIEFING

The student instructor has to explain:

- the area around the airfield

- the need for looking out

AIR EXERCISE

The student instructor has to:

- demonstrate the cockpit procedures

- show the noteworthy references on the ground

- analyse the reactions of the student

- check that the student looks out (safety)

- demonstrate airmanship

EXERCISE 4 - EFFECTS OF CONTROLS

OBJECTIVES

To advise the student instructor on how to demonstrate the primary and further effects of the flying controls with the help of visual references and how to demonstrate the effects of airspeed, power changes, yaw, disc loading and control friction. The continuous and efficient look-out procedures have to be demonstrated during these exercises.

BRIEFING

The student instructor has to explain:

- the function of the flying controls (primary and secondary effect)

- the effect of airspeed

- the effect of power changes (torque)

- the effect of yaw (sideslip)

- the effect of disc loading (bank and flare)

- the effect on controls of selecting hydraulics on/off

- the effect of control friction

- the instruments

- the use of carburettor heat/anti-icing control

- the look out procedures

AIR EXERCISE

The student instructor has to demonstrate:

- the function of the flying controls

- the effects of airspeed

- the effect of power changes (torque)

- the effect of yaw (sideslip)

- the effect of disc loading (bank and flare)

- the effect on controls of selecting hydraulics on/off

- the effect of control friction

- the instruments (including instrument scan)

- the use of carburettor heat/anti-icing control

- the look-out procedures during all the exercises

The student instructor also has to demonstrate:

- how to advise the student pilot to recognise the primary and further effects of the controls

- how to advise the student to practice the use of flying controls

- how to analyse and correct errors as necessary

- airmanship

EXERCISE 5 - POWER AND ATTITUDE CHANGES

OBJECTIVES

To advise the student instructor on how to explain and demonstrate power and attitude changes. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to explain:

- the relationship between cyclic control position, disc attitude, fuselage attitude, airspeed flapback
- the power required diagram in relation to airspeed
- power and airspeed changes in level flight
- the use of the instruments for precision
- the engine and airspeed limitations

AIR EXERCISE

The student instructor also has to demonstrate:

- the relationship between cyclic control position, disc attitude, fuselage attitude, airspeed flapback
- power and airspeed changes in level flight
- the use of instruments for precision (including instrument scan and lookout)

The student instructor also has to demonstrate:

- how to advise the student pilot to perform power and airspeed changes
- how to advise the student to use the instruments for precision
- how to analyse and correct errors as necessary
- airmanship

EXERCISE 6 - LEVEL FLIGHT, CLIMBING, DESCENDING AND TURNING

NOTE: For ease of training this exercise can be divided into separate parts (see L**A**PL(H) training syllabus) but may be also taught complete or in convenient parts

OBJECTIVES

To advise the student instructor on how to explain and demonstrate level flight, climbing, descending and turning and how to use the instruments for precision. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to explain:

- the basic factors involved in level flight
- the normal power settings
- the use of control friction and/or trim
- the importance of maintaining direction and balance
- the power required/power available diagram
- the optimum climb and descent speeds/angles/rates
- the importance of balance, attitude and co-ordination in the turn
- the effects of turning on rate of climb/descent
- the use of the gyro direction/heading indicator and compass

- the use of instruments for precision

AIR EXERCISE

The student instructor has to demonstrate:

- how to maintain straight and level flight at normal cruise power
- control in pitch, including use of control friction and/or trim
- the use of the ball / yawstring to maintain direction and balance
- setting and use of power for selected airspeeds/speed changes
- the entry to climb
- normal and maximum rate of climb
- levelling off from climb at selected altitudes/heights
- the entry to descent
- the effect of power and airspeed on rate of descent
- levelling off from descent at selected altitudes/heights
- the entry to medium rate turns
- the importance of balance, attitude and co-ordination to maintain level turn
- resuming straight and level flight
- turns onto selected headings, use of direction indicator and compass
- turns whilst climbing and descending
- the effect of turn on rate of climb or descent
- the use of instruments for precision (including instrument scan and lookout)

The student instructor also has to demonstrate:

- how to advise the student pilot to perform level flight and turning
- how to advise the student to perform climbing and descending
- how to analyse and correct errors as necessary
- airmanship

EXERCISE 7 - AUTOROTATION

OBJECTIVES

To advise the student instructor on how to explain and demonstrate an autorotation. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to explain:

- the characteristics of autorotation
- the safety checks (including lookout and verbal warning)
- the entry and development of autorotation

- the effect of AUM, IAS, disc loading, G forces and density altitude on RRPM and rate of descent rotor and engine limitations

- the control of airspeed and RRPM

- the recovery to powered flight

- throttle override and control of ERPM/RRPM during re-engagement (as applicable)

- the danger of vortex condition during recovery

AIR EXERCISE

The student instructor has to demonstrate:

- the safety checks (including verbal warning and lookout)

- the entry to and establishing in autorotation

- the effect of IAS and disc loading on RRPM and rate of descent

- the control of airspeed and RRPM

- the recovery to powered flight

- medium turns in autorotation

- a simulated engine off landing (as appropriate)

The student instructor also has to demonstrate:

- how to advise the student pilot to perform an autorotation

- how to analyse and correct student errors as necessary

- airmanship

EXERCISE 8 - HOVERING AND HOVER TAXIING

OBJECTIVES

To advise the student instructor on how to explain and demonstrate the control and coordination during hover manoeuvres (hovering and hover taxiing). Furthermore, the student instructor should learn how to identify student errors during hovering and how to correct them properly.

BRIEFING

The student instructor has to explain:

- the ground effect and power required

- the effect of wind, attitude and surface

- the stability in hover and effects of over controlling

- the effects of controls in hover

- the control and co-ordination during spot turns

- the requirement for slow hover speed to maintain ground effect

- the effect of hydraulic failure in hover

- specific hazards, e.g. snow, dust, etc.

AIR EXERCISE

The student instructor has to demonstrate:

- the stability in hover and effects of over controlling
- the effects of controls and hover technique
- the gentle forward running touchdown
- control and co-ordination during spot (90 degree clearing) turns
- control and co-ordination during hover taxi
- the dangers of mishandling and overpitching
- (where applicable) the effect of hydraulics failure in hover
- simulated engine failure in the hover and hover taxi

The student instructor also has to demonstrate:

- how to advise the student pilot to perform hovering and hover taxiing
- how to analyse and correct student errors as necessary
- airmanship

EXERCISE 9 - TAKE-OFF AND LANDING

OBJECTIVES

To advise the student instructor on how to explain and demonstrate pre take off checks and drills, look out techniques, the take off and the landing. Furthermore, the student instructor should learn how to identify student errors during take off and landing and how to correct them properly.

BRIEFING

The student instructor has to explain:

- the pre-take-off checks/drills
- the importance of good lookout
- the technique for lifting to hover
- the after take-off checks
- the danger of horizontal movement near ground
- the dangers of mishandling and overpitching
- the technique for landing
- the after landing checks
- the take-off and landing cross wind and downwind

AIR EXERCISE

The student instructor also has to demonstrate:

- how to perform the pre-take-off checks/drills
- the pre-take-off lookout technique
- the lifting to hover
- the after take-off checks

- the landing
- the after landing checks/drills
- the take-off and landing cross wind and downwind

The student instructor also has to demonstrate:

- how to advise the student pilot to perform the checks and drills
- how to advise the student to perform the look out techniques
- how to advise the student to use the different take-off / landing techniques
- how to analyse and correct errors as necessary
- airmanship

EXERCISE 10 - TRANSITIONS FROM HOVER TO CLIMB AND APPROACH TO HOVER

OBJECTIVES

To advise the student instructor on how to explain and demonstrate transitions from hover to climb and from approach to hover. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to explain / revise:

- the ground effect
- the translational lift and its effects
- the inflow roll and its effects
- the flapback and its effects
- the avoid curve diagram and associated dangers
- the effect/dangers of wind speed/direction during transitions
- the transition to climb technique
- the constant angle approach
- the transition to hover technique

AIR EXERCISE

The student instructor has to demonstrate:

- the take-off and landing
- the transition from hover to climb
- the effects of translational lift, inflow roll and flapback
- the constant angle approach
- the technique for transition from descent to hover
- a variable flare simulated engine off landing

The student instructor also has to demonstrate:

- how to advise the student pilot to perform the transition from hover to climb

- how to advise the student pilot to perform the transition from approach to hover

- how to analyse and correct errors as necessary

- airmanship

EXERCISE 11 - CIRCUIT, APPROACH AND LANDING

OBJECTIVES

To advise the student instructor on how to explain and demonstrate the circuit, approach and landing techniques including missed approach procedures and emergency procedures. Furthermore the student instructor should learn how to identify student errors during circuit, approach and landing and how to correct them properly.

BRIEFING

The student instructor has to explain:

- the circuit and associated procedures

- the take-off and climb (including checks/speeds)

- the cross wind leg (including checks/speeds/angles of bank in turns)

- the downwind leg (including pre-landing checks)

- the base leg (including checks/speeds/angles of bank in turns)

- the final approach (including checks/speeds)

- the effect of wind on approach and hover IGE

- the cross wind approach and landing technique

- the missed approach and go around technique (as applicable)

- the steep approach technique (including danger of high sink rate)

- the limited power approach technique (including danger of high speed at touch down)

- the use of the ground effect

- the abandoned take-off technique

- the hydraulic failure drills and hydraulics off landing technique (where applicable)

- the drills/technique for tail rotor control/tail rotor drive failure

- the engine failure drills in the circuit to include

- the engine failures during take-off, circuit and approach

- the noise abatement procedures (as applicable)

AIR EXERCISE

The student instructor has to demonstrate:

- the transitions and constant angle approach

- a basic training circuit, including checks

- a cross wind approach and landing technique
- the missed approach and go around technique (as applicable)
- the steep approach technique
- the basic limited power approach/run on technique
- the use of ground effect
- hydraulic failure and approach to touchdown with hydraulics off
- how to recover at safe height (as applicable)
- the simulated engine failure on take-off, cross wind, downwind, base leg and finals
- variable flare simulated engine off landing

The student instructor also has to demonstrate:

- how to advise the student pilot to perform the circuit, approach and landing
- how to advise the student pilot to conduct a missed approach / go around
- how to advise the student pilot to react in emergency situations
- how to analyse and correct errors as necessary
- airmanship

EXERCISE 12 - FIRST SOLO

OBJECTIVE

To advise the student instructor on how to prepare a students for the first solo flight.

BRIEFING

The student instructor has to explain

- the limitations of the flight (awareness of local area, restrictions)
- the change of attitude due to reduced and laterally displaced weight
- the use of required equipment

AIR EXERCISE

The student instructor has to demonstrate

- how to check with another instructor if the student can fly solo
- how to do the pre flight briefing together with the student pilot
- how to monitor the flight
- how to debrief the flight with the student

EXERCISE 13 - SIDEWAYS AND BACKWARDS HOVER MANOEUVRING

OBJECTIVES

To advise the student instructor on how to explain and demonstrate sideways and backwards hover manoeuvring. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to:

- revise the hovering techniques
- explain the directional stability and weathercocking effect
- explain the danger of pitching nose down on recovery from backwards manoeuvring
- explain the helicopter limitations for sideways and backwards manoeuvring
- explain the effect of C of G position

AIR EXERCISE

The student instructor has to demonstrate:

- hovering and 90 degree clearing turns
- manoeuvring sideways heading into wind
- manoeuvring backwards heading into wind
- manoeuvring sideways and backwards heading out of wind
- manoeuvring backwards too fast and recovery action

The student instructor also has to demonstrate:

- how to advise the student pilot to perform sideways and backwards hover manoeuvring
- how to analyse and correct errors as necessary
- airmanship

EXERCISE 14 - SPOT TURNS

OBJECTIVES

To advise the student instructor on how to explain and demonstrate spot turns. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to explain / revise:

- the ground effect and effect of wind
- weathercocking and control actions
- the control of RRPM
- the torque effect
- the cyclic limiting stops due to C of G position (where applicable)
- the rate of turn limitations
- the spot turn about pilot position
- the spot turn about tail rotor position
- the spot turn about helicopter geometric centre

- square (safe visibility) clearing turn

AIR EXERCISE

The student instructor has to demonstrate:

- weathercocking, torque effect and control actions
- the rate of turn
- the spot turn about pilot position
- the spot turn about tail rotor position
- the spot turn about helicopter geometric centre
- the square, clearing turn

The student instructor also has to demonstrate:

- how to advise the student pilot to perform a spot turn
- how to analyse and correct errors as necessary
- airmanship

EXERCISE 15 - HOVER OUT OF GROUND EFFECT AND VORTEX RING

OBJECTIVES

To advise the student instructor on how to explain and demonstrate hovering out of ground effect and vortex ring. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to revise / explain:

- the ground effect and power required diagram
- the drift/height/power control/lookout/scan
- the vortex ring, (including dangers, recognition and recovery actions)
- the loss of tail rotor effectiveness

AIR EXERCISE

The student instructor has to demonstrate:

- hover OGE
- the drift/height/power control/lookout and instrument scan technique
- the recognition of incipient stage of vortex ring/settling with power
- the recovery action from incipient stage of vortex ring
- the recognition of loss of tail rotor effectiveness and recovery actions

The student instructor also has to demonstrate:

- how to advise the student pilot to perform hovering out of ground effect and vortex ring
- how to analyse and correct errors as necessary
- airmanship

EXERCISE 16 - SIMULATED ENGINE OFF LANDINGS

OBJECTIVES

To advise the student instructor on how to explain and demonstrate a simulated engine off landing.

BRIEFING

The student instructor has to:

- revise the basic autorotation
- revise the effect of AUM, disc loading, density altitude and RRPM decay
- revise the use of cyclic and collective to control speed/RRPM
- explain the torque effect
- explain the use of flare/turn to restore RRPM
- explain the technique for variable flare simulated EOL
- explain the technique for constant attitude simulated EOL
- revise the technique for hover/hover taxi simulated EOL
- explain the emergency technique for engine failure during transition
- explain the technique for low level simulated EOL

AIR EXERCISE

The student instructor has to demonstrate:

- the entry to and control in autorotation
- variable flare simulated EOL
- constant attitude simulated EOL
- hover simulated EOL
- hover taxi simulated EOL
- low level simulated EOL

The student instructor also has to demonstrate:

- how to advise the student pilot to perform a simulated engine off landing
- how to analyse and correct errors as necessary
- airmanship

EXERCISE 17 - ADVANCED AUTOROTATIONS

OBJECTIVES

To advise the student instructor on how to train the student pilot to perform advanced autorotations. Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to:

- explain the effect of airspeed/AUM on angles/rates of descent
- explain the effect of RRPM setting on angle/rate of descent
- explain the reason and technique for range autorotation
- explain the reason and technique for constant attitude autorotation
- explain the reason and technique for low speed and 'S' turns in autorotation
- explain the speed/bank limitations in turns in autorotation
- revise the re-engagement/go-around procedures

AIR EXERCISE

The student instructor has to demonstrate:

- how to select ground marker and standard datum height to determine distance covered during various autorotation techniques
- the basic autorotation
- the technique for range autorotation
- the technique for constant attitude autorotation
- the technique for low speed autorotation, including need for timely speed recovery
- the technique for 'S' turn in autorotation
- 180 and 360 degree turns in autorotation
- re-engagement and go-around technique

The student instructor also has to demonstrate:

- how to advise the student pilot to perform advanced autorotations
- how to analyse and correct errors as necessary
- airmanship

EXERCISE 18 - PRACTICE FORCED LANDINGS

OBJECTIVES

To advise the student instructor on how to explain and demonstrate forced landings. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to explain:

- the types of terrain/surface options for choice of best landing area
- how to practice forced landing procedure
- how to perform forced landing checks and crash actions
- the rules/height for recovery and go-around

AIR EXERCISE

The student instructor also has to demonstrate:

- the recognition of types of terrain from normal cruise height/altitude
- the practicing of forced landing technique
- the recovery/go-around technique

The student instructor also has to demonstrate:

- how to advise the student pilot to perform forced landings
- how to analyse and correct errors as necessary
- airmanship

EXERCISE 19 - STEEP TURNS

OBJECTIVES

To advise the student instructor on how to explain and demonstrate steep turns. Furthermore the student instructor should learn how to identify student errors during steep turns and how to correct them properly.

BRIEFING

The student instructor has to:

- explain the airspeed/angle of bank limitations
- explain the technique for co-ordination to hold bank/attitude
- revise speed/bank limitations in autorotation including RRPM control
- explain the significance of disc loading, vibration and control feedback
- explain the effect of wind in turns at low level

AIR EXERCISE

The student instructor has to demonstrate:

- the technique for turning at 30 degrees of bank
- the technique for turning at 45 degrees of bank (where possible)
- steep autorotative turns
- the effect of wind at low level

The student instructor also has to demonstrate:

- how to advise the student pilot to perform steep turns
- how to analyse and correct faults in the turn (balance, attitude, bank and co-ordination)
- airmanship

EXERCISE 20 - TRANSITIONS

OBJECTIVES

To advise the student instructor on how to explain and demonstrate the techniques for transitions. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to:

- revise the effect of ground cushion, translational lift, flapback

- explain the training requirement for precision exercise

- explain the technique for transition to forward flight and back to hover as precision exercise

- explain the effect of wind

AIR EXERCISE

The student instructor has to demonstrate:

- the transition from hover to minimum 50 knots IAS and back to hover

(Note: select constant height (20 - 30 feet) and maintain)

- the effect of wind

The student instructor also has to demonstrate:

- how to advise the student pilot to perform transitions

- how to analyse and correct faults / errors

- airmanship

EXERCISE 21 - QUICKSTOPS

OBJECTIVES

To advise the student instructor on how to explain and demonstrate quickstops. Furthermore the student instructor should learn how to identify student errors during and how to correct them properly.

BRIEFING

The student instructor has to:

- explain the power control co-ordination

- revise the effect of wind

- explain the technique for quickstop into wind

- explain the technique for quickstop from cross wind

- revise airspeed/angles of bank limitations

- explain the technique for Emergency turn from downwind

- explain the technique for quickstop from downwind from high speed - flare and turn

- explain the technique for quickstop from downwind from low speed - turn and flare

- explain the danger of holding flare when downwind, (vortex ring) - (minimum speed 70 knots)

- revise the danger of high disc loading

AIR EXERCISE

The student instructor has to demonstrate:

- the technique for quickstop into wind

- the technique for quickstop from cross wind

- the danger of vortex ring and disc loading

- the technique for quickstop from downwind with low speed

- the technique for quickstop from downwind with high speed

- emergency turns from downwind

The student instructor also has to demonstrate:

- how to advise the student pilot to perform quickstops

- how to analyse and correct faults / errors

- airmanship

EXERCISE 22 - NAVIGATION

(to be broken down into manageable parts at discretion of instructor)

OBJECTIVES

To advise the student instructor on how to teach students to plan, prepare and conduct a cross country flight. Furthermore the student instructor should learn how to identify student errors during the cross country flight and how to correct them properly.

FLIGHT PLANNING

BRIEFING

The student instructor has to explain:

- the use of weather forecasts/actuals

- the map selection, orientation, preparation and use

- the route choice with particular regard to:

- the airspace structure

- the safety altitudes

- the calculations (magnetic heading(s), time(s) en route, fuel consumption, mass and balance)

- the use of flight information (NOTAM's, radio frequencies, selection of alternate landing sites)

- the helicopter documentation

- the notification of the flight (pre-flight administration procedures, flight plan form)

DEPARTURE

The student instructor has to explain:

- the importance of organisation of cockpit workload

- the departure procedures

- the log keeping

- the use of radio and navaids
- weather monitoring and minimum weather conditions for continuation of flight
- the significance of in flight decision making
- the technique for transiting controlled/regulated airspace
- the uncertainty of position procedure
- the lost procedure

ARRIVAL

The student instructor has to explain:

- the aerodrome joining procedure
- the parking procedures

AIR EXERCISE

The student instructor has to demonstrate:

- how to do the flight planning for a cross country flight
- how to do the additional departure procedures for a cross country flight
- how to organise the cockpit workload
- how to perform the en-route tasks:
    - log keeping
    - decisions on minimum weather conditions for continuance of flight
    - other “in flight” decisions
    - diversion and uncertainty of position / lost procedures
- the arrival procedures
- the aerodrome joining procedures
- the circuit procedures
- the parking procedures

The student instructor also has to demonstrate:

- how to advise the student pilot to plan and prepare a cross country flight
- how to advise the student pilot to perform a cross country flight
- how to analyse and correct errors as necessary
- airmanship

NAVIGATION PROBLEMS AT LOW HEIGHTS AND REDUCED VISIBILITY

The student instructor has to explain:

- the actions prior to descending
- the significance of hazards, (e.g. obstacles, other traffic)
- the difficulties of map reading
- the effects of wind and turbulence
- the significance of avoiding noise sensitive areas

- the procedures for joining a circuit from low level

- the procedures for a bad weather circuit and landing

- appropriate procedures and choice of landing area for precautionary landings

AIR EXERCISE

The student instructor has to demonstrate:

- the navigation procedures as necessary

- the map reading techniques

- how to perform the calculations

- how to perform the revision of headings and ETA's

- appropriate procedures and choice of landing area for precautionary landings

Furthermore the student instructor has to demonstrate:

- how to advise the student pilot to solve navigation problems at low heights/reduced visibility

- how to analyse and correct student errors

EXERCISE 23 - ADVANCED TAKE-OFF, LANDINGS, TRANSITIONS

OBJECTIVES

To advise the student instructor on how to teach students to perform advanced take-offs, landings and transitions. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to:

- revise the landing and takeoff out of wind (performance reduction)

- revise the wind limitations

- revise the directional stability variation when out of wind

- revise the power required diagram

- explain the technique for downwind transitions

- explain the technique for vertical take-off over obstacles

- explain the reconnaissance technique for landing site

- explain the power checks

- explain the technique for running landing

- explain the technique for zero speed landing

- explain the technique for cross wind and downwind landings

- explain the steep approach, including dangers

- revise the go around procedures

AIR EXERCISE

The student instructor has to demonstrate:

- how to perform the technique for downwind transition
- how to perform the technique for vertical take-off over obstacles
- how to perform the reconnaissance technique for landing site
- how to do the power check and assessment
- how to perform the technique for running landing
- how to perform the technique for zero speed landing
- how to perform the technique for cross wind and downwind landings
- how to perform the technique for steep approach
- go around procedures

The student instructor also has to demonstrate:

- how to teach the student pilot to perform advanced take-offs, landings and/or transitions
- how to analyse and student correct errors as necessary

EXERCISE 24 - SLOPING GROUND

OBJECTIVES

To advise the student instructor on how to explain and demonstrate the different techniques for take-offs and/or landings skid up and/or nose up slope. Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to explain:

- the limitations
- the wind and slope relationship, including blade and control stops
- the effect of C of G when on slope
- the ground effect and power required when on slope
- the landing technique when on slope, left, right and nose-up
- the avoidance of dynamic rollover, dangers of soft ground and sideways movement
- the dangers of overcontrolling near ground on slope
- the danger of striking main/tail rotor on up slope

AIR EXERCISE

The student instructor has to demonstrate:

- the technique for assessing slope angle
- the technique for landing/take-off left skid up slope
- the technique for landing/take-off right skid up slope
- the technique for landing nose up slope

- the dangers of over controlling near ground

The student instructor also has to demonstrate:

- how to advise the student pilot to perform nose up or skid up slope take-offs/landings
- how to analyse and correct faults / errors
- airmanship

EXERCISE 25 - LIMITED POWER

OBJECTIVES

To advise the student instructor on how to explain and demonstrate limited power exercises. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to explain:

- the use of appropriate helicopter performance graphs
- the selection of technique according to available power
- the effect of wind on available power

AIR EXERCISE

The student instructor has to revise and refine the techniques demonstrated in exercise 23.

EXERCISE 26 - CONFINED AREAS

OBJECTIVES

To advise the student instructor on how to teach students the approach, landing and take-off procedures for confined areas. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to revise / explain:

- the use of helicopter performance graphs
- the procedure for locating landing site and selecting site marker
- the procedures for assessing wind speed/direction
- the landing site reconnaissance techniques
- the reason for selecting landing markers
- the procedure for selecting direction and type of approach
- the dangers of out of wind approach
- the circuit procedures
- the reason for approach to committal point and go around, (practice approach)
- the approach technique

- the clearing turn and landing, (sloping ground technique)
- the hover power check/performance assessment IGE and OGE, (if necessary)
- the take-off procedures

AIR EXERCISE

The student instructor has to demonstrate:

- the procedure for locating landing site and selecting site marker
- the procedure for assessing wind speed/direction
- the landing site reconnaissance techniques
- how to select landing markers, direction and type of approach
- the circuit procedure
- how to practice the approach, go around and approach technique
- the clearing turn and landing, (sloping ground technique)
- the hover power check/performance assessment IGE and OGE, (if necessary)
- the take-off procedures

The student instructor also has to demonstrate:

- how to advise the student pilot to perform the techniques for confined areas
- how to analyse and correct faults / errors
- airmanship

~~EXERCISE 27 – NIGHT FLYING (if night instructional qualification required)~~

~~OBJECTIVES~~

~~To advise the student instructor on how to teach student pilots to perform a flight at night.~~

~~BRIEFING~~

~~The student instructor has to explain:~~

- ~~the medical/physiological aspects of night vision~~
- ~~the requirement for torch to be carried, (pre-flight inspection, etc.)~~
- ~~the use of the landing light~~
- ~~the take-off and hover taxi procedures at night~~
- ~~the night take-off procedure~~
- ~~the cockpit procedures at night~~
- ~~the approach techniques~~
- ~~the night landing techniques~~
- ~~the night autorotation techniques (power recovery at safe height)~~

~~- the technique for practice forced landing at night (using appropriate illumination)~~

~~- the emergency procedures at night~~

~~- the navigation principles at night~~

~~- the map marking for night use, (highlighting built up/lit areas with thicker lines, etc.)~~

~~AIR EXERCISE~~

~~The student instructor has to demonstrate:~~

~~- the use of torch for pre-flight inspection~~

~~- the use of the landing light~~

~~- a night take-off to hover, (no sideways or backwards movement)~~

~~- a night hover taxi, (higher and slower than by day)~~

~~- a night transition procedure~~

~~- a night circuit~~

~~- a night approach and landing, (including use of landing light)~~

~~- a night autorotation (power recovery at safe height)~~

~~- how to perform a forced landing at night, (using appropriate illumination)~~

~~- night emergency procedures~~

~~- night cross country techniques, as appropriate~~

~~The student instructor also has to demonstrate:~~

~~- how to advise the student pilot to perform a flight at night~~

~~- how to analyse and correct errors as necessary~~

C. ~~Sailplanes~~SAILPLANES

LONG BRIEFINGS AND AIR EXERCISES

~~1 Familiarisation with the sailplane~~

~~2 Procedures in the event of emergencies~~

~~3 Preparation for flight~~

~~4 Initial air experience~~

~~5 Effects of controls~~

~~6 **Co-ordinated**Moderate Banki **rolling to and from moderate angles of bank**ng - coordination~~

~~7 Straight flying~~

~~8 Turning~~

~~9 Slow flight **and stalling**~~

~~10 Stalling~~

~~11A Spin recognition**, spin** and avoidance **and developed spins (entry and recovery)**~~

~~11B Developed spins – entry and recovery~~

~~12 Take-off / Launch methods~~

~~1**1A**2A Winch launch~~

~~1**1B**2B Aero tow~~

~~12**1**C Self-launch~~

~~1**1**2D Car launch~~

~~1**2**3 **Circuit, approach and landing** Soaring Techniques~~

~~13A **First Solo**~~

~~**14 Advanced turning**~~

~~**15 Soaring Techniques**~~

~~**15A** Thermalling **(if applicable during training and if possible at training site)**~~

~~1**5**3B Ridge flying (if applicable during training and if possible at training site)~~

~~1**5**3C Wave flying (if applicable during training and if possible at training site)~~

~~14 Circuit, approach and landing~~

~~15 First solo~~

~~16 Advanced turning~~

~~17**6** Out-landings~~

~~1**7**8 Cross country flying~~

~~1**7**8A Flight Planning~~

~~1**7**8B In-Flight Navigation~~

~~1**7**8C Cross country soaring techniques~~

NOTE: Although **the fully developed spin in** exercise 1**0**~~1B~~ is not required for the L**A**PL course, it is a requirement for the LAFI course.

EXERCISE 1 - FAMILIARISATION WITH THE SAILPLANE

OBJECTIVE

To advise the student instructor on how to familiarise the student with the sailplane which will be used for the training and to test his position in the sailplane for comfort, visibility, and ability to use all controls and equipment.

BRIEFING AND EXERCISE

The student instructor has to:

- present the type of sailplane which will be used
- explain the cockpit layout – instruments and equipment

- explain the flight controls - stick, pedals, airbrakes, flaps, cable release, undercarriage
- check the position of the student on the seat for comfort, visibility, ability to use all controls
- explain the use of the harness
- demonstrate how to adjust the rudder pedal
- explain the differences when occupying the instructor's position
- explain all check lists, drills, controls

EXERCISE 2 - PROCEDURE IN THE EVENT OF EMERGENCIES

OBJECTIVE

To advise the student instructor on how to familiarise the student with the use of the parachute and how to explain the bail out procedure in case of emergency**.**

BRIEFING

The student instructor has to:

- explain how to handle the parachute with care (transport, storage, drying after use)
- demonstrate the adjustment of the parachute harness
- explain the bail out procedure (especially from a sailplane in unusual attitude)
- explain the procedure for landing with a parachute in normal conditions and with a strong wind

EXERCISE 3 - PREPARATION FOR FLIGHT

OBJECTIVE:

To advise the student instructor on how to explain all the operations to be completed prior to flight**. Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the need for a pre-flight briefing
- the structure and the content of this briefing
- which documents are required on board
- which equipment are required for a flight
- how to handle the sailplane on the ground / how to move it/ how to tow it out, how to park it
- how to do the pre-flight external and internal checks
- the procedure for verifying in-limits mass and balance
- the pre-launch checks (check list)

PRACTICAL EXERCISE

The student instructor has to prepare and give a pre-flight briefing:

The student instructor has to demonstrate:

- that the required documents are on board
- that the equipment required for the intended flight is on board
- how to handle the sailplane on the ground / move it to the start position / tow it out, park it
- how to perform a pre-flight external and internal check
- how to verify in-limits mass and balance
- how to adjust harness as well as seat and/or rudder pedals
- the pre-launch checks

The student instructor also has to demonstrate:

- how to advise the student pilot in performing the pre-flight preparation
- how to analyse and correct pre-flight preparation errors as necessary

EXERCISE 4 - INITIAL AIR EXPERIENCE

OBJECTIVE

To advise the student instructor on how to familiarise the student with being in the air, with the area around the airfield, to note his/her reactions in this situation, and to draw his/her attention to safety and look-out procedures**.**

BRIEFING

The student instructor has to explain:

- the area around the airfield
- the need for looking out
- **the change of aircraft control**

AIR EXERCISE

The student instructor has to:

- show the noteworthy references on the ground
- analyse the reactions of the student
- check that the student looks out (safety)
- demonstrate airmanship

EXERCISE 5 - PRIMARY EFECTS OF CONTROLS

OBJECTIVE

To advise the student instructor on how to:

- demonstrate the primary effects of each control with the help of visual references
- train the student pilot to recognise when the sailplane is no longer in a normal attitude along one of the axes and to return to the normal attitude

- train continuous and efficient look-out during these exercises

- analyse and correct errors and student pilot mistakes as necessary

BRIEFING

The student instructor has to define the axes of a sailplane

The student instructor has to explain:

- the look-out procedures
- the visual references along each axis
- the primary effects of controls when laterally level
- the relationship between attitude and speed
- the use of flaps
- the use of airbrakes

AIR EXERCISE

The student instructor has to demonstrate:

the visual references in flight

- the primary effect of the elevator
- the relationship between attitude and speed (inertia)
- the primary effect of rudder on the rotation of the sailplane around the vertical axis
- the primary effect of ailerons on banking
- the effect of airbrakes (including changes in pitch when airbrakes are extended or retracted)
- the effects of flaps (provided the sailplane has flaps)
- the look-out procedures during all the exercises
- airmanship

The student instructor also has to demonstrate:

- how to advise the student pilot to recognise the primary effects of each control
- how to analyse and correct errors as necessary

EXERCISE 6 –– CO-ORDINATED ROLLING TO AND FROM MODERATE ANGLES OF BANK ~~BANKING AT MODERATE ANGLE - COORDINATION~~

OBJECTIVE

To advise the student instructor on secondary effects of controls and on how to teach the student to coordinate ailerons and ru**d**der in order to compensate for the adverse yaw effect. **Furthermore the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the secondary effects of controls
- the adverse yaw effect

- how to compensate for the adverse yaw

- the further effect of the rudder (roll)

AIR EXERCISE

The student instructor has to demonstrate

- the adverse yaw effect with a reference on ground

- the further effect of the rudder (roll)

- the coordination of ruder and aileron controls to compensate for the adverse yaw effects

- **rolling to and from moderate angles of bank**~~moderate banking~~ (20 to 30 °) and return**ing** ~~-~~to the **straight**~~level~~ flight

The student instructor also has to demonstrate:

- how to advise the student pilot to coordinate ailerons and rudder

- how to analyse and correct errors as necessary

EXERCISE 7 - STRAIGHT FLYING

OBJECTIVE

To advise the student instructor on how to train the student to maintain straight ~~and level~~ flight with a constant heading without slipping and skidding. **Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to:

-explain how to maintain straight flight

-explain **different** airspeed limitations ~~(Vne)~~

-explain the pitch stability of the sailplane

-explain the effect of trimming

AIR EXERCISE

The instructor student has to demonstrate:

- maintaining straight flight

- inherent pitch stability

- the control of the sailplane in pitch, including use of trim with visual references and airspeed

- how to perform the instrument monitoring

- the control of level attitude with visual references

- the control of the heading with a visual reference on the ground

- the look-out procedures during all the exercises

The student instructor also has to demonstrate:

- how to advise the student pilot to maintain straight ~~and level~~ flight

- how to analyse and correct errors as necessary

- airmanship

EXERCISE 8 - TURNING

OBJECTIVE

To advise the student instructor on how to teach students to fly turns and circles with a moderate constant bank of about 30 ° with constant attitude (speed) and coordinated flight. **Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the forces on the sailplane during a turn

- the need to look out before turning

- the sequences of a turn (entry, stabilizing, exiting)

- the common faults during a turn

- how to turn on to selected headings, use of compass

- the use of instruments (ball indicator and/or slip string) for precision

AIR EXERCISE

The student instructor has to demonstrate:

- the look-out procedure before turning

- entering a turn (correction of adverse yaw)

- the stabilisation of a turn (keeping the attitude and compensating the induced roll)

- the exit from a turn

- the most common faults in a turn

- turns on to selected headings (use landmarks as reference)

- use of instruments (ball indicator and/or slip string) for precision

The student instructor also has to demonstrate:

- how to advise the student pilot to fly a turn / circle with a moderate bank

- how to analyse and correct errors as necessary

EXERCISE 9A - SLOW FLIGHT

OBJECTIVE

To advise the student instructor on how to improve the student's ability to recognise inadvertent flight at critically low speeds (high angle of attack) and to provide practice in maintaining the sailplane in balance while returning to normal attitude (speed). **Furthermore the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain

- the characteristics of slow flight

- the risks of stalling

AIR EXERCISE

The student instructor has to:

- Check that the airspace below the sailplane is free of other aircraft before starting the exercise

The student instructor has to demonstrate:

- a controlled flight down to critically high angle of attack (slow airspeed), and draw the attention

—of the student to the nose up attitude, reduction of noise, reduction of speed

- a return to the normal attitude (speed)

- airmanship

The student instructor also has to demonstrate:

- how to advise the student pilot to recognise inadvertent flight at critically low speeds

- how to provide practice in maintaining the sailplane in balance while returning to normal attitude

- how to analyse and correct errors as necessary

EXERCISE 9B~~10~~ - STALLING

OBJECTIVE

To advise the student Instructor on how to improve the student's ability to recognize a stall and to recover from it. This includes stall from a level flight and stalls when a wing drops. **Furthermore the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain

- the mechanism of a stall

- the effectiveness of the controls at the Stall

- pre-stall symptoms, recognition and recovery

- factors affecting the stall (importance of the angle of attack, high speed stall)

- effect of flaps if any on the sailplane

- the effects of unbalance at the stall safety checks

- stall symptoms, recognition and recovery

- recovery when a wing drops

- approach to stall in the approach and in the landing configurations - recognition and recovery from accelerated stalls

AIR EXERCISE

The student instructor has to check that the airspace below the sailplane is free of other aircraft/traffic before starting the exercise The student instructor should demonstrate:

- stall from a level flight
- pre-stall symptoms, recognition and recovery
- stall symptoms, recognition and recovery
- recovery when a wing drops
- approach to stall in the approach and in the landing configurations
- recognition and recovery from accelerated stalls
- stalling and recovery at the incipient stage with 'instructor induced' distractions

The student instructor also has to demonstrate:

- how to improve the student pilot's ability to recognise a stall and to recover from it
- how to analyse and correct errors as necessary
- airmanship

NOTE: Consideration is to be given to manoeuvre limitations and references to The Owners'/Flight manual or Pilot's Operating Handbook in relation to Mass and Balance limitations. These factors are also covered in the next exercise.

EXERCISE 10A~~1A~~ - SPIN RECOGNITION AND AVOIDANCE

OBJECTIVES

To advise the student Instructor on how to improve the student's ability to recognize a spin at the incipient stage and to recover from it. **Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain

- why a sailplane spins
- how to recognise the symptoms of a spin (not to be confused with spiral dive)
- what are the parameters influencing the spin
- how to recover from a spin

AIR EXERCISE

The student instructor has to check that the airspace below the sailplane is free of other aircraft/traffic before starting the exercise

The student instructor has to demonstrate:

- stalling and recovery at the incipient spin stage (stall with excessive wing drop, about 45°)
- airmanship

The student instructor also has to:

- make sure that the student recognises the spin entry
- make sure that the student pilot is able to recover from the spin
- check if the student still reacts properly if the instructor induces distractions during the spin entry
- demonstrate how to analyse and correct errors as necessary

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

EXERCISE 10~~1~~B - DEVELOPED SPINS – ENTRY AND RECOVERY

OBJECTIVES:

To advise the student instructor on how to recognize a developed spin and to recover from it**. Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain**:**

- the spin entry
- the symptoms of a real spin and the recognition and identification of Spin Direction
- the spin recovery
- use of controls
- effects of flaps (flap restriction applicable to type)
- the effect of the C of G upon spinning characteristics
- the spinning from various flight attitudes
- the sailplane limitations
- airmanship – safety checks
- common errors during recovery

AIR EXERCISE

The student instructor has **to** check that the airspace below the sailplane is free of other aircraft/traffic before starting the exercise**.**

The student instructor has to demonstrate:

- safety checks
- the spin entry
- the recognition & identification of the spin direction
- the spin recovery (reference to Flight Manual)
- the use of controls
- the effects of flaps (restrictions applicable to aeroplane type)
- spinning and recovery from various flight attitudes
- airmanship

The student instructor also has to demonstrate:

- how to improve the student pilot’s ability to recognise a spin and how to recover from it

- how to analyse and correct errors as necessary

EXERCISE 11~~2~~ - TAKE OFF/ LAUNCH METHODS

NOTE: the student instructor has to teach at least one of the following launch methods: winch launch, aero tow, self launch. **At least three launch failure exercises should be completed. Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.**

EXERCISE 11~~2~~A

WINCH LAUNCH

OBJECTIVES

To advise the student instructor on how to teach winch launches and on how to make sure that their student will manage an aborted launch. **Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the signals and /or communication before and during launch

- the use of the launching equipment

- the pre-take-off checks

- the procedure for into wind take-off

- the procedure for crosswind take-off

- the optimum profile of winch launch and limitations

- the launch failure procedures

AIR EXERCISE

The student instructor has to demonstrate:

- the use of the launching equipment

- the pre-take-off checks

- the into wind take-off

- the crosswind take-off

- the optimum profile of winch launch and limitations

- the procedure in case of cable break or aborted launch, launch failure procedures

- airmanship

The student instructor also has to demonstrate:

- how to teach the student pilot to perform safe winch launches

- how to teach the student pilot to manage an aborted launch (different altitudes)

- how to analyse and correct errors as necessary

EXERCISE 11~~2~~B - AERO TOW

OBJECTIVES

To advise the student instructor on how to teach aero towing and on how to make sure that their student will manage an aborted launch. **Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the signals and/or communication before and during launch
- the use of the launch equipment
- the pre-take-off checks
- the procedure for into wind take-off
- the procedure for crosswind take-off
- the procedure on tow – straight flight / turning / slip stream
- the recovery from out-of-position on tow
- the procedures in case of launch failure and abandonment
- the descending procedure on tow (towing aircraft and sailplane)
- **the reasons for launch failures and abandonment / procedures**

AIR EXERCISE

The student instructor has to demonstrate:

- the signals before and during launch
- the use of the launch equipment
- the pre-take-off checks
- the procedure for into wind take-off
- the procedure for a crosswind take-off
- the procedures on tow – straight flight / turning / slip stream
- the recovery from out-of-position on tow
- the procedure in case of launch failure and abandonment
- the descending procedure on tow
- airmanship

The student instructor also has to demonstrate:

- how to teach the student pilot to perform safe aero tow launches
- how to teach the student pilot to manage an aborted launch
- how to analyse and correct errors as necessary

BRIEFING EXERCISE 11~~2~~C - SELF LAUNCH

OBJECTIVES

To advise the student instructor on how to teach launching with a self launching sailplane and on how to make sure that their student will manage an aborted launch. **Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the engine extending and retraction procedures
- the engine starting and safety precautions
- the pre-take-off checks
- the noise abatement procedures
- the checks during and after take-off
- the into wind take-off
- the crosswind take-off
- the procedure in case of power failure
- the procedure in case of abandoned take-off
- the maximum performance (short field and obstacle clearance) take-off
- the short take-off and soft field procedure / techniques and performance calculations

AIR EXERCISE

The student instructor has to demonstrate:

- the engine extending and retraction procedures
- the engine starting and safety precautions
- the pre-take-off checks
- the noise abatement procedures
- the checks during and after take off
- the into wind take-off
- the crosswind take-off
- the power failures / procedures
- the procedure in case of abandoned take-off
- the maximum performance (short field and obstacle clearance) take-off
- the short take-off and soft field procedure / techniques and performance calculations
- airmanship

The student instructor also has to demonstrate:

- how to teach the student pilot to perform safe self launches

- how to teach the student pilot to manage an aborted launch (different altitudes)

- how to analyse and correct errors as necessary

EXERCISE 12 - CIRCUIT APPROACH AND LANDING

OBJECTIVES

To advise the student instructor on how to teach their students to fly a safe circuit approach and to land the sailplane. Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to explain:

- the procedures for rejoining the circuit

- the procedures for collision avoidance and the look -out techniques

- the pre-landing check

- the normal circuit procedures, downwind, base leg

- the effect of wind on approach and touchdown speeds

- the visualisation of a reference point

- the approach control and use of airbrakes

- the use of flaps (if applicable)

- the procedures for normal and crosswind approach and landing

AIR EXERCISE

The student instructor has to demonstrate:

- the procedures for rejoining the circuit

- the procedures for collision avoidance and the look- out techniques

- the pre-landing check

- the standard circuit and contingency planning (e.g. running out of height)

- the effect of wind on approach and touchdown speeds

- the visualisation of an aiming point

- the approach control and use of airbrakes

- the use of flaps (if applicable)

- the procedures for normal and crosswind approaches and landings

- airmanship

The student instructor also has to demonstrate:

- how to teach the student pilot to fly a safe circuit approach

- how to improve the student pilot's ability to perform a safe landing

- how to analyse and correct errors as necessary

EXERCISE 13 - FIRST SOLO

OBJECTIVE

To advise the student instructor on how to prepare their students for the first solo flight.

BRIEFING

The student instructor has to explain

- the limitations of the flight (awareness of local area, restrictions)

- the use of required equipment

AIR EXERCISE

The student instructor has to

- check with another/more senior instructor if the student can fly solo

- monitor the flight

- debrief the flight with the student

EXERCISE 14 - ADVANCED TURNING

OBJECTIVES

To advise the student instructor on how to fly steep turns or circles (45° banking) at constant attitude (speed) and with the yaw string centred. Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to explain

- the relationship between banking and speed

- how to master steep turns or circles

- the unusual attitudes which can occur (stalling/spinning, spiral dive)

- how to recover from these unusual attitudes

AIR EXERCISE

The student has to demonstrate:

- steep turns (45°) at constant speed and with the yaw string centred

- common errors (slipping, skidding)

- unusual attitudes and how to recover from them

- airmanship

The student instructor also has to demonstrate:

- how to teach the student pilot to fly steep turns or circles

- how to analyse and correct errors as necessary

EXERCISE 15~~3~~ - SOARING TECHNIQUES

NOTE: If the weather conditions during the instructor training do not allow the practical training of soaring techniques, all items of the air exercises have to be discussed and explained during a long briefing exercise only.

EXERCISE 15~~3~~A - THERMALLING

OBJECTIVES

To advise the student instructor on how to teach their students to recognise and detect thermals, on how to join a thermal and on how to look out, in order to avoid mid-air collisions. **Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain

- the look-out procedures
- the detection and recognition of thermals
- the use of audio soaring instruments
- the procedure for joining a thermal and giving way
- how to fly in close proximity to other sailplanes
- how to centre in thermals
- how to leave thermals

AIR EXERCISE

The student instructor has to demonstrate

- the look-out procedures
- the detection and recognition of thermals
- the use of audio soaring instruments
- the procedure for joining a thermal and giving way
- the procedure for flying in close proximity to other sailplanes
- the centering in thermals
- the procedure for leaving thermals
- airmanship

The student instructor also has to demonstrate:

- how to improve the student pilot’s ability to recognise and detect thermals
- how to improve the student pilot’s ability to join a thermal and how to look out
- how to analyse and correct errors as necessary

EXERCISE 15~~3~~B - RIDGE FLYING

OBJECTIVE

To advise the student instructor on how to teach their students to fly safely on ridges, to control their speed, and to apply the rules in order to avoid mid-air collisions. **Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the look-out procedures
- the ridge flying rules
- the recognition of optimum flight path
- speed control

AIR EXERCISE (if applicable during training and, if possible, at training site)

The student instructor has to demonstrate:

- the look-out procedures
- the practical application of ridge flying rules
- the recognition of optimum flight path
- speed control
- airmanship

The student instructor also has to demonstrate:

- how to teach the student pilot to fly safely on ridges
- how to analyse and correct errors as necessary

EXERCISE 15~~3~~C - WAVE FLYING

OBJECTIVES

To advise the student instructor on how to introduce students to wave flying and to teach them to fly safely at high altitude. **Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the look-out procedures
- the techniques to be used to accede to a wave
- the speed limitations with increasing height
- the risks of hypoxia and the use of oxygen

AIR EXERCISE (if applicable during training and if possible at training site)

The student instructor has to demonstrate:

- the look-out procedures
- the wave access techniques
- the speed limitations with increasing height
- the use of oxygen (if available)

- airmanship

The student instructor also has to demonstrate:

- how to improve the student pilot's ability to recognise and detect waves
- how to teach the student pilot to fly safely in a wave
- how to analyse and correct errors as necessary

~~EXERCISE 14 – CIRCUIT APPROACH AND LANDING~~

~~OBJECTIVES~~

~~To advise the student instructor on how to teach their students to fly a safe circuit approach and to land the sailplane~~

~~BRIEFING~~

~~The student instructor has to explain:~~

~~- the procedures for rejoining the circuit~~

~~- the procedures for collision avoidance and the look -out techniques~~

~~- the normal circuit procedures, downwind, base leg~~

~~- the effect of wind on approach and touchdown speeds~~

~~- the visualisation of a reference point~~

~~- the approach control and use of airbrakes~~

~~- the use of flaps (if applicable)~~

~~- the procedures for normal and crosswind approach and landing~~

~~AIR EXERCISE~~

~~The student instructor has to demonstrate:~~

~~- the procedures for rejoining the circuit~~

~~- the procedures for collision avoidance and the look- out techniques~~

~~- the standard circuit and contingency planning (e.g. running out of height)~~

~~- the effect of wind on approach and touchdown speeds~~

~~- the visualisation of an aiming point~~

~~- the approach control and use of airbrakes~~

~~- the use of flaps (if applicable)~~

~~- the procedures for normal and crosswind approaches and landings~~

~~- airmanship~~

~~The student instructor also has to demonstrate:~~

~~- how to teach the student pilot to fly a safe circuit approach~~

~~- how to improve the student pilot's ability to perform a safe landing~~

~~- how to analyse and correct errors as necessary~~

~~EXERCISE 15 – FIRST SOLO~~

~~OBJECTIVE~~

~~To advise the student instructor on how to prepare their students for the first solo flight.~~

~~BRIEFING~~

~~The student instructor has to explain~~

~~- the limitations of the flight (awareness of local area, restrictions)~~

~~- the use of required equipment~~

~~AIR EXERCISE~~

~~The student instructor has to~~

~~- check with another/more senior instructor if the student can fly solo~~

~~- monitor the flight~~

~~- debrief the flight with the student~~

~~EXERCISE 16 - ADVANCED TURNING~~

~~OBJECTIVES~~

~~To advise the student instructor on how to fly steep turns or circles (30-40° banking) at constant attitude (speed) and with the yaw string centred.~~

~~BRIEFING~~

~~The student instructor has to explain~~

~~- the relationship between banking and speed~~

~~- how to master steep turns or circles~~

~~- the unusual attitudes which can occur (stalling/spinning, spiral dive)~~

~~- how to recover from these unusual attitudes~~

~~AIR EXERCISE~~

~~The student has to demonstrate:~~

~~- steep turns (45°) at constant speed and with the yaw string centred~~

~~- common errors (slipping, skidding)~~

~~- unusual attitudes and how to recover from them~~

~~- airmanship~~

~~The student instructor also has to demonstrate:~~

~~- how to teach the student pilot to fly steep turns or circles~~

~~- how to analyse and correct errors as necessary~~

EXERCISE 1~~7~~6 - OUT-LANDINGS

NOTE: If the weather conditions during the instructor training do not allow the practical training of outlanding procedures (a touring motor glider may be used) all items of the air exercise have to be discussed and explained during a long briefing exercise only. **Instructors may only teach the safe outlanding exercise after they have demonstrated the practical ability to do so.**

OBJECTIVE

To advise the student instructor on how to teach students to select an out-landing field, to fly the circuit and how to master the unusual landing situation. **Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain

- the gliding range at max L/D
- the engine re-start procedures (only for self-launching and self-sustaining sailplanes)
- the selection of a landing area
- the circuit judgement and key positions
- the circuit and approach procedures
- the actions to be done after landing

AIR EXERCISE

The student instructor has to demonstrate:

- precision landings on the airfield
- the gliding range
- the procedures for joining, arrival and circuit at a remote aerodrome
- the selection of an out-landing area
- the procedures for circuit and approach on an out-landing field, procedures
- the actions to be done after landing
- airmanship

The student instructor also has to be trained:

- how to advise the student pilot to do perform a safe outlanding
- how to master an unusual landing situation
- how to analyse and correct errors as necessary

EXERCISE 187 - CROSS COUNTRY FLYING

NOTE: If the weather conditions during the instructor training do not allow a cross country training flight the items of the air exercise have to be discussed and explained during a long briefing exercise only.

EXERCISE 178A - FLIGHT PLANNING

OBJECTIVES

To advise the student instructor on how plan and prepare a cross-country flight

BRIEFING

The student instructor has to explain

- the weather forecast and current situation

- the selection of the amount of water to be carried as a function of the weather forecast

- the method for selecting a task, taking into account the average speed to be expected

- the map selection and preparation

- the NOTAMS, airspace considerations

- the radio frequencies (if applicable)

- the pre-flight administrative procedures

- the procedure for filing a flight plan where required

- alternate aerodromes and landing areas

EXERCISE 17~~8~~B - IN-FLIGHT NAVIGATION

OBJECTIVES

To advise the student instructor on how to teach performing a cross-country flight**.**

BRIEFING

The student instructor has to explain

- how to maintain track and re-route if necessary

- the altimeter settings

- the use of radio and phraseology

- the in-flight planning

- the procedures for transiting regulated airspace / ATC liaison where required

- the procedure in case of uncertainty of position

- the procedure in case of becoming lost

AIR EXERCISE

The student instructor has to demonstrate:

- maintaining track and re-routing if necessary

- altimeter settings

- the use of radio and phraseology

- in-flight planning

- procedures for transiting regulated airspace / ATC liaison where required

- uncertainty of position procedure

- lost procedure

- use of additional equipment where required

- joining, arrival and circuit procedures at remote aerodrome

- airmanship

The student instructor also has to demonstrate:

- how to teach the student pilot to perform a cross-country flight

- how to analyse and correct errors as necessary

EXERCISE 17~~8~~C - CROSS-COUNTRY SOARING TECHNIQUES

OBJECTIVES

To advise the student instructor on the techniques for an efficient cross country flight**.**

BRIEFING

The student has to explain

- the speed to fly at maximal L/D ratio
- the speed to fly to maximise the cruise speed (Mc Cready theory)
- how to select the optimal track (efficient use of cloud streets etc)
- how to calculate the final glide
- how to perform a safe outlanding

AIR EXERCISE

The student has to demonstrate:

- a cross-country flight
- the selection of the optimal track (efficient use of cloud streets, etc)
- the use of the MacCready ring
- use of final glide computers
- how to reduce risk and to react to potential dangers
- how to plan and perform an outlanding
- airmanship

The student instructor also has to demonstrate:

- how to teach the student pilot techniques for an efficient cross country flight
- how to analyse and correct errors as necessary

D. ~~Balloons~~BALLOONS

LONG BRIEFINGS AND AIR EXERCISES

~~1 Familiarisation with the balloon~~

~~2 Preparation for flight~~

~~3 Crew and Passenger Briefing~~

~~4 Assembly and layout~~

~~5 Inflation~~

~~6 Take off in different wind conditions~~

~~7 Climb to level flight~~

~~8 Level flight~~

~~9 Descent to level flight~~

~~10 Emergencies~~

~~11 Navigation~~

~~12A Fuel Management hot air balloons~~

~~12B Ballast Management gas balloons~~

~~13 Approach from low level~~

~~14 Approach from high level~~

~~15 Operating at low level~~

~~16 Landing in different wind conditions~~

~~17 **First Solo** Tethered flight hot air balloons~~

~~18 **Tethered flights hot air balloons**~~ First Solo~~**(if instructional qualification for tethered flights required)**~~

~~19 Night Flying (if night instructional qualification required)~~

NOTE: Airmanship should be included as required in each exercise.

EXERCISE 1 - FAMILIARISATION WITH THE BALLOON

OBJECTIVE

To advise the student Instructor on how to familiarise the student with the balloon which will be used for the training and to test his position in the basket for comfort, visibility, and ability to use all controls and equipment**. Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to:

- present the type of balloon which will be used
- explain the characteristics of the balloon
- explain the components, instruments and equipment
- **explain the re-fuelling procedures (in the case of hot air balloons)**
- to familiarise the student with the balloon controls
- explain the differences when occupying the instructor’s position
- explain all check lists, drills, controls

EXERCISE 2 - PREPARATION FOR FLIGHT

OBJECTIVE:

To advise the student instructor on how to explain all the operations and necessary preparation to be completed prior to flight **Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the need for a pre-flight briefing.

- the structure and the content of this briefing

- which documents are required on board

- which equipment are required for a flight

- the use of weather forecasts/actuals

- the flight planning with particular regard to N**OTAMs**~~otams~~ / Airspace structure / Sensitive areas /

expected track and distance / pre-flight picture and possible landing fields

- the use of load calculation chart

- the selection of launch field with particular regard to permission, behaviour and adjacent fields

PRACTICAL EXERCISE

The student instructor has to prepare and give a pre-flight briefing.

The student instructor has to demonstrate:

- that the required documents are on board

- that the equipment required for the intended flight is on board

- how to advice the student to do the pre-planning procedures for each flight

- how to perform a pre-launch check

- how to select a launch field with particular regard to permission, behaviour and adjacent fields.

The student instructor also has to demonstrate:

- how to teach the student pilot to perform the preparation to be completed prior to flight

- how to analyse and correct errors **of the student pilot** as necessary

EXERCISE 3 - CREW AND PASSENGER BRIEFING

OBJECTIVES

To advise the student instructor on how to explain all the importance of correct clothing for pilot, passengers and crew and how to perform the briefing of ground- and retrieve crew and the briefing of passengers. **Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the correct clothing for passengers and crew

- the briefings for ground- and retrieve crew and passengers

PRACTICAL EXERCISE

The student instructor has to demonstrate:

- how to advise the passengers and crew about the correct clothing

- the briefing of ground- and retrieve crew

- the briefing of passengers

The student instructor also has to demonstrate:

- how to familiarise the student pilot with the different type of briefings

- how to analyse and correct errors **of the student pilot**

EXERCISE 4 - ASSEMBLY AND LAYOUT

OBJECTIVES

To advise the student instructor on how to familiarise the student pilot with the control of the crowd and how to perform the securing of launch site. Furthermore the student instructor has to demonstrate how to familiarise the student pilot with the correct rigging of envelope and basket, the burner test procedure (hot air balloons) and the pre-inflation checks. **Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the control of the crowd

- the securing of the launch site

- the correct rigging procedure

- the use of the restraint line

- the pre-inflation checks

PRACTICAL EXERCISE

The student instructor has to demonstrate:

- how to control of crowd and securing of launch site

- the correct rigging of envelope and basket

- the correct use of the restraint line

- the burner test procedure (hot air balloons)

- the pre-inflation checks

The student instructor also has to demonstrate:

- how to teach the student pilot to perform the correct rigging

- how to analyse and correct assembly errors **of the student pilot** as necessary

EXERCISE 5 – INFLATION

OBJECTIVES

To advise the student instructor on how to familiarise the student pilot with the different phases of the inflation procedure, the use of restraint line and inflation fan (hot air balloons) and the avoidance of electrostatic discharge (gas balloons). **Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the different phases of the inflation procedure
- the crowd control and securing procedures during inflation
- the use of ~~restraint line and~~ **the** inflation fan (hot air balloons)
- how to avoid electronic discharge (gas balloons)

PRACTICAL EXERCISE

The student instructor has to demonstrate:

- how to control of crowd and securing of launch site during inflation procedure
- the cold inflation procedure and use of restraint line and inflation fan (hot air balloons)
- the hot inflation procedure (hot air balloons)
- the avoidance of electrostatic discharge (gas balloons)
- the inflation procedure (gas balloons)

The student instructor also has to demonstrate:

- how to teach the student pilot to perform the inflation procedures
- how to analyse and correct errors **of the student pilot** during the inflation procedure as necessary

EXERCISE 6 – TAKE OFF IN DIFFERENT WIND CONDITIONS

OBJECTIVES

To advise the student instructor how to explain the pre take-off checks and briefings, the preparation for controlled climb and the use of restraint equipment: Furthermore the student instructor should be able to demonstrate the assessment of wind and obstacles, the preparation for false lift and the take off techniques in different wind conditions. **In addition to this the student instructor should learn how to identify student errors and how to correct them properly.**

BRIEFING

The student instructor has to explain:

- the pre take-off checks and briefings
- the preparation for controlled climb
- the "hands off / hands on" procedure for ground crew
- **the assessment of lift**
- the use of the restraint equipment
- the assessment of wind and obstacles
- the preparation for false lift

- the take off techniques from sheltered and non sheltered launch fields

PRACTICAL EXERCISE

The student instructor has to demonstrate:

- how to perform the pre take-off checks and briefings
- how to prepare for controlled climb
- how to perform the "hands off / hands on" procedure for ground crew
- **how to perform the assessment of lift without endangering the ground crew**
- how to use the restraint equipment
- how to perform the assessment of wind and obstacles
- how to prepare for false lift

The student instructor also has to demonstrate:

- how to teach the student pilot the correct take off techniques from sheltered and non sheltered launch fields
- how to analyse and correct errors **of the student pilot** as necessary

EXERCISE 7 – CLIMB TO LEVEL FLIGHT

OBJECTIVES

To advise the student instructor on how to explain and demonstrate the climb to flight level. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to explain:

- the climbing with a predetermined rate of climb
- the effect on envelope temperature (hot air balloons)
- the maximum rate of climb according to manufacturer's flight manual
- how to level off at selected altitude

AIR EXERCISE

The student instructor has to demonstrate:

- how to climb with a predetermined rate of climb
- how to perform look out techniques
- the effect on envelope temperature (hot air balloons)
- the maximum rate of climb according to manufacturer's flight manual
- the levelling off techniques at selected altitude

The student instructor also has to demonstrate:

- how to advise the student pilot to perform the climb to level flight
- how to analyse and correct faults / errors **of the student pilot** during the climb

- airmanship

EXERCISE 8 – LEVEL FLIGHT

OBJECTIVES

To advise the student instructor on how to explain and demonstrate level flight. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to explain:

- how to maintain level flight by use of instruments
- how to maintain level flight by use of visual references
- how to maintain level flight by use of all available means
- the use of parachute
- the use of turning vents if installed (hot air balloons)

AIR EXERCISE

The student instructor has to demonstrate:

- how to maintain level flight by use of instruments
- how to maintain level flight by use of visual references
- how to maintain level flight by use of all available means
- the use of parachute
- the use of turning vents if installed (hot air balloons)

The student instructor also has to demonstrate:

- how to advise the student pilot to perform the level flight
- how to analyse and correct faults / errors **of the student pilot** during the level flight
- airmanship

EXERCISE 9 – DESCENT TO LEVEL FLIGHT

OBJECTIVES

To advise the student instructor on how to explain and demonstrate the descent to a certain flight level. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to explain:

- how to descent with a predetermined rate of descent
- a fast descent
- the maximum rate of descent according to manufacturer’s flight manual
- the use of parachute

- a parachute stall and cold descent (hot air balloons)
- the levelling off technique at selected altitude

AIR EXERCISE

The student instructor has to demonstrate:

- a descent with a predetermined rate of descent
- how to perform look out techniques
- a fast descent
- the maximum rate of descent according to manufacturer's flight manual
- the use of parachute
- how to level off at selected altitudes

The student instructor also has to demonstrate:

- how to advise the student pilot to perform a descent to a certain flight level
- how to analyse and correct faults / errors **of the student pilot** during the descent
- airmanship

EXERCISE 10 – EMERGENCIES

OBJECTIVES

To advise the student instructor on how to explain and demonstrate the different emergency situations and how to react. Furthermore the student instructor should learn how to identify student errors during the simulated emergency exercises and how to correct them properly.

BRIEFING

The student instructor has to explain:

- the pilot light failure (hot air balloons)
- burner failures, valve leaks, flame out and re-light (hot air balloons)
- gas leaks
- closed appendix during take-off and climb (gas balloons)
- the envelope over temperature (hot air balloons)
- envelope damage in flight
- the parachute / rapid deflation system failure
- fire on ground and in the air
- how to avoid an obstacle contact including contact with electrical power lines
- escape drills, location and use of emergency equipment

AIR EXERCISE

The student instructor has to demonstrate:

- a pilot light failure (hot air balloons)

- a burner failure, valve leaks, flame out and re-light (hot air balloons)
- gas leaks
- a closed appendix during take-off and climb (gas balloons)
- envelope over temperature (hot air balloons)
- envelope damage in flight
- parachute / rapid deflation system failure
- a fire on ground and in the air
- the escape drills, location and use of emergency equipment

The student instructor also has to demonstrate:

- how to advise the student pilot in performing the different emergency drills
- how to analyse and correct ~~-~~faults / errors **of the student pilot**
- airmanship

EXERCISE 11 – NAVIGATION

OBJECTIVES

To advise the student instructor on how to explain and demonstrate the advanced navigational flight preparation. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to explain:

- the maps selection
- the plotting of the expected track
- the marking of positions and time
- the calculation of distance and speed
- the calculation of fuel consumption (hot air balloons)
- the calculation of ballast consumption (gas balloons)
- the ceiling limitations (ATC, Weather)
- how to plan ahead
- the monitoring of weather development
- the monitoring of fuel / ballast consumption
- ATC liaison (if applicable)
- the communication with retrieve crew
- the use of GNSS ~~(if applicable)~~

AIR EXERCISE

The student instructor has to demonstrate:

- the use of selected maps
- the plotting of the expected track

- the marking of positions and time
- how to monitor of distance and speed
- how to monitor the fuel / ballast consumption
- the observance of ceiling limitations (ATC, Weather)
- the planning ahead
- the monitoring of weather development
- the monitoring of envelope temperature (hot air balloons)
- ATC liaison (if applicable)
- communication with retrieve crew
- use of GNSS ~~(if applicable)~~

The student instructor also has to demonstrate:

- how to advise the student pilot in performing the navigational preparation
- how to advise the student pilot in performing the different navigational in-flight tasks
- how to analyse and correct faults / errors **of the student pilot**
- airmanship

EXERCISE 12 A – FUEL MANAGEMENT HOT AIR BALLOONS

OBJECTIVES

To advise the student instructor on how to explain and demonstrate the fuel management techniques. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to explain:

- the cylinder arrangement and the burner systems
- the function of the pilot light supply (vapour/liquid)
- the use of master cylinders (if applicable)
- the fuel requirement and expected fuel consumption
- the fuel state and pressure
- the minimum fuel reserves
- cylinder contents gauge and change procedure
- the use of cylinder manifolds

AIR EXERCISE

The student instructor has to demonstrate:

- the cylinder arrangement and burner systems
- the pilot light supply (vapour/liquid)
- the use of master cylinders (if applicable)

- how to monitor of fuel requirement and expected fuel consumption
- the monitoring of fuel state and pressure
- the monitoring of fuel reserves
- the use of cylinder contents gauge and change procedure
- the use of cylinder manifolds

The student instructor also has to demonstrate:

- how to advise the student pilot to perform the fuel management
- how to analyse and correct faults / errors **of the student pilot**
- airmanship

EXERCISE 12 B– BALLAST MANAGEMENT GAS BALLOONS

OBJECTIVES

To advise the student instructor on how to explain and demonstrate the ballast management. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to explain:

- the minimum ballast
- the arrangement and securing of ballast
- the ballast requirement and expected ballast consumption
- the ballast reserves

AIR EXERCISE

The student instructor also has to demonstrate:

- the arrangement of minimum ballast
- the arrangement and securing of ballast
- the ballast requirement calculation and expected ballast consumption
- how to secure ballast reserves

The student instructor also has to demonstrate:

- how to advise the student pilot to perform the ballast management
- how to analyse and correct faults / errors **of the student pilot**
- airmanship

EXERCISE 13 – APPROACH FROM LOW LEVEL

OBJECTIVES

To advise the student instructor on how to explain and demonstrate the approach from level. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to explain:

- the pre landing checks
- **passenger pre-landing briefing**
- the selection of field
- the use of burner and parachute (hot air balloons)
- the use of ballast / parachute and valve (gas balloons)
- the use of trail rope (if applicable) (gas balloons)
- the look out
- missed approach / fly on procedures

AIR EXERCISE

The student instructor has to demonstrate:

- the use of the pre landing checks
- the selection of fields
- the use of burner and parachute (hot air balloons)
- the use of ballast / parachute and valve (gas balloons)
- the use of trail rope (if applicable) (gas balloons)
- the look out procedures and how to avoid possible distractions
- the missed approach / fly on techniques

The student instructor also has to demonstrate:

- how to advise the student pilot to perform an approach from low level
- how to analyse and correct faults / errors **of the student pilot**
- airmanship

EXERCISE 14– APPROACH FROM HIGH LEVEL

OBJECTIVES

To advise the student instructor on how to explain and demonstrate the approach from high level. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to explain:

- the pre landing checks
- **passenger pre-landing briefing**
- the selection of field
- the rate of descent
- the use of burner and parachute (hot air balloons)
- the use of ballast and parachute (gas balloons)

- the use of trail rope (if applicable) (gas balloons)

- the look out

- the missed approach / fly on procedures

AIR EXERCISE

The student instructor has to demonstrate:

- the pre landing checks

- the selection of field

- the rate of descent

- the use of burner and parachute (hot air balloons)

- the use of ballast and parachute (gas balloons)

- the use of trail rope (if applicable) (gas balloons)

- the look out procedures and how to avoid potential distraction

- the missed approach / fly on techniques

The student instructor also has to demonstrate:

- how to advise the student pilot to perform an approach from a higher level

- how to analyse and correct faults / errors **of the student pilot**

- airmanship

EXERCISE 15 – OPERATING AT LOW LEVEL

OBJECTIVES

To advise the student instructor on how to explain and demonstrate the operation at a low height. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to explain:

- the use of burner and parachute (hot air balloons)

- the use of ballast and parachute (gas balloons)

- the look out

- how to avoid a contact with low level obstacles

- how to avoid sensitive areas (e.g. nature protection areas)

- landowner relations

AIR EXERCISE

The student instructor has to demonstrate:

- the use of burner and parachute (hot air balloons)

- the use of ballast and parachute (gas balloons)

- the look out procedures and how to avoid potential distraction

- how to avoid low level obstacles

- good landowner relations

The student instructor also has to demonstrate:

- how to advise the student pilot to operate the balloon at a low level
- how to analyse and correct faults / errors **of the student pilot**
- airmanship

EXERCISE 16 – Landing in different wind conditions

OBJECTIVES

To advise the student instructor on how to explain and demonstrate landings in different wind conditions. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to explain:

- the correct actions for turbulences during the approach / landing
- **the passenger pre-landing briefing**
- the use of burner and pilot lights (hot air balloons)
- the use of ballast / parachute / valve and rip panel (gas balloons)
- the use of parachute and turning vents (if applicable)
- the look out
- the landing, dragging and deflation
- landowner relations

AIR EXERCISE

The student instructor has to demonstrate:

- the pre landing checks
- **the passenger briefing**
- the selection of field
- the effect of turbulence
- the use of burner and pilot lights (hot air balloons)
- the use of ballast / parachute / valve and rip panel (gas balloons)
- the use of parachute and turning vents (if applicable)
- the look out procedures and how to avoid potential distraction
- the landing, dragging and deflation procedures

The student instructor also has to demonstrate:

- how to advise the student pilot to perform a safe landing in different wind conditions
- how to analyse and correct faults / errors **of the student pilot**
- airmanship

~~**EXERCISE 17 – TETHERED FLIGHT HOT AIR BALLOONS**~~

~~OBJECTIVES~~

~~To advise the student instructor on how to explain and demonstrate the tethering techniques. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.~~

~~BRIEFING~~

~~The student instructor has to explain:~~

~~– the ground preparations~~

~~– the weather suitability~~

~~– the tethering techniques and equipment~~

~~– the maximum all-up-weight limitation~~

~~– the crowd control~~

~~– the pre take-off checks and briefings~~

~~– the heating for controlled lift off~~

~~– the "Hands off / Hands on" procedure for ground crew~~

~~– the assessment of wind and obstacles~~

~~AIR EXERCISE~~

~~The student instructor has to demonstrate:~~

~~– the ground preparations~~

~~– the tethering techniques~~

~~– the reason for maximum all-up-weight limitation~~

~~– how to perform the crowd control~~

~~– the pre take-off checks and briefings~~

~~– the heating for controlled lift off~~

~~– the "Hands off / Hands on" procedure for ground crew~~

~~– the assessment of wind and obstacles~~

~~– the landing techniques~~

~~The student instructor also has to demonstrate:~~

~~– how to advise the student pilot to perform a tethered flight~~

~~– how to analyse and correct faults / errors~~

~~– airmanship~~

EXERCISE 17~~8~~– FIRST SOLO

OBJECTIVE

To advise the student instructor on how to prepare their students for the first solo flight.

BRIEFING

The student instructor has to explain

- the limitations of the flight
- the use of required equipment

AIR EXERCISE

The student instructor has to

- check with another/more senior instructor if the student can fly solo
- monitor the pre-flight preparation
- brief the student (expected flight time / emergency actions)
- monitor the flight as far as possible
- debrief the flight with the student

EXERCISE 18 – TETHERED FLIGHT HOT AIR BALLOONS (if tethered flight instructional qualification is required)

OBJECTIVES

To advise the student instructor on how to explain and demonstrate the tethering techniques. Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to explain:

- the ground preparations

- the weather suitability

- the tethering techniques and equipment

- the maximum all-up-weight limitation

- the crowd control

- the pre take-off checks and briefings

- the heating for controlled lift off

- the "Hands off / Hands on" procedure for ground crew

- the assessment of wind and obstacles

- the controlled climb to a pre-defined altitude (at least 60 ft)

AIR EXERCISE

The student instructor has to demonstrate:

- the ground preparations

- the tethering techniques

- the reason for maximum all-up-weight limitation

- how to perform the crowd control

- the pre take-off checks and briefings

- the heating for controlled lift off

- the "Hands off / Hands on" procedure for ground crew

- the assessment of wind and obstacles

- the controlled climb

- the landing techniques

The student instructor also has to demonstrate:

- how to advise the student pilot to perform a tethered flight

- how to analyse and correct faults / errors of the student pilot

- airmanship

EXERCISE 19 - NIGHT FLYING (if night instructional qualification required)

OBJECTIVES

To advise the student instructor on how to explain and demonstrate the night flying techniques. Furthermore the student instructor should learn how to identify student errors and how to correct them properly.

BRIEFING

The student instructor has to explain:

- the medical/physiological aspects of night vision

- the use of lights for assembly, layout and inflation

- the requirement for torch to be carried, (pre-flight inspection, etc.)

- the use of the external- and instrument lights

- the night take-off procedure

- the checklist procedures at night

- the emergency procedures at night

- the navigation principles at night

- map marking for night use, (highlighting built up/lit areas with thicker lines, etc.)

AIR EXERCISE

The student instructor has to demonstrate:

- the use of lights for assembly, layout and inflation

- the use of torch for pre-flight inspection

- the use of external- and instrument lights

- the night take-off procedure

- how to perform the checklist procedures at night

- simulated night emergency procedures

- night cross country techniques, as appropriate

The student instructor also has to demonstrate:

- how to advise the student pilot to perform a flight at night

- how to analyse and correct faults / errors **of the student pilot**

- airmanship

AMC No 1 to FCL.940.LAFI(a)(2)

Light Aircraft Flight Instructor (LAFI) refresher seminar

1. LAFI refresher seminars made available in member States should have due regard to geographical location, numbers attending, and periodicity throughout the State concerned.
2. Such seminars should run for at least one day, and attendance from participants will be required for the whole duration of the seminar including breakout groups/workshops.
3. Some experienced LAFIs/FIs currently involved with flying training and with a practical understanding of the revalidation requirements and current instructional techniques should be included as speakers at these seminars.
4. The attendance form will be completed and signed by the organiser of the seminar as approved by the Authority, following attendance and satisfactory participation by the LAFI.
5. The content of the LAFI refresher seminar should be selected from the following:
   a. new and/or current applicable rules/regulations with emphasis on knowledge of Part-FCL
   b. teaching and learning;
   c. instructional techniques;
   d. the role of the instructor;
   e. national regulations (as applicable);
   f. human performance and limitations;
   g. flight safety, incident and accident prevention;
   h. airmanship;
   i. legal aspects and enforcement procedures;
   j. navigational skills including new/current radio navigation aids;
   l. weather related topics including methods of distribution.
   m. any additional topic
6. Formal sessions should allow for a presentation time of 45 minutes, with at least 15 minutes for questions and discussion. The use of visual aids is recommended, with inter-active video/beamer sessions and other modern teaching aids (where available) for break-out groups/workshops.

AMC No 1 to FCL.930.FI

FI training course

GENERAL

1. The aim of the FI course is to train aircraft licence holders to the level of competence defined in FCL.920.

2. The course should develop safety awareness throughout by teaching the knowledge, skills and attitudes relevant to the FI task including at least the following:

a. refresh the technical knowledge of the student instructor;

b. train the student instructor to teach the ground subjects and air exercises;

c. ensure that the student instructor's flying is of a sufficiently high standard; and

d. teach the student instructor the principles of basic instruction and to apply them at the PPL, SPL or SPL level.

FLIGHT INSTRUCTION

3. In the case of the FI(A), FI(H) or FI(As) the remaining five hours in FCL.930.FI (b)(~~2~~**3**) may be mutual flying (that is, two applicants flying together to practice flight demonstrations).

4. The skill test is additional to the course training time.

CONTENT

5. The course consists of 2 parts:

- Part 1, **theoretical knowledge including the** teaching and learning instruction that should comply with AMC to FCL.920**. The content of the teaching and learning Part of the LAFI course, as established in AMC to FCL.930.LAFI, may be used as guidance to develop the course syllabus.**
- Part 2, flight instruction that should have the following content:

A. Aeroplanes

Part 2

AIR EXERCISES

1. The air exercises are similar to those used for the training of PPL(A) but with additional items designed to cover the needs of a flight instructor.

2. The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide: therefore the demonstrations and practices need not necessarily be given in the order listed. The actual order and content will depend upon the following interrelated factors:

- The applicant's progress and ability
- The weather conditions affecting the flight
- The flight time available
- Instructional technique considerations
- The local operating environment

3. It follows that student instructors will eventually be faced with similar interrelated factors. They should be shown and taught how to construct flight lesson plans, taking these factors into account, so as to make the best use of each flight lesson, combining parts of the set exercises as necessary.

GENERAL

4**.** The briefing normally includes a statement of the aim and a brief allusion to principles of flight only if relevant. An explanation is to be given of exactly what air exercises are to be taught by the instructor and practised by the student during the flight. It should include how the flight will be conducted with regard to who is to fly the aeroplane and what airmanship, weather and flight safety aspects currently apply. The nature of the lesson will govern the order in which the constituent parts are to be taught.

5**.** The ~~four~~ **4** basic components of the briefing will be:

~~1~~**a** The aim

~~2~~**b** Principles of Flight (briefest reference only)

~~3~~**c** The Air Exercise(s) (what, and how and by whom)

~~4~~**d** Airmanship (weather, flight safety etc.)

PLANNING OF FLIGHT LESSONS

6**.** The preparation of lesson plans is an essential pre-requisite of good instruction and the student instructor is to –be given supervised practice in the planning and practical application of flight lesson plans.

GENERAL CONSIDERATIONS

7**.** The student instructor should complete flight training to practise the principles of basic instruction at the PPL(A) level.

8**.** During this training, except when acting as a student pilot for mutual flights, the student instructor occupies the seat normally occupied by the FI(A).

9**.** It is to be noted that airmanship is a vital ingredient of all flight operations. Therefore, in the following air exercises the relevant aspects of airmanship are to be stressed at the appropriate times during each flight.

10**.** If the privileges of the FI(A) certificate are to include instruction for night flying, exercises 12 and 13 of the flight instruction syllabus should be undertaken at night in addition to by day either as part of the course or subsequent to certification issue.

FLIGHT INSTRUCTION SYLLABUS CONTENTS

LONG BRIEFINGS AND AIR EXERCISES

~~1 Familiarisation with the aeroplanes~~

~~2 Preparation before and action after flight~~

~~3 Air experience~~

~~4 Effects of controls~~

~~5 Taxiing~~

~~6 Straight and level flight~~

~~7 Climbing~~

~~8 Descending~~

~~9 Turning~~

~~10A Slow flight~~

~~10B Stalling~~

~~11A Spin recovery at the incipient stage~~

~~11B Developed spins – entry & recovery~~

~~12 Take-off and climb to downwind position~~

~~13 The circuit, approach and landing~~

~~14 First solo~~

~~15 Advanced turning~~

~~16 Forced landing without power~~

~~17 Precautionary landing~~

~~18A Pilot navigation~~

~~18B Navigation at lower levels/reduced visibility~~

~~18C Radio navigation~~

~~19 Introduction to Instrument Flying~~

~~20 Basic night flight~~

NOTE: Although exercise 11B is not required for the PPL course it is a requirement for the FI course.

LONG BRIEFING EXERCISE 1 - AEROPLANE FAMILIARISATION

OBJECTIVES

Introduction to the aeroplane

Explanation of the cockpit layout

Aeroplane and engine systems

Check lists, drills, controls

Propeller safety

- Precautions general
- Precautions before and during hand turning
- Hand swinging technique for starting (if applicable to type)

Differences when occupying the instructor's seat

EMERGENCY DRILLS

Action in the event of fire in the air and on the ground – engine cabin and electrical

Systems failures as applicable to type

Escape drills – location and use of emergency equipment and exits

AIR EXERCISE 1

FAMILIARISATION WITH THE AEROPLANE

Introduction to the Aeroplane

Explanation of the Cockpit Layout

Aeroplane Systems

Check Lists, Drills, Controls

EMERGENCY DRILLS

Action in the Event of Fire in the Air and on the Ground –Engine/Cabin/Electrical

System Failure as Applicable to Type

Escape Drills – Location and use of Emergency Equipment and Exits

LONG BRIEFING EXERCISE 2 - PREPARATION FOR AND ACTION AFTER FLIGHT

OBJECTIVES

Flight authorisation and aeroplane acceptance including technical log (if applicable) and certificate of maintenance

Equipment required for Flight (Maps, etc.)

External checks

Internal checks

Student comfort, harness, seat or rudder pedal adjustment

Starting and Warming up Checks

Power Checks

Running Down, System Checks and Switching Off the Engine

Leaving the Aeroplane, Parking, Security and Picketing

Completion of Authorisation Sheet and Aeroplane Serviceability Documents

AIR EXERCISE 2

PREPARATION FOR AND ACTION AFTER FLIGHT

Flight Authorisation and Aeroplane Acceptance

Aircraft Serviceability Documents

Equipment Required for Flight (Maps etc.)

External Checks

Internal Checks

Student Comfort, Harness, Seat or Rudder Pedal Adjustment

Starting and Warming up Checks

Power Checks

Running Down, System Checks and Switching Off the Engine

Leaving the Aircraft, Parking, Security and Picketing

Completion of Authorisation Sheet and Aeroplane Serviceability Documents

LONG BRIEFING EXERCISE 3 – AIR EXPERIENCE

(Air Exercise only)

AIR EXERCISE 3

Air Experience

LONG BRIEFING EXERCISE 4 - EFFECTS OF CONTROLS

OBJECTIVES

Function of Primary Controls – when Laterally Level and Banked

Further Effect of Ailerons and Rudder

Effect of Inertia

Effect of Airspeed

Effect of Slipstream

Effect of Power

Effect of Trimming Controls

Effect of Flaps

Operation of Mixture Control

Operation of Carburettor Heat Control

Operation of Cabin Heat/Ventilation Systems

Effect of other Controls (as applicable)

Airmanship

AIR EXERCISE 4

EFFECTS OF CONTROLS

Primary Effects of Flying Controls – when Laterally Level and Banked

Further effects of Ailerons and Rudder

Effect of Airspeed

Effect of Slipstream

Effect of Power

Effect of Trimming Controls

Effect of Flaps

Operation of Mixture Control
Operation of Carburettor Heat Control
Operation of Cabin Heat/Ventilation Systems
Effect of other Controls as applicable
Airmanship

LONG BRIEFING EXERCISE 5 - TAXIING

OBJECTIVES:
Pre-Taxiing Checks
Starting, Control of Speed and Stopping
Engine Handling
Control of Direction and Turning (including manoeuvring in confined spaces)
Parking Area Procedures and Precautions
Effects of Wind and Use of Flying Controls
Effects of Ground Surface
Freedom of Rudder Movement
Marshalling Signals
Instrument Checks
Airmanship and Air Traffic Control Procedures
Common Errors
EMERGENCIES
Steering Failure/Brake Failure
AIR EXERCISE 5
TAXIING
Pre Taxiing Checks
Starting, Control of Speed and Stopping
Engine Handling
Control of Direction and Turning
Turning in Confined Spaces
Parking Area Procedures and Precautions
Effects of Wind and Use of Flying Control
Effects of Ground Surface
Freedom of Rudder Movement
Marshalling Signals
Instrument Checks
Airmanship and Air Traffic Control Procedures

EMERGENCIES

Steering Failure/Brake Failure

LONG BRIEFING EXERCISE 6 - STRAIGHT AND LEVEL FLIGHT

OBJECTIVES:

The Forces

Longitudinal Stability and Control in Pitch

Relationship of C of G to Control in Pitch

Lateral and Directional Stability (Control of Lateral Level and Balance)

Attitude and Balance Control

Trimming

Power Settings and Airspeeds

Drag and Power Curves

Range and Endurance

Airmanship

Common Errors

AIR EXERCISE 6

STRAIGHT AND LEVEL

At normal Cruising Power:

Attaining and Maintaining Straight and Level Flight

Demonstration of Inherent Stability

Control in Pitch, including use of Elevator Trim control

Lateral Level, Direction and Balance, use of Rudder Trim controls as applicable at Selected Airspeeds (Use of Power):

Effect of Drag and use of Power (Two Airspeeds for one Power Setting)

Straight and Level in Different Aeroplane Configurations (Flaps, Landing Gear)

Use of Instruments to achieve Precision Flight

Airmanship

LONG BRIEFING EXERCISE 7 - CLIMBING

OBJECTIVES:

The Forces

Relationship between Power/Airspeed and Rate of Climb (Power Curves Maximum Rate of Climb (Vy))

Effect of Mass

Effect of Flaps

Engine Considerations

Effect of density Altitude

The Cruise Climb

Maximum Angle of Climb (Vx)

Airmanship

Common Errors

AIR EXERCISE 7

CLIMBING

Entry and maintaining the normal Maximum Rate Climb

Levelling Off

Levelling Off at Selected Altitudes

Climbing with Flaps down

Recovery to normal Climb

En Route Climb (Cruise Climb)

Maximum Angle of Climb

Use of Instruments to achieve Precision Flight

Airmanship

LONG BRIEFING EXERCISE 8 - DESCENDING

OBJECTIVES:

The Forces

Glide Descent Angle – Airspeed – Rate of Descent

Effect of Flaps

Effect of Wind

Effect of Mass

Engine Considerations

Power Assisted Descent – Power/Airspeed – Rate of Descent

The Cruise Descent

The Sideslip

Airmanship

Common Errors

AIR EXERCISE 8

DESCENDING

Entry and maintaining the Glide

Levelling Off

Levelling Off at Selected Altitudes

Descending with Flaps down

Powered Descent – Cruise Descent (inc. effect of Power/Airspeed)

Sideslipping (on suitable types)

Use of Instrument to achieve Precision Flight

Airmanship

LONG BRIEFING EXERCISE 9 - TURNING

OBJECTIVES:

The Forces

Use of Controls

Use of Power

Maintenance of Attitude and Balance

Medium Level Turns

Climbing and Descending Turns

Slipping Turns

Turning onto Selected Headings – Use of Gyro Heading Indicator and Magnetic Compass

Airmanship

Common Errors

AIR EXERCISE 9

TURNING

Entry and maintaining Medium Level Turns

Resuming straight flight

Faults in the Turn (incorrect Pitch, Bank, Balance)

Climbing Turns

Descending Turns

Slipping Turns (on suitable types)

Turns to Selected Headings, use of Gyro Heading Indicator and Compass

Use of Instruments to achieve Precision flight

Airmanship

STALL/SPIN AWARENESS & AVOIDANCE

TRAINING CONSISTS OF EXERCISES:

10 A, 10 B and 11 A

LONG BRIEFING EXERCISE 10 A - SLOW FLIGHT

OBJECTIVES:

Aeroplane Handling Characteristics during Slow Flight at

V_{s1} & V_{so} + 10 knots

V_{s1} & V_{so} + 5 knots

Slow Flight During Instructor Induced Distractions

Effect of overshooting in configurations where application of engine power causes a strong 'nose-up' trim change

Airmanship

Common Errors

AIR EXERCISE 10 A

SLOW FLIGHT

Airmanship

Safety Checks

Introduction to Slow Flight

Controlled Slow Flight in the Clean Configuration at:

V_{s1} + 10 knots & with Flaps Down

V_{so} + 10 knots:

Straight & Level Flight

Level Turns

Climbing & Descending

Climbing & Descending Turns

Controlled Slow Flight in the Clean Configuration at:

V_{s1} + 5 knots & with Flaps Down

V_{so} + 5 knots:

Straight & Level Flight

Level Turns

Climbing & Descending

Climbing & Descending Turns

Descending 'Unbalanced' Turns at Low Airspeed –

the need to maintain Balanced Flight

'Instructor Induced Distractions' during Flight at Low Airspeed – the need to Maintain Balanced Flight and a safe Airspeed

Effect of going around in configurations where application of engine power causes a strong 'nose up' trim change

LONG BRIEFING EXERCISE 10 - STALLING

OBJECTIVES:

Characteristics of the Stall

Angle of Attack

The Effectiveness of the Controls at the Stall

Factors Affecting the Stalling Speed:

Effect of Flaps/Slats/Slots

Effect of Power/Mass/C of G/Load Factor

The Effects of Unbalance at the Stall

The Symptoms of the Stall

Stall Recognition & Recovery

Stalling & Recovery:

Without Power

With Power On

With Flaps Down

Maximum Power Climb (straight & turning flight to the point of Stall with uncompensated Yaw)

* Stalling & Recovery during manoeuvres involving more than 1 G (accelerated stalls, including secondary stalls & recoveries)

Recovering from Incipient Stalls in the landing and other configurations and conditions

Recovering at the Incipient Stage during Change of Configuration

Stalling and Recovery at the Incipient Stage with 'Instructor Induced' Distractions

Airmanship

Common Errors

* Consideration is to be given to manoeuvre limitations and references to The Owners/Flight manual or Pilot's Operating Handbook in relation to Mass and Balance limitations. These factors are also covered in the next exercise Spinning.

AIR EXERCISE 10 B

STALLING

Airmanship – Safety checks

The symptoms of the Stall

Stall Recognition & Recovery

Recovery Without Power

Recovery With Power

Recovery when a Wing Drops at the Stall

Stalling with Power 'ON' & Recovery

Stalling with Flap 'Down' & Recovery

Maximum Power Climb (straight & turning flight) to the point of Stall with uncompensated YAW – Effect of unbalance at the stall when climbing power is being used.

> * Stalling & Recovery during Manoeuvres involving more than 1 G (accelerated stalls, including secondary stalls & recoveries)

Recoveries from Incipient Stalls in the landing and other configurations & conditions

Recoveries at the Incipient Stage during change of Configuration

Instructor Induced Distractions during Stalling

> * Consideration of manoeuvre limitations and the need to refer to the Aeroplane Manual and Weight (mass) & Balance calculations. These factors are to be covered in the next exercise – Spinning.

LONG BRIEFING EXERCISE 11 A - SPIN RECOVERY AT THE INCIPIENT STAGE

OBJECTIVES:

Causes, Stages, Autorotation and Characteristics of the Spin

Recognition and Recovery at the Incipient Stage – entered from various flight attitudes

Aeroplane Limitations

Airmanship

Common Errors

AIR EXERCISE 11 A

SPIN RECOVERY at the INCIPIENT STAGE

Aeroplane Limitations

Airmanship

Safety Checks

Recognition at the Incipient Stage of a Spin

Recoveries from Incipient Spins entered from various attitudes with the Aeroplane in the Clean Configuration including instructor induced distractions.

LONG BRIEFING EXERCISE 11 B - SPIN RECOVERY AT THE DEVELOPED STAGE

OBJECTIVES:

The Spin Entry

Recognition & Identification of Spin Direction

The Spin Recovery

Use of Controls

Effects of Power/Flaps (flap restriction applicable to type)

Effect of the C of G upon Spinning characteristics

Spinning from Various Flight Attitudes

Aeroplane Limitations

Airmanship – Safety Checks

Common Errors during Recovery

AIR EXERCISE 11 B

SPIN RECOVERY at the DEVELOPED STAGE

Aeroplane Limitations

Airmanship

Safety Checks

The Spin Entry

Recognition & Identification of the Spin Direction

The Spin Recovery (reference to Flight Manual)

Use of Controls

Effects of Power/Flaps (restrictions applicable to aeroplane type)

Spinning & Recovery from various Flight Attitudes

LONG BRIEFING EXERCISE 12 - TAKE-OFF AND CLIMB TO DOWNWIND POSITION

OBJECTIVES:

Handling – Factors affecting the length of Take-off Run and Initial Climb

The Correct Lift Off Speed, use of Elevators (Safeguarding the Nose Wheel), Rudder and Power

Effect of Wind (including Crosswind Component)

Effect of Flaps (including the Decision to Use and the Amount Permitted)

Effect of Ground Surface and Gradient upon the Take-off Run

Effect of Mass, Altitude and Temperature on Take-off and climb Performance

Pre Take-Off Checks

Air Traffic Control Procedure (before Take-Off)

Drills, during and after Take-off

Noise abatement procedures

Tail Wheel Considerations (as applicable)

Short/Soft Field Take-Off Considerations/Procedures

EMERGENCIES:

Aborted Take-Off

Engine Failure after Take-Off

Airmanship and Air Traffic Control Procedures

Common Errors

AIR EXERCISE 12

TAKE-OFF AND CLIMB TO DOWNWIND POSITION

Pre Take-Off Checks

Into Wind Take-Off

Safeguarding the Nose Wheel

Crosswind Take-Off

Drills During and After Take-Off

Short Take-Off and Soft Field Procedure/Techniques (including Performance Calculations)

Noise abatement procedures

Airmanship

LONG BRIEFING EXERCISE 13 - THE CIRCUIT APPROACH AND LANDING

OBJECTIVES:

The Downwind Leg, Base Leg, Approach – Position and Drills

Factors Affecting the Final Approach and the Landing Run

Effect of Mass

Effects of Altitude and Temperature

Effect of Wind

Effect of Flap

The Landing

Effect of Ground Surface and Gradient upon the Landing Run

Types of Approach and Landing:

Powered

Crosswind

Flapless (at an appropriate stage of the course)

Glide

Short Field

Soft Field

Tail Wheel Aeroplane Considerations (as applicable)

Missed Approach

Engine Handling

Wake Turbulence Awareness

Windshear Awareness

Airmanship and Air Traffic Control Procedures

Mislanding/Go around

Special emphasis on lookout

Common Errors

AIR EXERCISE 13

THE CIRCUIT APPROACH AND LANDING

Circuit Procedures – Downwind, Base Leg

Powered Approach and Landing

Safeguarding the Nosewheel

Effect of Wind on Approach and Touchdown Speeds and use of Flaps

Crosswind Approach and Landing

Glide Approach and Landing

Flapless Approach and Landing (short and soft field)

Short field and soft field procedures

Wheel Landing (Tail Wheel Aircraft)

Missed Approach/Go around

Mislanding/Go around

Noise abatement procedures

Airmanship

LONG BRIEFING EXERCISE 14 - FIRST SOLO AND CONSOLIDATION

A summary of points to be covered before sending the student on first solo.

NOTE: During the flights immediately following the solo circuit consolidation period the following should be covered:

Procedures for Leaving and Rejoining the Circuit

The Local Area (Restrictions, Controlled Airspace, etc.)

Compass Turns

QDM Meaning and Use

Airmanship

Common Errors

AIR EXERCISE 14

FIRST SOLO AND CONSOLIDATION

During the flights immediately following the solo circuit consolidation period the following should be covered:

Procedures for Leaving and Rejoining the Circuit

The Local Area (Restrictions, Controlled Airspace, etc.)

Compass Turns

Obtaining QDM's

Airmanship

LONG BRIEFING EXERCISE 15 - ADVANCED TURNING

OBJECTIVES:

The Forces

Use of Power

Effect of Load Factor:

Structural Considerations

Increased Stalling Speed

Physiological Effects

Rate and Radius of Turn

Steep, Level, Descending and Climbing Turns

Stalling in the Turn

* Spinning from the Turn – Recovery at the Incipient Stage

* The Spiral Dive

Unusual Attitudes and Recoveries

Airmanship

Common Errors

* Considerations are to be given to manoeuvre limitations and reference to The Owner's/Flight Manual/Pilot's Operating Handbook in relation to Mass and Balance, and any other restrictions for Practice Entries to the Spin.

AIR EXERCISE 15

ADVANCED TURNING

Level, Descending and Climbing Steep Turns

Stalling in the Turn

The Spiral Dive

Spinning from the Turn

Recovery from Unusual Attitudes

Maximum Rate Turns

Airmanship

LONG BRIEFING EXERCISE 16 - FORCED LANDING WITHOUT POWER

OBJECTIVES:

Selection of forced landing areas

Provision for change of plan

Gliding distance – consideration

Planning the descent

Key positions

Engine failure checks

Use of radio – R/T ‘Distress’ Procedure

The base leg

The final approach

Go around

The landing considerations

Actions after landing – Aeroplane security

Causes of engine failure

Airmanship

Common errors

AIR EXERCISE 16

FORCED LANDING WITHOUT POWER

Forced Landing Procedures

Selection of Landing Area:

Provision for Change of Plan

Gliding Distance Considerations

Planning the descent:

Key Positions

Engine Failure Checks

Engine cooling precautions

Use of Radio

The Base Leg

The Final Approach

The Landing) When the Exercise is

Actions after Landing:) conducted at an

Aeroplane Security) Aerodrome

Airmanship

LONG BRIEFING EXERCISE 17 - PRECAUTIONARY LANDING

OBJECTIVES:

Occasions when necessary (In Flight Conditions):

Landing area Selection and Communication (R/T Procedure)

Overhead Inspection

Simulated Approach

Climb Away

Landing at a Normal Aerodrome

Landing at a Disused Aerodrome

Landing on an Ordinary Field

Circuit and Approach

Actions After Landing:

Aeroplane Security

Airmanship

Common errors

AIR EXERCISE 17 - PRECAUTIONARY LANDING

Occasions when necessary (In Flight Conditions):

Landing area selection

Overhead Inspection

Simulated Approach

Climb Away

Landing at a Normal Aerodrome

Landing at a Disused Aerodrome

Landing on an Ordinary Field

Circuit and Approach

Actions After Landing:

Aeroplane Security

Airmanship

LONG BRIEFING EXERCISE 18A - PILOT NAVIGATION

OBJECTIVES:

Flight Planning

Weather Forecast and Actual(s)

Map Selection and Preparation:

Choice of Route:

Regulated/Controlled Airspace

Danger, Prohibited and Restricted Areas

Safety Altitude

Calculations:

Magnetic Heading(s) and Time(s) enroute

Fuel Consumption

Mass and Balance

Mass and Performance

Flight Information:

NOTAMs etc.

Noting of Required Radio Frequencies

Selection of Alternate aerodrome(s)

Aircraft Documentation

Notification of the Flight:

Booking Out Procedure

Flight Plans

Aerodrome Departure

Organisation of Cockpit Workload

Departure Procedures:

Altimeter Settings

Setting Heading Procedures

Noting of ETA(s)

En-Route:

Map reading – identification of ground features

Maintenance of Altitudes and Headings

Revisions to ETA and Heading, wind effect, drift angle and groundspeed checks.

Log Keeping

Use of Radio (including VDF if applicable)

Minimum Weather Conditions for Continuance of Flight

'In Flight' Decisions, diversion procedures

Operations in Regulated/Controlled Airspace

Procedures for Entry, Transit and Departure

Navigation at Minimum Level

Uncertainty of Position Procedure Including R/T

Lost Procedure Procedure

Use of Radio Navaids

Arrival Procedures

Aerodrome Circuit Joining Procedures:

Altimeter Setting, ATC Liaison, R/T Procedure, etc.

Entering the Traffic Pattern (controlled/uncontrolled aerodromes)

Circuit Procedures

Parking Procedures

Security of Aeroplane Refuelling and Booking In

AIR EXERCISE 18A

PILOT NAVIGATION

Flight Planning:

Weather Forecast and Actual(s)

Map Selection and Preparation:

Choice of Route

Regulated/Controlled Airspace

Danger, Prohibited and Restricted Areas

Safety Altitude

Calculations:

Magnetic Heading(s) and Time(s) En-Route

Fuel Consumption

Mass and Balance

Mass and Performance

Flight Information:

NOTAMs etc.

Noting of Required Radio Frequencies

Selection of Alternate Aerodromes

Aeroplane Documentation

Notification of the Flight:

Flight clearance procedures (as applicable)

Flight Plans

AERODROME DEPARTURE

Organisation of Cockpit Workload

Departure Procedures:

Altimeter Settings

En-route:

Noting of ETA(s)

Wind effect, drift angle, ground speed checks

Maintenance of Altitudes and Headings

Revisions to ETA and Heading

Log Keeping

Use of Radio (including VDF if applicable)

Minimum Weather Conditions for Continuance of Flight

'In Flight' Decisions

Diversion Procedure

Operations in Regulated/Controlled Airspace

Procedures for Entry, Transit and Departure

Uncertainty of Position Procedure

Lost Procedure

Use of Radio Navaids

Arrival Procedures:

Aerodrome Joining Procedures:

Altimeter Setting, ATC Liaison, etc.

Entering the Traffic Pattern

Circuit Procedures

Parking Procedures

Security of Aircraft

Refuelling

Booking In

LONG BRIEFING EXERCISE 18B - NAVIGATION AT LOWER LEVELS/REDUCED VISIBILITY

OBJECTIVES:

General Considerations:

Planning Requirements Prior to Flight in Entry/Exit Lanes

ATC Rules, Pilot Qualifications and Aircraft Equipment

Entry/Exit Lanes and Areas where Specific Local Rules Apply

Low Level Familiarisation:

Actions Prior to Descending

Visual Impressions and Height Keeping at Low Altitude

Effects of Speed and Inertia During Turns

Effects of Wind and Turbulence

Low Level Operation:

Weather Considerations

Low Cloud and Good Visibility

Low Cloud and Poor Visibility

Avoidance of Moderate to Heavy Rain Showers

Effects of Precipitation

Joining a Circuit

Bad Weather Circuit, Approach and Landing

Airmanship

AIR EXERCISE 18B

NAVIGATION AT LOWER LEVELS

Low Level Familiarisation:

Entry/Exit Lanes and Areas Where Specific Local Rules Apply

Actions Prior to Descending

Visual Impressions and Height Keeping at Low Altitude

Effects of Speed and Inertia During Turns

Effects of Wind and Turbulence

Hazards of operating at low levels

Low Level Operation:

Weather Considerations

Low Cloud and Good Visibility

Low Cloud and Poor Visibility

Avoidance of Moderate to Heavy Rain Showers

Effects of Precipitation (forward visibility)

Joining a Circuit

Bad Weather Circuit, Approach and Landing

Airmanship

LONG BRIEFING EXERCISE 18C - USE OF RADIO NAVIGATION AIDS UNDER VFR

OBJECTIVES:

a. use of VHF omni range
   - availability of VOR stations, AIP
   - signal reception range
      - selection and identification
   - radials and method of numbering
   - use of omni bearing selector (OBS)
   - To–From indication and station passage
   - selection, interception and maintaining a radial
   - use of two stations to determine position

b. use of automatic direction finding equipment (ADF)
   - availability of NDB stations, AIP
   - signal reception range
      - selection and identification

- orientation in relation to NDB
- homing to an NDB

c. use of VHF direction finding (VHF/DF)
   - availability, AIP
   - R/T procedures
   - obtaining QDMs and QTEs

d. use of radar facilities
   - availability and provision of service, AIS
   - types of service
   - R/T procedures and use of transponder
     - mode selection
     - emergency codes

e. Use of Distance Measuring Equipment (DME)
   - availability, AIP
   - operating modes
   - slant range

f. Use of Aero Navigation systems, satellite navigation systems (RNAV – SATNAV)
   - availability
   - operating modes
   - limitations

AIR EXERCISE 18C

RADIO NAVIGATION

a. Use of VHF Omni Range
   - availability, AIP, frequencies
   - selection and identification
   - omni bearing selector (OBS)
   - to/from indications, – orientation
   - course deviation indicator (CDI)
   - determination of radial
   - intercepting and maintaining a radial
   - VOR passage
   - obtaining a fix from two VORs

b. Use of automatic direction finding equipment (ADF)

   non-directional beacons (NDBs)
   - availability, AIP, frequencies

- selection and identification
- orientation relative to the beacon
- homing

c. Use of VHF direction finding (VHF/DF)
- availability, AIP, frequencies
- R/T procedures and ATC liaison
- obtaining a QDM and homing

d. Use of en-route/terminal radar
- availability, AIP
- procedures and ATC liaison
- pilot’s responsibilities
- secondary surveillance radar
- transponders
- code selection
- interrogation and reply

e. Use of distance measuring equipment (DME)
- station selection and identification
- modes of operation

f. Use of Aero Navigation systems, satellite navigation systems (RNAV – SATNAV)
- setting up
- operation
- interpretation

LONG BRIEFING EXERCISE 19 – INTRODUCTION TO INSTRUMENT FLYING

OBJECTIVES:

Flight Instruments

Physiological Considerations

Instrument Appreciation

Attitude Instrument Flight

Pitch Indications

Bank Indications

Different Dial Presentations

Introduction to the Use of the Attitude Indicator

Pitch Attitude

Bank Attitude

Maintenance of Heading and Balanced flight
Instrument Limitations (inc. System Failures)
ATTITUDE, POWER & PERFORMANCE
Attitude Instrument Flight:
Control Instruments
Performance Instruments
Effect of Changing Power and configuration
Cross Checking the Instrument Indications
Instrument Interpretation
Direct and Indirect Indications (Performance Instruments)
Instrument Lag
Selective Radial Scan
THE BASIC FLIGHT MANOEUVRES (FULL PANEL)
Straight and Level Flight at Various Airspeeds and Aeroplane Configurations
Climbing
Descending
Standard Rate Turns

Level	)	
Climbing	)	Onto Pre-Selected Headings
Descending	)	

AIR EXERCISE 19
INTRODUCTION TO INSTRUMENT FLYING
Physiological Sensations
Instrument Appreciation
Attitude Instrument Flight
Pitch Attitude
Bank Attitude
Maintenance of Heading and Balanced Flight
Attitude Instrument Flight
Effect of Changing Power and configuration
Cross Checking the Instruments
Selective Radial Scan
THE BASIC FLIGHT MANOEUVRES (FULL PANEL)
Straight and Level Flight at various Airspeeds and Aeroplane Configurations
Climbing
Descending

Standard Rate Turns

Level	)	
Climbing	)	Onto Pre-Selected Headings
Descending	)	

LONG BRIEFING EXERCISE 20 - BASIC NIGHT FLYING

A summary of points to be covered before sending the student on a first solo at night

- Start up procedures
- Local procedures - including ATC liaison
- Taxiing
  - Parking area and taxiway lighting
  - Judgement of speed and distances
  - Use of taxiway lights
  - Avoidance of hazards – obstruction lighting
  - Instrument checks
- Holding point – lighting procedure
- Initial familiarisation at night
- Local area orientation
- Significance of lights on other aircraft
- Ground obstruction lights
- Division of piloting effort – external/instrument reference
- Rejoining procedure
- Aerodrome lighting – Approach and runway lighting (including VASI and PAPI)
  - Threshold lights
  - Approach lighting
  - Visual approach slope indicator systems
- NIGHT CIRCUITS
- Take-off and climb
  - Line up
  - Visual references during the take-off run
  - Transfer to instruments
  - Establishing the initial climb
  - Use of flight instruments
  - Instrument climb and initial turn
- The circuit

Aeroplane positioning – reference to runway lighting

The traffic pattern and lookout

Initial approach and runway lighting demonstration

Aeroplane positioning

Changing aspect of runway lights and VASI (or PAPI)

Intercepting the correct approach path

The climb away

Approach and landing

Positioning, base leg and final approach

Diurnal wind effect

Use of landing lights

The flare and touchdown

The roll out

Turning off the runway – control of speed

Missed approach

Use of instruments

Re-positioning in the circuit pattern

NIGHT NAVIGATION

Particular emphasis on flight planning

Selection of ground features visible at night

Air light beacons

Effect of cockpit lighting on map colours

Use of radio aids

Effect of moonlight upon visibility at night

Emphasis on maintaining a 'minimum safe altitude'

Alternate aerodromes – restricted availability

Restricted recognition of weather deterioration

Lost procedures

NIGHT EMERGENCIES

Radio failure

Failure of runway lighting

Failure of aeroplane landing lights

Failure of aeroplane internal lighting

Failure of aeroplane navigation lights

Total electrical failure

Abandoned take-off

Engine failure

Obstructed runway procedure

B. HELICOPTERS

PART 2

AIR EXERCISES

1. The air exercises are similar to those used for the training of PPL(H) but with additional items designed to cover the needs of a flight instructor.

2. The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide: therefore the demonstrations and practices need not necessarily be given in the order listed. The actual order and content will depend upon the following interrelated factors:

   The applicant's progress and ability

   The weather conditions affecting the flight

   The flight time available

   Instructional technique considerations

   The local operating environment

   Applicability of the exercises to the helicopter type

3. It follows that student instructors will eventually be faced with similar interrelated factors. They should be shown and taught how to construct flight lesson plans, taking these factors into account, so as to make the best use of each flight lesson, combining parts of the set exercises as necessary.

GENERAL

4. The briefing normally includes a statement of the objectives and a brief reference to principles of flight only if relevant. An explanation is to be given of exactly what air exercises are to be taught by the instructor and practised by the student during the flight. It should include how the flight will be conducted with regard to who is to fly the helicopter and what airmanship, weather and flight safety aspects currently apply. The nature of the lesson will govern the order in which the constituent parts are to be taught.

5. The four basic components of the briefing will be:

   ~~1~~**a** The aim

   ~~2~~**b** Principles of Flight (briefest reference only)

   ~~3~~**c** The Air Exercise(s) (what, and how and by whom)

   ~~4~~**d** Airmanship

PLANNING OF FLIGHT LESSONS

6. The preparation of lesson plans is an essential pre-requisite of good instruction and the student instructor is to be given supervised practice in the planning and practical application of flight lesson plans.

GENERAL CONSIDERATIONS

7. The student instructor should complete flight training in order to practise the principles of basic instruction at the PPL(H) level.

8. During this training, except when acting as a student pilot for mutual flights, the student instructor occupies the seat normally occupied by the Flight Instructor.

9. It is to be noted that airmanship is a vital ingredient of all flight operations. Therefore, in the following air exercises the relevant aspects of airmanship are to be stressed at the appropriate times during each flight.

10. If the privileges of the FI(H) certificate are to include instruction for night flying, exercise 28 should be undertaken either as a part of the course or subsequent to certificate issue.

FLIGHT INSTRUCTION SYLLABUS CONTENTS

LONG BRIEFINGS AND AIR EXERCISES

~~1 Familiarisation with the helicopter~~

~~2 Preparation before and action after flight~~

~~3 Air experience~~

~~4 Effects of controls~~

~~5 Power and attitude changes~~

~~6 Level flight, climbing and descending and turning~~

~~7 Auto-rotations~~

~~8 Hovering and hover taxying~~

~~9 Take-off and landing~~

~~10 Transitions from hover to climb and approach to hover~~

~~11 Circuits and emergencies~~

~~12 First solo~~

~~13 Sideways and backwards hover manoeuvring~~

~~14 Spot turns~~

~~15 Hover out of ground effect (OGE) and Vortex ring~~

~~16 Simulated engine off landings~~

~~17 Advanced auto-rotations~~

~~18 Practice forced landings~~

~~19 Steep turns~~

~~20 Transitions~~

~~21 Quick-stops~~

~~22 Navigation~~

~~23 Advanced take-offs, landings and transitions~~

~~24 Sloping ground~~

~~25 Limited power~~

~~26 Confined areas~~

~~27 Basic instrument flying~~

~~28 Night flying (if night instructional qualification required)~~

NOTE: Airmanship should be included as required in each exercise.

EXERCISE 1 - FAMILIARISATION WITH THE HELICOPTER

LONG BRIEFING

OBJECTIVES:

to familiarise the student with the helicopter

to explain thecharacteristics of the helicopter

the cockpit layout

the helicopter and engine systems

the use of the check list(s) and procedures

to familiarise the student with the helicopter controls

to explain the differences when occupying the instructor's seat

EMERGENCY DRILLS

to explain the action in the event of a fire on the ground or in the air:

engine fire

cockpit/cabin fire

electrical fire

system failure drills as applicable to type

escape exits

to demonstrate escape drills including use of Emergency equipment

EXERCISE 2 - PREPARATION FOR AND ACTION AFTER FLIGHT

LONG BRIEFING

OBJECTIVES:

to explain flight authorisation and helicopter acceptance including tech log (if applicable) and certificate of maintenance

equipment required for flight (maps, etc.)

external checks

internal checks

harness, seat and rudder pedal adjustment, (student comfort)

to demonstrate starting and after starting checks system/power/serviceability checks (as applicable)

closing down/shutting down the helicopter (including system checks)

to explain parking, leaving the helicopter (including safety/security as applicable)

completion of the authorisation sheet and helicopter serviceability documents

EXERCISE 3 - AIR EXPERIENCE

Note: there is no requirement for a long briefing for this exercise

AIR EXERCISE

Objectives

to give the student air experience

to familiarise the student with the cockpit layout, ergonomics, controls

to demonstrate cockpit procedures

stability and control

EXERCISE 4 - EFFECTS OF CONTROLS

LONG BRIEFING

OBJECTIVES:

to explain the function of the flying controls (primary and secondary effect)

the effect of airspeed

the effect of power changes (torque)

the effect of yaw (sideslip)

the effect of disc loading (bank and flare)

the effect on controls of selecting hydraulics on/off

the effect of control friction

the instruments

the use of carburettor heat/anti-icing control

AIR EXERCISE

OBJECTIVES:

to demonstrate the function of the flying controls

the effects of airspeed

the effect of power changes (torque)

the effect of yaw (sideslip)

the effect of disc loading (bank and flare)

the effect on controls of selecting hydraulics on/off

the effect of control friction

the instruments (including instrument scan)

the use of carburettor heat/anti-icing control

EXERCISE 5 - POWER AND ATTITUDE CHANGES

LONG BRIEFING

OBJECTIVES:

to explain the relationship between cyclic control position, disc attitude, fuselage attitude and airspeed flapback

the power required diagram in relation to airspeed

power and airspeed changes in level flight

the use of the instruments for precision

the engine and airspeed limitations

AIR EXERCISE

OBJECTIVES:

to demonstrate the relationship between cyclic control position, disc attitude, fuselage attitude and airspeed flapback

power and airspeed changes in level flight

the use of instruments for precision (including instrument scan and lookout)

EXERCISE 6 - LEVEL FLIGHT, CLIMBING, DESCENDING AND TURNING

NOTE: For ease of training this exercise is divided into four separate parts in the PPL(H) syllabus but may be taught complete or in convenient parts

LONG BRIEFING

OBJECTIVES:

to explain the basic factors involved in level flight

the normal power settings

the use of control friction and/or trim

the importance of maintaining direction and balance

the power required/power available diagram

the optimum climb and descent speeds/angles/rates

the importance of balance, attitude and co-ordination in the turn

the effects of turning on rate of climb/descent

the use of the gyro direction/heading indicator and compass

the use of instruments for precision

AIR EXERCISE

OBJECTIVES:

to demonstrate maintaining straight and level flight at normal cruise power

control in pitch, including use of control friction and/or trim

the use of the ball/yawstring to maintain direction and balance

setting and use of power for selected airspeeds/speed changes

entry to climb

normal and maximum rate of climb

levelling off from climb at selected altitudes/heights

entry to descent

effect of power and airspeed on rate of descent

levelling off from descent at selected altitudes/heights

entry to medium rate turns

importance of balance, attitude and co-ordination to maintain level turn

resuming straight and level flight

turns onto selected headings, use of direction indicator and compass

turns whilst climbing and descending

effect of turn on rate of climb or descent

the use of instruments for precision (including instrument scan and lookout)

EXERCISE 7 - AUTOROTATION

LONG BRIEFING

OBJECTIVES:

to explain the characteristics of autorotation

safety checks (including lookout and verbal warning)

entry and development of autorotation

the effect of AUM, IAS, disc loading, G forces and density altitude on RRPM and rate of descent

rotor and engine limitations

control of airspeed and RRPM

recovery to powered flight

throttle override and control of ERPM/RRPM during re-engagement (as applicable)

danger of vortex condition during recovery

AIR EXERCISE

Objectives

to demonstrate safety checks (including verbal warning and lookout)

entry to and establishing in autorotation
effect of IAS and disc loading on RRPM and rate of descent
control of airspeed and RRPM
recovery to powered flight
medium turns in autorotation
a simulated engine off landing (as appropriate)

EXERCISE 8 - HOVERING AND HOVER TAXIING

LONG BRIEFING

OBJECTIVES:

to explain ground effect and power required
effect of wind, attitude and surface
stability in hover and effects of over controlling
effects of controls in hover
control and co-ordination during spot turns
requirement for slow hover speed to maintain ground effect
effect of hydraulic failure in hover
specific hazards, e.g. snow, dust, etc.

AIR EXERCISE

OBJECTIVES:

to demonstrate ground effect and power/height relationship
effect of wind, attitude and surface
stability in hover and effects of over controlling
effects of controls and hover technique
gentle forward running touchdown
control and co-ordination during spot (90 degree clearing) turns
control and co-ordination during hover taxi
dangers of mishandling and overpitching
(where applicable) effect of hydraulics failure in hover
simulated engine failure in the hover and hover taxi

EXERCISE 9 - TAKE-OFF AND LANDING

LONG BRIEFING

OBJECTIVES:

to explain pre-take-off checks/drills
importance of good lookout

technique for lifting to hover

after take-off checks

danger of horizontal movement near ground

dangers of mishandling and overpitching

technique for landing

after landing checks

take-off and landing cross wind and downwind

AIR EXERCISE

OBJECTIVES:

to demonstrate pre-take-off checks/drills

pre-take-off lookout technique

lifting to hover

after take-off checks

landing

after landing checks/drills

take-off and landing cross wind and downwind

EXERCISE 10 - TRANSITIONS FROM HOVER TO CLIMB AND APPROACH TO HOVER

LONG BRIEFING

OBJECTIVES:

to revise ground effect

to explain translational lift and its effects

inflow roll and its effects

to revise flapback and its effects

to explain avoid curve diagram and associated dangers

effect/dangers of wind speed/direction during transitions

transition to climb technique

constant angle approach

transition to hover technique

AIR EXERCISE

OBJECTIVES:

to revise take-off and landing

to demonstrate transition from hover to climb

effects of translational lift, inflow roll and flapback

constant angle approach

technique for transition from descent to hover

a variable flare simulated engine off landing

EXERCISE 11 - CIRCUIT, APPROACH AND LANDING

LONG BRIEFING

OBJECTIVES:

to explain circuit and associated procedures

take-off and climb (including checks/speeds)

cross wind leg (including checks/speeds/angles of bank in turns)

downwind leg (including pre-landing checks)

base leg (including checks/speeds/angles of bank in turns)

final approach (including checks/speeds)

effect of wind on approach and hover IGE

cross wind approach and landing technique

missed approach and go around technique (as applicable)

steep approach technique (including danger of high sink rate)

limited power approach technique (including danger of high speed at touch down)

use of the ground effect

abandoned take-off technique

hydraulic failure drills and hydraulics off landing technique (where applicable)

drills/technique for tail rotor control/tail rotor drive failure

engine failure drills in the circuit to include

engine failure on take-off

cross wind

downwind

base leg

on final approach

noise abatement procedures (as applicable)

AIR EXERCISE

OBJECTIVES:

to revise transitions and constant angle approach

to demonstrate a basic training circuit, including checks

cross wind approach and landing technique

missed approach and go around technique (as applicable)

steep approach technique

basic limited power approach/run on technique

use of ground effect

hydraulic failure and approach to touchdown with hydraulics off

and to recover at safe height (as applicable)

simulated engine failure on take-off, cross wind, downwind, base leg and finals

variable flare simulated engine off landing

EXERCISE 12 - FIRST SOLO

INSTRUCTORS BRIEF TO STUDENT TO INCLUDE:

warning of change of attitude due to reduced and laterally displaced weight

low tail, low skid/wheel during hover/landing

dangers of loss of RRPM and overpitching

pre-take-off checks

into wind take-off

drills during and after take-off

normal circuit, approach and landing

action in the event of an emergency

EXERCISE 13 - SIDEWAYS AND BACKWARDS HOVER MANOEUVRING

LONG BRIEFING

OBJECTIVES:

to revise hovering

to explain directional stability and weathercocking effect

danger of pitching nose down on recovery from backwards manoeuvring

helicopter limitations for sideways and backwards manoeuvring

effect of C of G position

AIR EXERCISE

OBJECTIVES:

to revise hovering and 90 degree clearing turns

to demonstrate manoeuvring sideways heading into wind

manoeuvring backwards heading into wind

manoeuvring sideways and backwards heading out of wind

manoeuvring backwards too fast and recovery action

EXERCISE 14 - SPOT TURNS

LONG BRIEFING

OBJECTIVES:

to revise ground effect and effect of wind

to explain weathercocking and control actions

control of RRPM

torque effect

cyclic limiting stops due to C of G position (where applicable)

rate of turn limitations

spot turn about pilot position

spot turn about tail rotor position

spot turn about helicopter geometric centre

square (safe visibility) clearing turn

AIR EXERCISE

OBJECTIVES:

to demonstrate weathercocking, torque effect and control actions

rate of turn

spot turn about pilot position

spot turn about tail rotor position

spot turn about helicopter geometric centre

square, clearing turn

EXERCISE 15 - HOVER OUT OF GROUND EFFECT AND VORTEX RING

LONG BRIEFING

OBJECTIVES:

to revise ground effect and power required diagram

to explain drift/height/power control/lookout/scan

vortex ring, (including dangers, recognition and recovery actions)

loss of tail rotor effectiveness

AIR EXERCISE

OBJECTIVES:

to demonstrate hover OGE

drift/height/power control/lookout and instrument scan technique

recognition of incipient stage of vortex ring/settling with power

recovery action from incipient stage of vortex ring

recognition of loss of tail rotor effectiveness and recovery actions

EXERCISE 16 - SIMULATED ENGINE OFF LANDINGS

LONG BRIEFING

OBJECTIVES:

to revise	basic autorotation
	effect of AUM, disc loading, density altitude and RRPM decay
	use of cyclic and collective to control speed/RRPM
	torque effect
to explain	use of flare/turn to restore RRPM
	technique for variable flare simulated EOL
	technique for constant attitude simulated EOL
to revise	technique for hover/hover taxi simulated EOL
to explain	emergency technique for engine failure during transition
	technique for low level simulated EOL

AIR EXERCISE

OBJECTIVES:

to revise	entry to and control in autorotation
to demonstrate	variable flare simulated EOL
	constant attitude simulated EOL
	hover simulated EOL
	hover taxi simulated EOL
	low level simulated EOL

EXERCISE 17 - ADVANCED AUTOROTATIONS

LONG BRIEFING

OBJECTIVES:

to explain	effect of airspeed/AUM on angles/rates of descent
	effect of RRPM setting on angle/rate of descent
	reason and technique for range autorotation
	reason and technique for constant attitude autorotation
	reason and technique for low speed and 'S' turns in autorotation
	speed/bank limitations in turns in autorotation
to revise	re-engagement/go-around procedures

AIR EXERCISE

OBJECTIVES:

to select	ground marker and standard datum height to determine distance covered during various autorotation techniques

to revise basic autorotation

to demonstrate technique for range autorotation

technique for constant attitude autorotation

technique for low speed autorotation, including need for timely speed recovery

technique for ‘S’ turn in autorotation

180 and 360 degree turns in autorotation

to revise re-engagement and go-around technique

EXERCISE 18 - PRACTICE FORCED LANDINGS

LONG BRIEFING

OBJECTIVES:

to explain types of terrain/surface options for choice of best landing area

practice forced landing procedure

forced landing checks and crash actions

rules/height for recovery and go-around

AIR EXERCISE

OBJECTIVES:

to demonstrate recognition of types of terrain from normal cruise height/altitude

practice forced landing technique

to revise recovery/go-around technique

EXERCISE 19 - STEEP TURNS

LONG BRIEFING

OBJECTIVES:

to explain airspeed/angle of bank limitations

technique for co-ordination to hold bank/attitude

to revise speed/bank limitations in autorotation including RRPM control

to explain significance of disc loading, vibration and control feedback

effect of wind in turns at low level

AIR EXERCISE

OBJECTIVES:

to demonstrate technique for turning at 30 degrees of bank

technique for turning at 45 degrees of bank (where possible)

steep autorotative turns

to explain faults in the turn - balance, attitude, bank and co-ordination to demonstrate effect of wind at low level

EXERCISE 20 - TRANSITIONS

LONG BRIEFING

OBJECTIVES:

to revise effect of ground cushion, translational lift, flapback

to explain training requirement for precision exercise

technique for transition to forward flight and back to hover as precision exercise

effect of wind

AIR EXERCISE

OBJECTIVES:

to demonstrate transition from hover to minimum 50 knots IAS and back to hover

NOTE: select constant height (20 - 30 feet) and maintain

to demonstrate effect of wind

EXERCISE 21 - QUICKSTOPS

LONG BRIEFING

OBJECTIVES:

to explain power control co-ordination

to revise effect of wind

to explain technique for quickstop into wind

technique for quickstop from cross wind

to revise airspeed/angles of bank limitations

to explain technique for Emergency turn from downwind

technique for quickstop from downwind from high speed - flare and turn

technique for quickstop from downwind from low speed - turn and flare

NOTE: use reasonable datum speed e.g. high speed, low speed

to explain danger of holding flare when downwind, (vortex ring) - (minimum speed 70 knots)

to revise danger of high disc loading

AIR EXERCISE

OBJECTIVES:

to demonstrate technique for quickstop into wind

technique for quickstop from cross wind

danger of vortex ring and disc loading

technique for quickstop from downwind with low speed

technique for quickstop from downwind with high speed

Emergency turns from downwind

EXERCISE 22 - NAVIGATION

LONG BRIEFING - to be broken down into manageable parts at discretion of instructor

OBJECTIVES:

flight planning

to explain use of weather forecasts/actuals

map selection, orientation, preparation and use

route choice with particular regard to:

controlled airspace, danger and prohibited areas

safety altitudes

calculations with particular regard to:

magnetic heading(s), time(s) en route

fuel consumption

mass and balance

use of flight information with particular regard to:

NOTAM's

radio frequencies

selection of alternate landing sites

to revise and explain helicopter documentation

to explain notification of the flight, to include

pre-flight administration procedures

flight plan form (where appropriate)

departure

to explain importance of organisation of cockpit workload

departure procedures to include

altimeter settings

ATC liaison in controlled/regulated airspace

setting heading procedure

noting of ETA's

maintenance of height/altitude and heading

procedure for revisions of ETA and headings to include

10 degree line, double track, track error, closing angle

1 in 60 rule

amending an ETA

log keeping

use of radio

use of navaids

weather monitoring and minimum weather conditions for continuation of flight

significance of in flight decision making

technique for transiting controlled/regulated airspace

uncertainty of position procedure

lost procedure

arrival

to explain aerodrome joining procedure, in particular

ATC liaison in controlled/regulated airspace

altimeter setting

entering traffic pattern

circuit procedures

parking procedures, in particular

security of helicopter

refuelling

closing of flight plan, (if appropriate)

post flight administrative procedures

navigation problems at low heights and reduced visibility

to explain actions prior to descending

significance of hazards, (e.g. obstacles, other traffic)

difficulties of map reading

effects of wind and turbulence

significance of avoiding noise sensitive areas

procedures for joining a circuit from low level

procedures for a bad weather circuit and landing

appropriate procedures and choice of landing area for precautionary landings

radio navigation

to explain use of VHF Omni Range, including:

availability, AIP, frequencies

selection and identification

omni bearing selector (OBS)
to/from indications, orientation
course deviation indicator (CDI)
determination of radial
intercepting and maintaining a radial
VOR passage
obtaining a fix from two VORs

use of automatic direction finding equipment (ADF)/ non-directional beacons (NDBs), including:
availability, AIP, frequencies
selection and identification
orientation relative to beacon
homing

use of VHF direction finding (VHF/DF)
availability, AIP, frequencies
R/T procedures and ATC liaison
obtaining a QDM and homing

use of en-route/terminal radar, including:
availability, AIP
procedures and ATC liaison
pilots responsibilities
secondary surveillance radar, including:
transponders
code selection
interrogation and reply

use of distance measuring equipment (DME), including:
station selection and identification
modes of operation, including:
distance, groundspeed, time to run

AIR EXERCISE

OBJECTIVES:

to demonstrate navigation procedures as necessary
to advise student and correct errors as necessary
to demonstrate map reading techniques
the significance of calculations
revision of headings and ETA's

use of radio

use of navaids, including ADF/NDB, VOR, VHF/DF, DME, Transponder

log keeping

importance of decision making

procedure to deal with uncertainty of position

lost procedure

appropriate procedures and choice of landing area for precautionary landings

aerodrome joining procedure

parking and shut-down procedures

post-flight administration procedures

EXERCISE 23 - ADVANCED TAKE-OFF, LANDINGS, TRANSITIONS

LONG BRIEFING

OBJECTIVES:

to revise landing and takeoff out of wind (performance reduction)

wind limitations

directional stability variation when out of wind

power required diagram

to explain technique for downwind transitions

technique for vertical take-off over obstacles

reconnaissance technique for landing site

power checks

technique for running landing

technique for zero speed landing

technique for cross wind and downwind landings

steep approach, including dangers

to revise go around procedures

AIR EXERCISE

OBJECTIVES:

to demonstrate technique for downwind transition

technique for vertical take-off over obstacles

reconnaissance technique for landing site

power check and assessment

technique for running landing

technique for zero speed landing

technique for cross wind and downwind landings

technique for steep approach

go around procedures

EXERCISE 24 - SLOPING GROUND

LONG BRIEFING

OBJECTIVES:

to explain limitations

wind and slope relationship, including blade and control stops

the effect of C of G when on slope

ground effect and power required when on slope

landing technique when on slope, left, right and nose-up

avoidance of dynamic rollover, dangers of soft ground and sideways movement

dangers of overcontrolling near ground on slope

danger of striking main/tail rotor on up slope

AIR EXERCISE

OBJECTIVES:

to demonstrate technique for assessing slope angle

technique for landing/take-off left skid up slope

technique for landing/take-off right skid up slope

technique for landing nose up slope

dangers of overcontrolling near ground

EXERCISE 25 - LIMITED POWER

LONG BRIEFING

OBJECTIVES:

to explain use of appropriate helicopter performance graphs

selection of technique according to available power

effect of wind on available power

AIR EXERCISE

OBJECTIVES:

to revise and refine techniques demonstrated in Exercise 23

EXERCISE 26 - CONFINED AREAS

LONG BRIEFING

OBJECTIVES:

to revise use of helicopter performance graphs

to explain procedure for locating landing site and selecting site marker

procedures for assessing wind speed/direction

landing site reconnaissance techniques

reason for selecting landing markers

procedure for selecting direction and type of approach

dangers of out of wind approach

circuit procedures

reason for approach to committal point and go around, (practice approach)

approach technique

to revise clearing turn and landing, (sloping ground technique)

to explain hover power check/performance assessment IGE and OGE, (if necessary)

take-off procedures

AIR EXERCISE

OBJECTIVES:

to demonstrate procedure for locating landing site and selecting site marker

procedure for assessing wind speed/direction

landing site reconnaissance techniques

selecting landing markers, direction and type of approach

circuit procedure

practice approach, go around and approach technique

to revise clearing turn and landing, (sloping ground technique)

to demonstrate hover power check/performance assessment IGE and OGE, (if necessary)

take-off procedures

EXERCISE 27 - BASIC INSTRUMENT FLIGHT

LONG BRIEFING

OBJECTIVES:

to explain physiological sensations

instrument appreciation

attitude instrument flight

instrument scan

instrument limitations

basic manoeuvres by sole reference to instruments, including:

straight and level flight at various airspeeds and configurations

climbing and descending

standard rate turns, climbing and descending , onto selected headings

recoveries from climbing and descending turns (unusual attitudes)

AIR EXERCISE

OBJECTIVES:

to demonstrate attitude instrument flight and instrument scan

basic manoeuvres by sole reference to instruments, including:

straight and level flight at various airspeeds and configurations

climbing and descending

standard rate turns, climbing and descending, onto selected headings

recoveries from climbing and descending turns (unusual attitudes)

EXERCISE 28 - NIGHT FLYING (if night instructional qualification required)

LONG BRIEFING

OBJECTIVES:

to explain medical/physiological aspects of night vision

requirement for torch to be carried, (pre-flight inspection, etc.)

use of the landing light

take-off and hover taxi procedures at night

night take-off procedure

cockpit procedures at night

approach techniques

night landing techniques

night autorotation techniques (power recovery at safe height)

technique for practice forced landing at night (using appropriate illumination)

Emergency procedures at night

navigation principles at night

map marking for night use, (highlighting built up/lit areas with thicker lines, etc.)

AIR EXERCISE

OBJECTIVES:

to demonstrate use of torch for pre-flight inspection use of landing light

night take-off to hover, (no sideways or backwards movement)

night hover taxi, (higher and slower than by day)

night transition procedure

night circuit

night approach and landing, (including use of landing light)

night autorotation (power recovery at safe height)

practice forced landing at night, (using appropriate illumination)

night Emergency procedures

night cross country techniques, as appropriate

C. AIRSHIPS

Part 2

AIR EXERCISES

1. The air exercises are similar to those used for the training of PPL(As) but with additional items designed to cover the needs of a flight instructor.

2. The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide: therefore the demonstrations and practices need not necessarily be given in the order listed. The actual order and content will depend upon the following interrelated factors:

   The applicant's progress and ability

   The weather conditions affecting the flight

   The flight time available

   Instructional technique considerations

   The local operating environment

3. It follows that student instructors will eventually be faced with similar interrelated factors. They should be shown and taught how to construct flight lesson plans, taking these factors into account, so as to make the best use of each flight lesson, combining parts of the set exercises as necessary.

GENERAL

4. The briefing normally includes a statement of the aim and a brief allusion to principles of flight only if relevant. An explanation is to be given of exactly what air exercises are to be taught by the instructor and practised by the student during the flight. It should include how the flight will be conducted with regard to who is to fly the airship and what airmanship, weather and flight safety aspects currently apply. The nature of the lesson will govern the order in which the constituent parts are to be taught.

5. The four basic components of the briefing will be:

   ~~1~~**a** The aim

~~2~~**b** Principles of Flight (briefest reference only)

~~3~~**c** The Air Exercise(s) (what, and how and by whom)

~~4~~**d** Airmanship (weather, flight safety etc.)

PLANNING OF FLIGHT LESSONS

6**.** The preparation of lesson plans is an essential pre-requisite of good instruction and the student instructor is to be given supervised practice in the planning and practical application of flight lesson plans.

GENERAL CONSIDERATIONS

7**.** The student instructor should complete flight training to practise the principles of basic instruction at the PPL(As) level.

8**.** During this training, except when acting as a student pilot for mutual flights, the student instructor occupies the seat normally occupied by the FI(As).

9 It is to be noted that airmanship is a vital ingredient of all flight operations. Therefore, in the following air exercises the relevant aspects of airmanship are to be stressed at the appropriate times during each flight.

10**.** The exercises 15 and 16 of the flight instruction syllabus should be undertaken at night in addition to by day as part of the course.

FLIGHT INSTRUCTION SYLLABUS CONTENTS

LONG BRIEFINGS AND AIR EXERCISES

~~1 Familiarisation with the airship~~

~~1E Emergency drills~~

~~2 Preparation before and action after flight~~

~~3 Air experience~~

~~4 Effects of controls~~

~~5 Ground manoeuvring~~

~~6 Take off procedures~~

~~6E Emergencies~~

~~7 Climbing~~

~~8 Straight and level flight~~

~~9 Descending~~

~~10 Turning~~

~~11 Hovering~~

~~12 Approach and landing~~

~~12E Emergencies~~

~~13 Precautionary landing~~

~~14A Navigation~~

~~14B Navigation problems at lower levels / reduced visibility~~

~~14C Radio navigation~~

~~15 Basic **i**Instrument **f**Flight~~

~~16 Basic night flight~~

NOTE: Although exercise 16 is not required for the PPL(As) course it is a requirement for the FI(As) course.

~~FLIGHT INSTRUCTION SYLLABUS CONTENTS~~

~~**LONG BRIEFINGS AND AIR EXERCISES**~~

EXERCISE 1 - FAMILIARISATION WITH THE AIRSHIP

LONG BRIEFING

OBJECTIVES:

to familiarise the student with the airship

to explain thecharacteristics of the airship

the cockpit layout

the airship and engine systems

the use of the check list(s) and procedures

to familiarise the student with the airship controls

to explain the differences when occupying the instructor's seat

EMERGENCY DRILLS

to explain the action in the event of a fire on the ground or in the air:

engine fire

cockpit/cabin fire

electrical fire

system failure drills as applicable to type

escape exits

to demonstrate escape drills including use of Emergency equipment

EXERCISE 2 - PREPARATION FOR AND ACTION AFTER FLIGHT

LONG BRIEFING

OBJECTIVES:

to explain flight authorisation and airship acceptance including tech log (if applicable) and certificate of maintenance

equipment required for flight (maps, etc.)

external checks

internal checks

harness, seat and rudder pedal adjustment, (student comfort) to demonstrate starting and after starting checks

system/power/serviceability checks (as applicable)

closing down/shutting down the airship (including system checks)

to explain parking, masting/unmasting, leaving the airship (including safety/security as applicable)

completion of the authorisation sheet and airship serviceability documents

to advise student and correct errors as necessary

EXERCISE 3 - AIR EXPERIENCE

NOTE: there is no requirement for a long briefing for this exercise

AIR EXERCISE

OBJECTIVES:

to give the student air experience

to familiarise the student with the cockpit layout, ergonomics, controls

to demonstrate cockpit procedures

EXERCISE 4 - EFFECTS OF CONTROLS

LONG BRIEFING

OBJECTIVES:

to explain the function of the flying controls (primary and secondary effect)

the effect of airspeed

the effect of power changes

the effect of trimming and other controls

the instruments

the use of carburettor heat

AIR EXERCISE

OBJECTIVES:

to demonstrate the function of the flying controls

the effects of airspeed

the effect of power changes

the effect of trimming and other controls

the instruments (including instrument scan)

the use of carburettor heat

to advise student and correct errors as necessary

EXERCISE 5 – GROUND MANOUEVERING

LONG BRIEFING

OBJECTIVES:

to explain the pre-taxi checks
starting, control of speed and stopping
engine handling
masting procedures
control of direction and turning
effects of wind
effects of ground surface
marshalling signals
instrument checks
air traffic control procedures
emergencies

AIR EXERCISE

OBJECTIVES:

to demonstrate starting, control of speed and stopping
engine handling
masting procedures
control of direction and turning
effects of wind

to advise student and correct errors as necessary

EXERCISE 6 – TAKE OFF PROCEDURES

LONG BRIEFING

OBJECTIVES:

to explain pre take off checks
take off with different static heaviness
drills during and after take-off
noise abatement procedures

AIR EXERCISE

OBJECTIVES:

to demonstrate take off with different static heaviness
drills during and after take-off

to advise student and correct errors as necessary

EXERCISE 6E – EMERGENCIES

LONG BRIEFING

OBJECTIVES:

to explain the abandoned take-off
engine failures and actions after take-off
malfunctions of thrust vector control
aerodynamic control failures
electrical and system failures

AIR EXERCISE

OBJECTIVES:

to demonstrate how to abandon a take-ff
an engine failure and suitable action
malfunctions of thrust vector control
aerodynamic control failures

to advise student and correct errors as necessary

EXERCISE 7 – CLIMBING

LONG BRIEFING

OBJECTIVES:

to explain the entry and how to maintain the normal and max rate of climb
the levelling off procedure
how to level off at selected altitudes
the maximum angle of climb
the maximum rate of climb

AIR EXERCISE

Objectives

to demonstrate how to level off at selected altitudes
the maximum angle of climb
~~the maximum rate of climb~~

to advise student and correct errors as necessary

EXERCISE 8 – STRAIGHT AND LEVEL FLIGHT

LONG BRIEFING

OBJECTIVES:

to explain how to attain and maintain straight and level flight

flight at or close to pressure height

the control in pitch, including use of trim

at selected airspeeds (use of power)

during speed changes

the use of instruments for precision

AIR EXERCISE

OBJECTIVES:

to demonstrate how to attain and maintain straight and level flight

a flight at or close to pressure height

the control in pitch, including use of trim

at selected airspeeds (use of power)

during speed changes

to advise student and correct errors as necessary

EXERCISE 9 –– DESCENDING

LONG BRIEFING

OBJECTIVES:

to explain entry, maintaining and levelling off techniques

levelling off at selected altitudes

maximum rate of descent

maximum angle of descent

the use of instruments for precision flight

AIR EXERCISE

OBJECTIVES:

to demonstrate levelling off at selected altitudes

maximum rate of descent

maximum angle of descent

to advise student and correct errors as necessary

EXERCISE 10 –– TURNING

LONG BRIEFING

OBJECTIVES:

to explain the entry and maintaining level turns

resuming straight flight

faults in the turn

climbing turns

descending turns

turns onto selected headings, use of gyro heading indicator and compass

use of instruments for precision

AIR EXERCISE

OBJECTIVES:

to demonstrate the faults in the turn and correction techniques

climbing turns

descending turns

to advise student and correct errors as necessary

EXERCISE 11 –– HOVERING

LONG BRIEFING

OBJECTIVES:

to explain hovering manoeuvres (as applicable)

AIR EXERCISE

OBJECTIVES:

to demonstrate hovering manoeuvres (as applicable)

to advise student and correct errors as necessary

EXERCISE 12 – APPROACH AND LANDING

LONG BRIEFING

OBJECTIVES:

to explain the effect of wind on approach and touchdown speeds

landing with different static heaviness

missed approach/go around procedures

noise abatement procedures

AIR EXERCISE

OBJECTIVES:

to demonstrate a landing with different static heaviness missed approach/go around procedures

to advise student and correct errors as necessary

EXERCISE 12E – EMERGENCIES

OBJECTIVES:

to explain the action in the event of:

an aborted approach / go around

a malfunction of thrust vector control

envelope emergencies

fire emergencies

aerodynamic control failures

electrical and system failures

to demonstrate emergency drills and actions

to advise student and correct errors as necessary

EXERCISE 13 – PRECAUTIONARY LANDING

LONG BRIEFING

OBJECTIVES:

to explain occasions necessitating a precautionary landing

in-flight conditions

landing area selection

circuit and approach

AIR EXERCISE

OBJECTIVES:

to demonstrate how to perform the landing area selection

circuit and approach

to advise student and correct errors as necessary

EXERCISE 14 A - NAVIGATION

LONG BRIEFING

OBJECTIVES:

to explain how to do the flight planning

the departure for a navigation flight

in flight navigational techniques

the arrival and aerodrome joining procedures

AIR EXERCISE

OBJECTIVES:

to demonstrate the complete flight planning of a navigation flight

the departure for a navigation flight

in flight navigational techniques

the arrival and aerodrome joining procedures

to advise student and correct errors as necessary

EXERCISE 14B – NAVIGATION PROBLEMS AT LOWER LEVELS AND IN REDUCED VISIBILITY

LONG BRIEFING

OBJECTIVES:

to explain actions prior to descending

possible hazards (e.g. obstacles, and terrain) and actions

student difficulties of map reading

effects of winds, turbulence and precipitation

vertical situational awareness

avoidance of noise sensitive areas

joining the circuit

bad weather circuit and landing

AIR EXERCISE

OBJECTIVES:

to demonstrate actions prior to descending

map reading techniques

vertical situational awareness

avoidance of noise sensitive areas

joining the circuit

bad weather circuit and landing

to advise student and correct errors as necessary

EXERCISE 14C – RADIO NAVIGATION

LONG BRIEFING

OBJECTIVES:

to explain the use of VHF Omni Range

the use of automatic direction finding equipment (ADF)

the use of non-directional beacons (NDBs)

the use of VHF direction finding (VHF/DF)

the use of en-route/terminal radar

the use of distance measuring equipment (DME)

AIR EXERCISE

OBJECTIVES:

to demonstrate the use of navaids

procedure to deal with uncertainty of position

to advise student and correct errors as necessary

EXERCISE 15 – BASIC INSTRUMENT FLIGHT

LONG BRIEFING

OBJECTIVES:

to explain physiological sensations

instrument appreciation

attitude instrument flight

instrument scan

instrument limitations

the basic manoeuvres by sole reference to the instruments:

straight and level

climbing and descending

turns, climbing and descending, onto selected headings

recoveries from climbing and descending turns

AIR EXERCISE

OBJECTIVES:

to demonstrate attitude instrument flight and instrument scan

the basic manoeuvres:

straight and level

climbing and descending

turns, climbing and descending, onto selected headings

recoveries from climbing and descending turns

to advise student and correct errors as necessary

EXERCISE 16 - NIGHT FLYING (if night instructional qualification required)

LONG BRIEFING

OBJECTIVES:

to explain medical/physiological aspects of night vision

requirement for torch to be carried, (pre-flight inspection, etc.)

use of the landing light

ground manoeuvring procedures at night

night take-off procedure

cockpit procedures at night

approach techniques

night landing techniques

Emergency procedures at night

navigation principles at night

AIR EXERCISE

OBJECTIVES:

to demonstrate use of landing light

night ground manoeuvring

night take-off / circuit / approach and landing (including use of landing light)

to advise student and correct errors as necessary

D. ~~Sailplanes~~SAILPLANES

For the FI certificate (sailplanes) training course the AMC **No 1** to FCL.930**.**LAFI may be used.

E. ~~Balloons~~BALLOONS

For the FI certificate (balloons) training course the AMC **No 1** to FCL.930**.**LAFI may be used**.**

AMC No 1 to FCL.940.FI(a)(2)

Flight Instructor (FI)/Instrument Rating Instructor (IRI) refresher seminar

1. FI/IRI refresher seminars made available in **M**~~m~~ember States should have due regard to geographical location, numbers attending, and periodicity throughout the State concerned.
2. Such seminars should run for at least two days, and attendance from participants will be required for the whole duration of the seminar including breakout groups/workshops. Different aspects, such as inclusion of participants holding certificates in other categories of aircraft should be considered.
3. Some experienced FIs/IRIs currently involved with flying training and with a practical understanding of the revalidation requirements and current instructional techniques should be included as speakers at these seminars.
4. The attendance form will be completed and signed by the organiser of the seminar as approved by the Authority, following attendance and satisfactory participation by the FI/IRI.
5. The content of the FI/IRI refresher seminar should be selected from the following:
    a. new and/or current rules/regulations, with emphasis on knowledge of Part-FCL and Part-OPS requirements;
    b. teaching and learning;
    c. instructional techniques;
    d. the role of the instructor;
    e. national regulations (as applicable);
    f. human factors;
    g. flight safety, incident and accident prevention;
    h. airmanship;
    i. legal aspects and enforcement procedures;
    j. navigational skills including new/current radio navigation aids;
    k. teaching instrument flying; and
    l. weather related topics including methods of distribution.
    m. any additional topic selected by the Authority.
6. Formal sessions should allow for a presentation time of 45 minutes, with 15 minutes for questions. The use of visual aids is recommended, with interactive video and other teaching aids (where available) for breakout groups/workshops.

GM No 1 to FCL.940.FI(a)(2) and to FCL.940.LAFI

Flight instructor and Light Aircraft Flight Instructor certificate – Revalidation and renewal form

A. AEROPLANES

INSTRUCTIONAL FLYING EXPERIENCE				
Instructors applying for revalidation of the Flight Instructor Certificate / Light Aircraft Flight Instructor Certificate should enter the instructional hours flown during the preceding 36 months.				
SINGLE-ENGINE		MULTI-ENGINE		INSTRUMENT
DAY	NIGHT	DAY	NIGHT	
Total instructional hours (preceding 36 months):				
Total instructional hours (preceding 12 months):				

FLIGHT INSTRUCTOR / LIGHT AIRCRAFT FLIGHT INSTRUCTOR REFRESHER SEMINAR	
1	**This is to certify that the undersigned attended a Flight Instructor / Light Aircraft Flight Instructor Seminar ~~approved by the Authority~~**
2	**Attendee's personal particulars:**
Name:	Address:
Licence number:	Exp. date of FI(A) / LAFI(A) certificate
3	**Seminar particulars:**
Date/s of seminar:	Place:
4	**Declaration by the responsible organiser:**
I certify that the above data are correct and that the Flight Instructor Seminar / Light Aircraft Flight Instructor Seminar was carried out ~~as approved by the Authority..~~	
Date of approval:	Name of organiser: (block letters)
Date and place:	Signature:
5	**Declaration by the attendee:**
I confirm the data under 1 through 3	
Attendee's signature:	

PROFICIENCY CHECK
.......................................(Name of applicant) has given proof of flying

instructional ability during a proficiency check flight. This was done to ***the*** *~~my~~ ~~sati~~***required standard***~~sfaction~~.*

Flying time:	Aeroplane/Sim. used:
Main exercise:	
Name of FIE:	Licence number:
Date and place:	Signature:

B. HELICOPTERS

INSTRUCTIONAL FLYING EXPERIENCE [ ]
Instructors applying for revalidation of the Flight Instructor Certificate / Light Aircraft Flight Instructor Certificate should enter the instructional hours flown during the preceding 36 months.
INSTRUMENT:
Total instructional hours (preceding. 36 months):
Total instructional hours (preceding. 12 months):

FLIGHT INSTRUCTOR / LIGHT AIRCRAFT FLIGHT INSTRUCTOR REFRESHER SEMINAR	
1	**This is to certify that the undersigned attended a Flight Instructor Seminar / Light Aircraft Flight Instructor Seminar ~~approved by the Authority~~**
2	**Attendees personal particulars:**

Name:	Address:
Licence number:	Exp. date of FI(H) / LAFI(H) certificate:

3	**Seminar particulars:**		
Date/s of seminar:		Place:	
4	**Declaration by the responsible organiser:**		
I certify that the above data are correct and that the Flight Instructor / Light Aircraft Flight Instructor Seminar was carried out ~~as approved by the Authority.~~			
Date of approval:		Name of organiser: (block letters)	
Date and place:		Signature:	
5	**Declaration by the attendee:**		
I confirm the data under 1 through 3			
Attendee's signature:			

PROFICIENCY CHECK	
*..(Name of applicant) has given proof of flying instructional ability during a proficiency check flight. This was done **to the required standard**~~to my satisfaction~~.*	
Flying time:	Helicopter/Flight simulator used:
Main exercise:	
Name of FIE:	Licence number:
Date and place:	
Signature:	

C. AIRSHIPS

INSTRUCTIONAL FLYING EXPERIENCE				
Instructors applying for revalidation of the Flight Instructor Certificate should enter the instructional hours flown during the preceding 36 months.				
SINGLE-ENGINE		MULTI-ENGINE		INSTRUMENT
DAY	NIGHT	DAY	NIGHT	
Total instructional hours (preceding 36 months):				
Total instructional hours (preceding 12 months):				

FLIGHT INSTRUCTOR REFRESHER SEMINAR		
1	**This is to certify that the undersigned attended a Flight Instructor Seminar ~~approved by the Authority~~**	
2	**Attendee's personal particulars:**	
Name:		Address:
Licence number:		Exp. date of FI(A~~S~~**s**) certificate:
3	**Seminar particulars:**	
Date/s of seminar:		Place:
4	**Declaration by the responsible organiser:**	
I certify that the above data are correct and that the Flight Instructor Seminar was carried out ~~as approved by the Authority~~.		
Date of approval:		Name of organiser: (block letters)
Date and place:		Signature:
5	**Declaration by the attendee:**	
I confirm the data under 1 through 3		
Attendee's signature:		

PROFICIENCY CHECK	
..(Name of applicant) has given proof of flying instructional ability during a proficiency check flight. This was done to ***the required standard*** *~~my satisfaction~~.*	
Flying time:	Airship/Sim. used:

Main exercise:	
Name of FIE:	Licence number:
Date and place:	Signature:

D. SAILPLANES

INSTRUCTIONAL FLYING EXPERIENCE			
Instructors applying for revalidation of the Flight Instructor / Light Aircraft Flight Instructor Certificate should enter the instructional hours and take offs flown during the preceding 36 months.			
SAILPLANE (hours/take-offs)		TOURING MOTOR GLIDER (hours/tak offs)	
DAY	NIGHT	DAY	NIGHT
Total instructional hours (preceding 36 months):			
Total instructional hours (preceding 12 months):			
Total amount of take-offs (preceding 36 months):			
Total amount of take-offs (preceding 12 months):			

FLIGHT INSTRUCTOR REFRESHER SEMINAR		
1	**This is to certify that the undersigned attended a Flight Instructor / Light Aircraft Flight Instructor Seminar ~~approved by the Authority~~**	
2	**Attendee's personal particulars:**	
Name:		Address:
Licence number:		Exp. date of FI(S) / LAFI(S) certificate:
3	**Seminar particulars:**	
Date/s of seminar:		Place:
4	**Declaration by the responsible organiser:**	
I certify that the above data are correct and that the Flight Instructor / Light Aircraft Flight Instructor Seminar was carried out ~~as approved by the Authority~~.		

Date of approval:	Name of organiser: (block letters)
Date and place:	Signature:

5	**Declaration by the attendee:**
I confirm the data under 1 through 3	
Attendee's signature:	

PROFICIENCY CHECK	
..(Name of applicant) has given proof of flying instructional ability during a proficiency check flight. This was done to ***the required standard*** *~~my satisfaction~~.*	
Flying time:	Sailplane/TMG used:
Main exercise:	
Name of FIE/FIE(LAFI):	Licence number:
Date and place:	Signature:

E. BALLOONS

INSTRUCTIONAL FLYING EXPERIENCE					
Instructors applying for revalidation of the Flight Instructor / Light Aircraft Flight Instructor Certificate should enter the instructional hours flown during the preceding 36 months.					
Balloons (gas)		Balloons (hot air)		Hot air airships	
DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
Total instructional hours (preceding 36 months):					
Total instructional hours (preceding 12 months):					
FLIGHT INSTRUCTOR REFRESHER SEMINAR					

1	**This is to certify that the undersigned attended a Flight Instructor / Light Aircraft Flight Instructor Seminar ~~approved by the Authority~~**
2	**Attendee's personal particulars:**

Name:		Address:
Licence number:		Exp. date of FI(B)/LAFI(B) certificate:
3	**Seminar particulars:**	
Date/s of seminar:		Place:
4	**Declaration by the responsible organiser:**	
I certify that the above data are correct and that the Flight Instructor / Light Aircraft Flight Instructor Seminar was carried out ~~as approved by the Authority~~.		
Date of approval:		Name of organiser: (block letters)
Date and place:		Signature:
5	**Declaration by the attendee:**	
I confirm the data under 1 through 3		
Attendee's signature:		
PROFICIENCY CHECK		
......................................(Name of applicant) has given proof of flying instructional ability during a proficiency check flight. This was done to ***the required standard*** *~~my satisfaction~~.*		
Flying time:		Balloon/Hot Air Airship used:
Main exercise:		
Name of FIE/FIE(LAFI):		Licence number:
Date and place:		Signature:

AMC No 1 to FCL.930.TRI

TRI training course - aeroplanes

GENERAL

1. The aim of the TRI (A) course is to train ~~aircraft~~ **aeroplane** licence holders to the level of competence defined in FCL.920 and adequate for a TRI.

2. The course should develop safety awareness throughout by teaching the knowledge, skills and attitudes relevant to the TRI task, and should be designed to give adequate training to the applicant in theoretical knowledge instruction, flight instruction and synthetic flight instruction in order to instruct for a**n** ~~multi-pilot~~ aeroplane type rating for which the applicant is qualified.

3. The TRI course should give particular emphasis to the role of the individual in relation to the importance of human factors in the man-machine environment and the role of CRM**.**

4. Special attention should be given to the applicant's maturity and judgment including an understanding of adults, their ~~behavioral~~**behavioural** attitudes and variable levels of learning ability. During the course the applicants should be made aware of their own attitudes to the importance of flight safety. It will be important during the course of training to aim at giving the applicant the knowledge, skills and attitudes relevant to the role of the Type Rating Instructor.

5. For a TRI the amount of flight training will vary depending on the complexity of the ~~aircraft~~ **aeroplane** type. A similar number of hours should be used for the instruction and practice of pre-flight and post flight briefing for each exercise. The flight instruction should aim to ensure that the applicant is able to teach the air exercises safely and efficiently and should be related to the type of ~~aircraft~~**aeroplane** on which the applicant wishes to instruct. The content of the training program should ~~only~~ cover training exercises applicable to the ~~aircraft~~**aeroplane** type as set out in the applicable type rating courses.

6. A TRI(A) may instruct in a TRI(A) course once he/she has conducted a minimum of 4 type rating instruction courses.

CONTENT

7. The course consists of **3**~~2~~ parts:

- Part 1**: Teaching and learning**~~,~~ that should **include the content of the** ~~comply with~~ AMC to FCL.920**. The content of the teaching and learning Part of the LAFI course, as established in AMC to FCL.930.LAFI, may be used as guidance to develop the course syllabus**
- Part 2**: Technical Training;**~~, that should have the following content:~~
- **Part-3: Flight Instruction.**

~~FLIGHT AND/OR SYNTHETIC DEVICE TRAINING INSTRUCTOR COMPETENCY COURSE~~

PART 2 TECHNICAL TRAINING

8. The technical theoretical knowledge instruction should comprise of not less than 10 hours training to include the revision of technical knowledge, the preparation of lesson plans and the development of classroom instructional skills to enable the TRI(A) to instruct the technical theoretical knowledge syllabus.

9. If a TRI (A) certificate for multi-pilot aeroplanes is sought, particular attention should be given to multi-crew cooperation. If a TRI (A) certificate for single pilot aeroplanes is sought particular attention should be given to the duty in single-pilot operations.

10. The type rating theoretical syllabus should be used to develop the TRI(H)'s teaching skills in relation to the type technical course syllabus. The course instructor should deliver example lectures from

the applicable type technical syllabus and the candidate instructor should prepare and deliver lectures on topics selected by the course instructor from the type rating course.

PART-3 – FLIGHT INSTRUCTION

11 The course should be related to the type of ~~aircraft~~**aeroplane** on which the applicant wishes to instruct.

12. TEM, CRM and the appropriate use of behavioural markers should be integrated throughout

13. The content of the training programme should cover ~~identified and~~**all the** significant exercises applicable to the ~~aircraft~~**aeroplane** type.

~~SYNTHETIC DEVICE TRAINING~~

14. The applicant for a TRI(A) certificate should be taught and made familiar with the device, its limitations, capabilities and safety features, and the instructor station**, including emergency evacuation**.

FSTD TRAINING

15. The applicant for a TRI(A) certificate should be taught and made familiar with giving instruction from ~~the seat normally occupied by the co-pilot~~ **the instructor station. In addition, before being checked for base training instruction, the applicant for a TRI(A) should be taught ands made familiar with giving instruction from all operating positions**, including demonstrations of appropriate handling exercises.

16. Courses should be developed in order to give the applicant experience in training a variety of exercises, covering both normal and abnormal operations. The syllabus should be tailored appropriate to the ~~aircraft~~**aeroplane** type, using exercises considered more demanding for the student. This should include engine-out handling and engine out operations in addition to representative exercises from the type transition course.

17. The applicant should be required to plan, brief, train and debrief sessions using all relevant training techniques.

~~At the completion of training the applicant should be required to pass a formal test demonstrating all of the competencies listed in FCL.920.~~

~~AIRCRAFT~~ **AEROPLANE** TRAINING

18. The applicant for a TRI(A) certificate should receive instruction in a**n** ~~synthetic device~~**FFS** to a satisfactory level in:

18.1 Right Hand Seat familiarisation, which should include at least the following as pilot flying:

- Pre-flight preparation and use of checklists
- taxiing;
- take-off;
- rejected take-off
- engine failure during take-off, after V1
- engine inoperative approach and go-around; and

- one engine (critical) simulated inoperative landing
- other emergency and abnormal operating procedures (as necessary)

18.2 ~~Aircraft~~**Aeroplane** training techniques

- Methods for giving appropriate commentary
- Particularities of handling the ~~aircraft~~**aeroplane** in touch and go manoeuvres
- Intervention strategies developed from situations role-played by a TRI course instructor, taken from but not limited to:
  - (i) Take-off configuration warning
  - (ii) Over controlling
  - (iii) High flare - long float
  - (iv) Long flare
  - (v) Baulked landing
  - (vi) Immediate go around from touch
  - (vii) Too high on approach - no flare
  - (viii) Incorrect configuration
  - (ix) GPWS warning
  - (x) Misuse of rudder
  - (xi) Over control in roll axis during flare
  - (xii) Incapacitation
  - (xiii) Actual abnormal or emergencies

19. Additionally, if the applicant is required to train emergency/abnormal procedures in an ~~aircraft~~**aeroplane**, synthetic device training as follows:

- Appropriate methods and minimum altitudes for simulating failures
- Incorrect rudder inputs
- Failure of a critical engine
- Approach and full-stop landing with simulated engine-out

20. In this case, the abnormal manoeuvres refer to engine-out handling as necessary for completion of type rating training. If the applicant is required to train other abnormal items in the transition course, additional training will be required.

21. Upon successful completion of the training above, the applicant should receive training in an ~~aircraft~~**aeroplane** in flight under the supervision of a TRI**(A)** ~~instructor~~. At the completion of training the applicant instructor should be required to conduct a training flight under the supervision and to the satisfaction of a TRI (A) ~~designated~~ **nominated** for this purpose by the ~~Authority~~**training organisation**.

TRAINING FOR ASYMMETRIC POWER FLIGHT ON SINGLE-PILOT MULTI-ENGINE TURBOPROP AEROPLANES

22. During this part of the training, special emphasis is to be placed on the:

a. **Circumstances in which actual feathering and un-feathering practice will be done, i.e. safe altitude; compliance with regulations concerning minimum altitude/height for feathering practice, weather conditions, distance from nearest available aerodrome.**

b. **Procedure to use for instructor/student co-operation, e.g. the correct use of touch drills and the prevention of misunderstandings, especially during feathering and unfeathering practice and when zero thrust is being used for asymmetric circuits. This procedure is to include positive agreement as to which engine is being shut down/re-started or set at zero thrust and identifying each control and naming the engine it is going to affect.**

c. **Consideration to be given to avoid over-working the operating engine, and the degraded performance when operating the aeroplane during asymmetric flight.**

d. **Need to use the specific check list for the aeroplane type.**

LONG BRIEFINGS - FLIGHT ON ASYMMETRIC POWER

Introduction to asymmetric flight

Feathering the propeller

- **method of operation**

Effects on aeroplane handling at cruising speed

Introduction to effects upon aeroplane performance

Note foot load to maintain a constant heading (No rudder trim)

Un-feathering the propeller

- **regain normal flight**

Finding the zero thrust setting

- **comparison of foot load when feathered and with zero thrust set**

Effects and Recognition of Engine Failure in Level Flight

The forces and the effects of yaw

Types of failure

- **sudden or gradual**
- **complete or partial**

Yaw, direction and further effects of yaw

Flight instrument indications

Identification of Failed Engine

The couples and residual out of balance forces

- **resultant flight attitude**

Use of rudder to counteract yaw

Use of aileron

- **dangers of misuse**

Use of elevator to maintain level flight

Use of power to maintain a safe airspeed and altitude

Supplementary recovery to straight and level flight

- **simultaneous increase of speed and reduction in power**

Identification of failed engine

- **idle leg = idle engine**

Use of engine instruments for identification

- **fuel pressure/flow**
- **RPM gauge response effect of CSU action at lower and higher airspeed**
- **engine temperature gauges**

Confirmation of identification

- **close the throttle of identified failed engine**

Effects and recognition of engine failure in turns

Identification and control

Side forces and effects of yaw

DURING TURNING FLIGHT:

Effect of 'inside' engine failure

- **effect sudden and pronounced**

Effect of 'outside' engine failure

- **effect less sudden and pronounced**

The possibility of confusion in identification (particularly at low power)

- **correct use of rudder**
- **possible need to return to lateral level flight to confirm correct identification**

Visual and flight instrument indications

Effect of varying speed and power

Speed/thrust relationship

At normal cruising speed and cruising power

- **engine failure clearly recognised**

At low safe speed and climb power

- **engine failure most positively recognised**

High speed descent and low power

- **possible failure to notice asymmetry (engine failure)**

MINIMUM CONTROL SPEEDS

ASI colour coding – red radial line

NOTE: This exercise is concerned with the ultimate boundaries of controllability in various conditions that a student can reach in a steady asymmetric power state, approached by a gradual speed reduction. Sudden and complete failure should not be given at the Flight Manual Vmca. The purpose of the exercise is to continue the gradual introduction of a student to control an aeroplane in asymmetric power flight during extreme or critical situations. It is not a demonstration of Vmca.

Techniques for assessing critical speeds with wings level and recovery – dangers involved when minimum control speed and the stalling speed are very close

- **use of V_{sse}**

Establish a minimum control speed for each asymmetrically disposed engine

- **to establish critical engine (if applicable)**

Effects on minimum control speeds of:

- **bank**
- **zero thrust setting**
- **take-off configuration**

  landing gear down/take-off flap set

  landing gear up/take-off flap set

It is important to appreciate that the use of 5° of bank towards the operating engine produces a lower V_{mca} and also a better performance than that obtained with the wings held level. It is now normal for manufacturers to use 5ø of bank in this manner when determining the V_{mca} for the specific type. Thus the V_{mca} quoted in the aeroplane manual will have been obtained using the technique.

FEATHERING AND UN-FEATHERING

Minimum heights for practising feathering/un-feathering drills

Engine handling – Precautions (overheating, icing conditions, priming, warm up, method of simulating engine failure – reference to Aircraft Engine Manual and Service Instructions and Bulletins).

ENGINE FAILURE PROCEDURE

Once the maintenance of control has been achieved, the order in which the procedures are carried out will be determined by the phase of operation and the aircraft type.

Flight Phase

In cruising flight

Critical phase such as immediately after take-off or during the approach to landing or during a 'go around'.

AIRCRAFT TYPE

Variations will inevitably occur in the order of certain drills and checks due to differences between aeroplane types and perhaps between models of the same type, and the Flight/Owner's Manuals, Pilot's Operating Handbooks are to be consulted to establish the exact order of these procedures.

For example, one Flight/Owner's Manual/Pilot's Operating Handbook may call for the raising of flaps and landing gear prior to feathering, whilst another may recommend feathering as a first step. The reason for this latter procedure could be due to the fact that some engines cannot be feathered if the RPM drops below a certain figure.

Again, in some aeroplanes, the raising of the landing gear may create more drag during retraction due to the transient position of the landing gear doors and as a result of this retraction would best be left until feathering has been accomplished and propeller drag reduced.

Therefore, the order in which the drills and checks are shown in this syllabus under IMMEDIATE and SUBSEQUENT actions are to be used as a general guide only and the exact order of precedence is determined by reference to the Flight/Owner's Manual, Pilot's Operating Handbook for the specific aeroplane type being used on the course.

IN FLIGHT ENGINE FAILURE

In cruise or other flight phase not including take-off or landing.

Immediate Actions:

Recognition of Asymmetric Condition

Identification and Confirmation of Failed Engine

- **idle leg – idle engine**
- **closing of throttle for confirmation**

Cause and Fire Check

- **typical reasons for failure**
- **methods of rectification**

Feathering Decision and Procedure

- **reduction of other drag**
- **need for speed but not haste**
- **use of rudder trim**

Subsequent Actions:

Live Engine

- **temperature, pressures and power**
- **remaining services**
- **electrical load – assess and reduce as necessary**

- effect on power source for air driven instruments
- landing gear
- flaps and other services

Re-plan Flight

- ATC and weather
- terrain clearance, single-engine cruise speed
- decision to divert or continue

Fuel Management

- best use of remaining fuel

Dangers of re-starting damaged engine

Action if unable to maintain altitude

- effect of altitude on power available

Effects on Performance

Effects on power available and power required

Effects on various airframe configuration and propeller settings

Use of Flight/Owner's Manual

- cruising
- climbing – ASI colour coding (blue line)
- descending
- turning

'Live' Engine Limitations and Handling

Take-Off and Approach – Control and Performance

SIGNIFICANT FACTORS

Significance of Take-off safety speed

- effect of landing gear, flap, feathering, take-off, trim setting, systems for operating landing gear and flaps
- Effect on mass, altitude and temperature (performance)

Significance of Best Single-engine Climb Speed (V_{yse})

- acceleration to best engine climb speed and establishing a positive climb
- relationship of S/E climb speed to normal climb speed
- action if unable to climb

Significance of Asymmetric Committal Height and Speed

- action if baulked below asymmetric committal height

Engine Failure During Take-Off:

Below V_{mca} or unstick speed

accelerate/stop distance considerations

prior use of Flight Manual data if available

Above V_{mca} or unstick speed and below safety speed

Immediate re-landing or use of remaining power to achieve forced landing

Considerations:

- **degree of engine failure**
  - **speed at the time**
  - **mass, altitude, temperature (performance)**
  - **configuration**
  - **length of runway remaining**
  - **position of any obstacles ahead**

Engine Failure After Take-Off

Simulated at a safe height and at or above take-off safety speed

Considerations:

- **need to maintain control**
- **use of bank towards operating engine**
- **use of available power achieving best single-engine climb speed**
- **mass, altitude, temperature (performance)**
- **effect of prevailing conditions and circumstances**

IMMEDIATE ACTIONS:

Maintenance of control including airspeed and use of power.

Recognition of asymmetric condition

Identification and confirmation of failed engine

Feathering and removal of drag (procedure for type)

Establishing best single-engine climb speed

SUBSEQUENT ACTIONS:

Whilst carrying out an asymmetric power climb to the downwind position at single-engine best rate of climb speed:

Cause and fire check

Live engine, handling considerations

Remaining services

ATC liaison

Fuel management

NOTE: These procedures are applicable to aeroplane type and flight situation.

ASYMMETRIC COMMITTAL HEIGHT

Asymmetric Committal Height is the minimum height needed to establish a positive climb whilst maintaining adequate speed for control and removal of drag during an approach to a landing

Because of the significantly reduced performance of many JAR 23 aeroplanes when operating on one engine, consideration is to be given to a minimum height from which it would be safely possible to attempt a 'go around' procedure, during an approach when the flight path will have to be changed from a descent to a climb with the aeroplane in a high drag configuration.

Due to the height loss which will occur during the time that the operating engine is brought up to full power, landing gear and flap retracted, and the aeroplane established in a climb at V_{yse} a minimum height (often referred to as 'Asymmetric Committal Height') is to be selected, below which the pilot should not attempt to take the aeroplane round again for another circuit. This height will be compatible with the aeroplane type, all up weight, altitude of the aerodrome being used, air temperature, wind, the height of obstructions along the climb out path, and pilot competence.

Circuit Approach and Landing on Asymmetric Power

- **Definition and use of Asymmetric Committal Height**
- **Use of Standard Pattern and Normal Procedures**
- **Action if unable to maintain Circuit Height**
- **Speed and Power Settings Required**
- **Decision to land or go around at asymmetric committal height**
  - **factors to be considered**

Undershooting

- **importance of maintaining correct airspeed, (not below V_{yse})**

SPEED AND HEADING CONTROL

Height/speed/power relationship

- **need for minimum possible drag**

Establishing positive climb at best single-engine rate of climb speed

- **effect of availability of systems, power for flap and landing gear**
- **operation and rapid clean up**

NOTE 1: The airspeed at which the decision is made to commit the aeroplane to a landing or to go around should normally be the best single-engine rate of climb speed and in any case not less than the safety speed.

NOTE 2: On no account should instrument approach 'Decision Height' and its associated procedures be confused with the selection of minimum Height for initiating a go around in asymmetric power flight.

ENGINE FAILURE DURING AN ALL ENGINES APPROACH OR MISSED APPROACH

Use of asymmetric committal height and speed considerations

speed and heading control

- **decision to attempt a landing, 'go around' or force land as circumstances dictate**

NOTE: At least one demonstration and practice of engine failure in this situation should be performed during the course.

INSTRUMENT FLYING ON ASYMMETRIC POWER

Considerations relating to aircraft performance during:

- **straight and level flight**
- **climbing and descending**
- **standard rate turns:**
- **level, climbing and descending turns including turns onto pre-selected headings**

Vacuum operated instruments

- **availability**

Electrical power source

ADDITIONAL TRAINING FOR PRIVILEGES TO CONDUCT LINE FLYING UNDER SUPERVISION

23. **In order to be able to conduct line flying under supervision, as provided in FCL.910.TRI (a), the TRI should have received the training described in paragraph 21 of this AMC.**

TRAINING WHERE NO FSTD EXISTS

24. Where no synthetic device exists for the type for which the certificate is sought, a similar course of training should be conducted in the applicable ~~aircraft~~**aeroplane** type. This includes all elements listed under this sub paragraph, the synthetic device elements being replaced with appropriate exercises in an ~~aircraft~~**aeroplane** of the applicable type.

AMC No 2 to FCL.~~915~~930.TRI

TRI training course - helicopters

GENERAL

1. The aim of the TRI (H) course is to train helicopter licence holders to the level of competence defined in FCL.920 and adequate for a TRI**.**

2. The course should develop safety awareness throughout by teaching the knowledge, skills and attitudes relevant to the TRI(H) task, and should be designed to give adequate training to the applicant in theoretical knowledge instruction, flight instruction and synthetic flight instruction in order to instruct for a helicopter type rating for which the applicant is qualified

3. The TRI(H) course should give particular emphasis to the role of the individual in relation to the importance of human factors in the man-machine environment and the role of CRM. Special attention should be given to the applicant's maturity and judgment including an understanding of adults, their behavioural attitudes and variable levels of learning ability**.** During the course the applicants should be made aware of their own attitudes to the importance of flight safety. It will be important during the course of training to aim at giving the applicant the knowledge, skills and attitudes relevant to the role of the Type Rating Instructor.

4. For a TRI(H) certificate the amount of flight training will vary depending on the complexity of the helicopter type.

5. A similar number of hours should be used for the instruction and practice of pre-flight and post flight briefing for each exercise. The flight instruction should aim to ensure that the applicant is able to teach the air exercises safely and efficiently and should be related to the type of ~~aircraft~~**helicopter** on which the applicant wishes to instruct. The content of the training program should ~~only~~ cover training exercises applicable to the ~~aircraft~~**helicopter** type as set out in the applicable type rating course syllabus.

6. A TRI(H) may instruct in a TRI(H) course once he/she has conducted a minimum of 4 type rating instruction courses.

TRI(H) COURSE CONTENT

7. The course consists of 3 parts:

- Part 1 Teaching and Learning**,** that should comply with AMC to FCL.920
- Part 2 Technical Training
- Part 3 Flight Training

PART 2 TECHNICAL TRAINING

8. The technical theoretical knowledge instruction should comprise of not less than 10 hours training to include the revision of technical knowledge, the preparation of lesson plans and the development of classroom instructional skills to enable the TRI(H) to instruct the technical theoretical knowledge syllabus.

9. If a TRI(H) certificate for multi-pilot helicopters is sought, particular attention should be given to multi-crew cooperation.

10. The type rating theoretical syllabus should be used to develop the TRI(H)'s teaching skills in relation to the type technical course syllabus. –The course instructor should deliver example lectures from the applicable type technical syllabus and the candidate instructor should prepare and deliver ~~at least five~~ lectures~~, each of 45 minutes duration,~~ on topics selected by the course instructor from the subject list below.

~~(a)~~**10.1** Helicopter structure, transmissions, rotor and equipment, normal and abnormal operation of systems.

- Dimensions
- Engine including aux. power unit, rotors and transmissions
- Fuel system-
- Air-conditioning
- Ice protection, windshield wipers and rain repellent
- Hydraulic system

- Landing gear
- Flight controls, stability augmentation and autopilot systems
- Electrical power supply
- Flight instruments, communication, radar and navigation equipment
- Cockpit, cabin and cargo compartment
- Emergency equipment

~~(b)~~**10.2** Limitations

- General limitations, according to the helicopter flight manual
- Minimum equipment list

~~(c)~~**10.3** Performance, flight planning and monitoring

- Performance
- Flight planning

~~(d)~~**10.4** Load and balance and servicing

- Load and balance
- Servicing on ground

~~(e)~~**10.5** Emergency procedures

~~(f)~~**10.6** Special requirements for helicopters with electronic flight instrument systems (EFIS)

~~(g)~~**10.7** Optional equipment

PART 3 FLIGHT TRAINING

11. The amount of flight training will vary depending on the complexity of the helicopter type. At least 5 hours flight instruction for a single pilot helicopter and at least 10 hours for a multi-pilot multi-engine helicopter should be counted. A similar number of hours should be used for the instruction and practice of pre-flight and post flight briefing for each exercise. The flight instruction should aim to ensure that the applicant is able to teach the air exercises safely and efficiently and related to the type of helicopter on which the applicant wishes to instruct. The content of the training programme should only cover training exercises applicable to the helicopter type as set out in Appendix 9 to Part-FCL.

12. If a TRI(H) certificate for multi-pilot helicopters is sought, particular attention should be given to multi-crew cooperation.

13. If a TRI(H) certificate for revalidation of instrument ratings is sought, then the applicant should hold a valid instrument rating.

FLIGHT AND/OR FSTD TRAINING

1**4** The course should be related to the type of ~~aircraft~~**helicopter** on which the applicant wishes to instruct.

~~2~~**15** For multi-pilot helicopter type ratings MCC, CRM and the appropriate use of behavioural markers should be integrated throughout.

~~3~~**16** The content of the training programme should cover identified and significant exercises applicable to the helicopter type.

FSTD TRAINING

~~4~~**17** The applicant for a TRI(H) certificate should be taught and made familiar with the device, its limitations, capabilities and safety features, and the instructor station.

~~5~~**18** The applicant for a TRI(H) certificate should be taught and made familiar with giving instruction from the instructor station seat as well as the pilot's seats, including demonstrations of appropriate handling exercises.

~~6~~**19** Courses should be developed in order to give the applicant experience in training a variety of exercises, covering both normal and abnormal operations. —The syllabus should be tailored appropriate to the ~~aircraft~~**helicopter** type, using exercises considered more demanding for the student. This should include engine-out handling and engine out operations in addition to representative exercises from the type transition course.

~~AIRCRAFT~~**HELICOPTER** TRAINING

~~7~~**20** The applicant for a TRI(H) certificate should receive instruction in an FSTD to a satisfactory level in

~~7~~**20**.1 Left Hand Seat familiarisation, and in addition Right Hand Seat familiarisation where instruction is to be given to co-pilots operating in the Left Hand Seat, which should include at least the following as pilot flying:

(a) pre-flight preparation and use of checklists

(b) taxiing – ground and air;

(c) take-off and landings;

(d) engine failure during take-off, before DPATO;

(e) engine failure during take-off, after DPATO;

(f) engine inoperative approach and go-around;

(g) one engine simulated inoperative landing;

(h) autorotation to landing or power recovery

(i) other emergency and abnormal operating procedures (as necessary)

(j) instrument departure, approach and go-around with one engine simulated inoperative should be covered where TRI(H) privileges include giving instrument instruction for the extension of an IR(H) to additional types.

~~7~~**20**.2 ~~Aircraft~~**Helicopter** training techniques

(a) Methods for giving appropriate commentary

(b) Instructor demonstrations of critical manoeuvres with commentary

(c) Particularities and safety considerations associated with handling the ~~aircraft~~**helicopter** in critical manoeuvres such as one engine inoperative and autorotation exercises.

(d) Where relevant, the conduct of instrument training with particular emphasis on weather restrictions, dangers of icing and limitations on the conduct of critical manoeuvres in instrument meteorological conditions.

(e) Intervention strategies developed from situations role-played by a TRI(H) course instructor, taken from but not limited to:

(i) Incorrect helicopter configuration

(ii) Over controlling

(iii) Incorrect control inputs

(iv) Excessive flare close to the ground

(v) One Engine Inoperative take-off and landings

(vi) Incorrect handling of autorotation

(vii) Static or dynamic rollover on take-off or landing

(viii) Too high on approach with associated danger of vortex ring or settling with power

(ix) Incapacitation

(x) Abnormal and emergency procedures and appropriate methods and minimum altitudes for simulating failures in the ~~aircraft~~**helicopter**

(xi) Failure of the driving engine during OEI manoeuvres

~~8~~**21** Upon successful completion of the training above, the applicant should receive sufficient training in an ~~aircraft~~**helicopter** in flight under the supervision of a TRI(H) ~~instructor~~ to a level where the applicant is able to conduct the critical items of the type rating course to a safe standard. Of the minimum course requirements of 5 hours flight training for a single-pilot helicopter or 10 hours for a multi-pilot helicopter, up to 3 hours of this may be conducted in an FSTD.

TRAINING WHERE NO FSTD EXISTS

22 Where no synthetic device exists for the type for which the TRI(H) certificate is sought, a similar course of training should be conducted in the applicable ~~aircraft~~**helicopter** type. This includes all elements listed under sub paragraphs ~~7~~ **19**and ~~8~~**20**, the FSTD elements being replaced with appropriate exercises in an ~~aircraft~~**helicopter** of the applicable type, subject to any restrictions placed on the conduct of critical exercises associated with helicopter flight manual limitations and safety considerations.

AMC to FCL.930.CRI

CRI Training course

GENERAL

1. The aim of the CRI course is to train aircraft licence holders to the level of competence defined in FCL.920 and adequate to a CRI.

2. The training course should be designed to give adequate training to the applicant in theoretical knowledge instruction, flight instruction and synthetic flight instruction in order to instruct for any single-pilot multi-engine aeroplane class or type rating for which the applicant is qualified

3. The flight training should be aimed at ensuring that the applicant is able to teach the air exercises safely and efficiently to students undergoing a course of training for the issue of a single-pilot multi-engine class/type rating. The flight training may take place on the aeroplane or a flight simulator.

CONTENT

4. The course consists of 3 parts:

- Part 1, **Teaching and learning** that should ~~comply~~ **contain the elements in**~~with~~ AMC to FCL.920**. The content of the teaching and learning Part of the LAFI course, as established in AMC to FCL.930.LAFI, may be used as guidance to develop the course syllabus.**
- Part 2 and 3, that should have the following content:

PART 2

5. This syllabus is concerned only with the training on multi-engine aeroplanes. Therefore, other knowledge areas, common to both single- and multi-engine aeroplanes, should be revised as necessary to cover the handling and operating of the aeroplane with all engines operative, using the applicable sections of the Ground Subjects Syllabus for the flight instructor course. Additionally, the ground training should include 25 hours of classroom work to develop the applicant's ability to teach a student the knowledge and understanding required for the air exercise section of the multi-engine training course. This part will include the long briefings for the air exercises.

SUGGESTED BREAKDOWN OF COURSE CLASSROOM HOURS

Tuition hours	Practice in class	Topic	Internal progress test
1.00		Aviation legislation	1.00
2.00		Performance, all engines operating, including mass and balance	
2.00		Asymmetric flight Principles of flight	
2.00	2.00	Control in asymmetric flight Minimum control and safety speeds Feathering and unfeathering	
2.00		Performance in asymmetric flight	1.00
2.00		Specific type of aeroplane – operation of systems. Airframe and engine limitations	1.00
4.00	5.00	Briefings for air exercises progress	
15.00	7.00		3.00
Course total	25.00 (including progress test)		

SYLLABUS OF THEORETICAL KNOWLEDGE SUBJECTS

AIR LEGISLATION

Aeroplane performance group definitions ~~(JAA)~~.

Methods of factoring gross performance.

ASYMMETRIC POWER FLIGHT

PRINCIPLES OF FLIGHT

THE PROBLEMS

- asymmetry
- control
- performance

THE FORCES AND COUPLES

- offset thrust line
- asymmetric blade effect
- offset drag line
- failed engine propeller drag
- total drag increase
- asymmetry of lift
- uneven propeller slipstream effect
- effect of yaw in level and turning flight
- thrust and rudder side force couples
- effect on moment arms

CONTROL IN ASYMMETRIC POWER FLIGHT

- use, misuse and limits of:
  - rudder
  - aileron
  - elevators
- effect of bank/sideslip/balance
- decrease of aileron/rudder effectiveness
- fin stall possibility
- effect of ias/thrust relationship
- effect of residual unbalanced forces
- foot loads and trimming

MINIMUM CONTROL AND SAFETY SPEEDS

minimum control speed (V_{mc})

definition

origin

factors affecting (V_{mc})

thrust

mass and centre of gravity position

altitude

landing gear

flaps

cowl flaps/cooling gills

turbulence/gusts

pilot reaction/competence

banking towards the operating engine

drag

feathering

critical engine

take-off safety speed

definition/origin of V_2

other relevant V codes

AEROPLANE PERFORMANCE – ONE ENGINE INOPERATIVE

effect on excess power available

single-engine ceiling

cruising, range and endurance

acceleration/deceleration

zero thrust, definition and purpose

PROPELLERS

variable pitch – general principles

feathering/unfeathering mechanism and limitations

(e g minimum rpm)

SPECIFIC AEROPLANE TYPE

AEROPLANE AND ENGINE SYSTEMS

operation normal

operation abnormal

emergency procedures

LIMITATIONS – AIRFRAME

load factors

landing gear/flap limiting speeds (V_{lo} and V_{fe})

rough air speed (V_{ra})

maximum speeds (V_{no} and V_{ne})

LIMITATIONS – ENGINE

rpm and manifold pressure

oil temperature and pressure

emergency procedures

MASS AND BALANCE

(To be covered in conjunction with the flight/owner's manual/pilot's operating handbook)

mass and balance documentation for aeroplane type

revision of basic principles

calculations for specific aeroplane type

MASS AND PERFORMANCE

(To be covered in conjunction with the flight/owner's manual/pilot's operating handbook)

calculations for specific aeroplane type (all engines operating)

take-off run

take-off distance

accelerate/stop distance

landing distance

landing run

take-off/climb out flight path

calculations for specific aeroplane type (one engine operating)

climb out flight path

landing distance

landing run

PART 3

FLIGHT INSTRUCTION SYLLABUS – NORMAL FLIGHT

6. This part is similar to the Air Exercise Sections of the single-engine Flight Instructor course, including 'Introduction to Instrument Flying' except that the objectives, airmanship considerations and common errors are related to the operation of a multi-engine aeroplane.

7. The purpose of this part is to acquaint the applicant with the teaching aspects of the operational procedures and handling of a multi-engine aeroplane with all engines functioning.

8. The following items should be covered:

~~1~~- Aeroplane familiarisation

~~2~~- Pre-flight preparation and aeroplane inspection

~~3~~- Engine starting procedures

~~4~~- Taxiing

~~5~~- Pre-take-off procedures

~~6~~- The take-off and initial climb

into wind

crosswind

short field

~~7~~- Climbing

~~8~~- Straight and level flight

~~9~~- Descending (including emergency descent procedures)

~~10~~- Turning

~~11~~- Slow flight

~~12~~- Stalling and recoveries

~~13~~- Instrument flight – basic

~~14~~- Emergency drills (not including engine failure)

~~15~~- Circuit, approach and landing

into wind

crosswind

short field

~~16~~- Mislanding and going round again

~~17~~- Actions after flight

AIR EXERCISES

9. The following air exercises are developments of the Basic (single-engine) syllabus which are to be related to the handling of multi-engine types in order to ensure that the student learns the significance and use of controls and techniques which may be strange to the student in all normal, abnormal and emergency situations, except that engine failure and flight on asymmetric power are dealt with separately in the Air Exercises in Part 2.

LONG BRIEFING 1 - AEROPLANE FAMILIARISATION

introduction to the aeroplane

explanation of the:

cockpit layout

systems and controls

aeroplane power plant

check lists and drills

differences when occupying the instructor’s seat

EMERGENCY DRILLS

action in event of fire:

- in the air
- on the ground

Escape drills:

- location of exits
- emergency equipment, e.g. fire extinguishers, etc.

PRE-FLIGHT PREPARATION AND AEROPLANE INSPECTION

aeroplane documentation

external checks

internal checks

harness, seat/rudder pedal adjustment

ENGINE STARTING PROCEDURES

use of checklists

checks prior to starting

checks after starting

AIR EXERCISE 1

AEROPLANE FAMILIARISATION

external features

cockpit layout

aeroplane systems

check lists, drills

action in the event of fire in the air and on the ground

- – engine
- – cabin
- – electrical

systems failure (as applicable to type)

escape drills

- – location and use of emergency equipment and exits

PREPARATION FOR AND ACTION AFTER FLIGHT

flight authorisation and aeroplane acceptance

technical log/certificate of maintenance release

mass and balance and performance considerations

external checks

internal checks, adjustment of harness and/or rudder pedals starting and warming up engines

checks after starting

radio nav/com checks

altimeter checks and setting procedures

power checks

running down and switching off engines

completion of authorisation sheet and aeroplane serviceability documents

LONG BRIEFING 2 - TAXIING

pre-Taxiing area precautions

greater mass – greater inertia

effect of differential power

precautions on narrow taxiways

common errors

PRE TAKE-OFF PROCEDURES

use of checklist

engine power checks

pre take-off checks

instructor's briefing to cover the procedure to be followed should an emergency occur during take-off, e.g. engine failure

common errors

THE TAKE-OFF AND INITIAL CLIMB

ATC considerations

factors affecting the length of the take-off run/distance

correct lift-off speed

importance of safety speed

crosswind take-off, considerations and procedures

short field take-off, considerations and procedures

engine handling after take-off, throttle/pitch/engine synchronisation

common errors

CLIMBING

airmanship considerations

pre-climbing checks

engine considerations

use of throttle/pitch controls

maximum rate of climb speed

maximum angle of climb speed

synchronising the engines

common errors

AIR EXERCISE 2

TAXIING

checks before taxiing

starting and stopping

control of speed

control of direction and turning

turning in confined spaces

leaving the parking area

freedom of rudder movement (importance of pilot ability to use full rudder travel)

instrument checks

EMERGENCIES

brake/steering failure

PRE TAKE-OFF PROCEDURES

use of checklist

engine power and system checks

pre take-off checks

instructor's briefing in the event of:

- emergencies during take-off

THE TAKE-OFF AND INITIAL CLIMB

ATC considerations

directional control and use of power

lift-off speed

crosswind effects and procedure

short field take-off and procedure

procedures after take-off

- landing gear retraction
- flap retraction (as applicable)
- selection of manifold pressure and rpm
- engine synchronisation
- other procedures (as applicable)

at an appropriate stage of the course

CLIMBING

Pre-Climbing checks

Power Selection for Normal and Maximum Rate Climb

Engine and RPM Limitations

Effect of Altitude on Manifold Pressure, Full Throttle

Levelling Off – Power Selection

Climbing with Flaps Down

Recovery to Normal Climb

En Route Climb (Cruise Climb)

Maximum Angle of Climb

Altimeter Setting Procedures

Prolonged Climb and use of Cowl Flaps/Cooling Gills

Instrument Appreciation

LONG BRIEFING 3 - STRAIGHT AND LEVEL FLIGHT

Airmanship considerations

Selection of power – throttle/pitch controls

Engine synchronisation

Fuel consumption aspects

Use of trimming controls

  elevator, rudder (aileron as applicable)

Operation of flaps

  effect on pitch attitude

  effect on airspeed

Operation of landing gear

  effect on pitch attitude

  effect on airspeed

Use of mixture controls

Use of alternate air/carburettor heat controls

Operation of cowl flaps/cooling gills

Use of cabin ventilation and heating systems

Operation and use of the other systems (as applicable to type)

Common errors

DESCENDING

Airmanship considerations

  pre-descent checks

Normal descent

selection of throttle/pitch controls

engine cooling considerations

Emergency descent procedure

Common errors

TURNING

Airmanship considerations

Medium turns

Climbing/descending turns

Steep turns (45 degrees of bank or more)

Common errors

AIR EXERCISE 3

STRAIGHT AND LEVEL FLIGHT

At Normal Cruising Power

- selection of cruise power
- manifold pressure/RPM
- engine synchronisation
- use of trimming controls
- performance considerations – range/endurance

Instrument Appreciation

Operation of Flaps (in stages)

- airspeed below V_{fe}
- effect on pitch attitude
- effect on airspeed

Operation of Landing Gear

- airspeed below V_{lo}/V_{le}
- effect on pitch attitude
- effect on airspeed

Use of Mixture Controls

Use of Alternate Air/Carburettor Control

Operation of Cowl Flaps/Cooling Gills

Operation of Cabin Ventilation/Heating Systems

Operation and use of Other Systems (as applicable to type)

DESCENDING

Pre-Descent Checks

Power Selection – Manifold Pressure/RPM

Powered Descent (Cruise Descent)

Engine Cooling Considerations

– use of cowl flaps/cooling gills

Levelling Off

Descending with Flaps Down

Descending with Landing Gear Down

Altimeter Setting Procedure

Instrument Appreciation

Emergency Descent

– as applicable to type

– limitations in turbulence V_{no}

TURNING

Medium Turns

Climbing and Descending Turns

Steep Turns –45 degrees of Bank

Instrument Appreciation

LONG BRIEFING 4 - SLOW FLIGHT

Airmanship considerations

flight at V_{s1} and V_{so} +5 knots

aircraft handling characteristics

Simulated 'go around' from slow flight

at V_{sse} with flaps down

note pitch trim change

Common errors

STALLING

Airmanship considerations

Power selection

Symptoms approaching the stall

Full stall characteristics

Recovery from the full stall

Recovery at the incipient stall

Stalling and recovery in the landing configuration

Recovery at the incipient stage in the landing configuration

INSTRUMENT FLIGHT (BASIC)

Straight and level

Climbing

Turning

Descending

EMERGENCY DRILLS (not including engine failure)

As applicable to type

CIRCUIT APPROACH AND LANDING

Airmanship and ATC consideration

Downwind leg

- airspeed below V_{fe}
- use of flaps (as applicable)
- pre-landing checks
- position to turn onto base leg

Base leg

- selection of power (throttle/pitch), flaps and trimming controls
- maintenance of correct airspeed

Final approach

- power adjustments (early reaction to undershooting)
- use of additional flaps (as required)
- confirmation of landing gear down
- selection 'touch down' point
- airspeed reduction to V_{at}
- maintenance of approach path

Landing

- greater sink rate
- longer landing distance and run
- crosswind approach and landing
- crosswind considerations
- short field approach and landing
- short field procedure – considerations

AIR EXERCISE 4

SLOW FLIGHT

Safety Checks

Setting up and Maintaining (Flaps Up)

- V_{s1} + 5 knots
- note aeroplane handling characteristics

Setting up and Maintaining (Flaps Down)

- V_{so} + 5 knots

note aeroplane handling characteristics

Simulated 'Go Around' from a Slow Flight with Flaps

Down and airspeed not below V_{sse}, e.g. airspeed at V_{sse} or V_{mca} + 10 knots

increase to full power and enter a climb

note pitch change

Resume Normal Flight

STALLING

- airmanship considerations
- selection of RPM
- stall symptoms
- full stall characteristics
- recovery from the full stall
  - care in application of power
- recovery at the incipient stage
- stalling and recovery in landing configuration
- stall recovery at the incipient stage in the landing configuration

INSTRUMENT FLIGHT (BASIC)

- straight and level
- climbing
- turning
- descending

EMERGENCY DRILLS (not including engine failure)

As applicable to type

CIRCUIT, APPROACH AND LANDING

Airmanship and ATC considerations

Downwind leg

- control of speed (below V_{fe})
- flaps as applicable
- pre-landing checks
- control of speed and height
- base leg turn

Base leg

- power selection
- use of flap and trimming controls
- maintenance of correct airspeed

Final approach

- use of additional flap (as required)
- confirmation of landing gear down
- selection of touchdown point
- airspeed reduction to V_{at}
- maintaining correct approach path
  - use of power

Landing

- control of sink rate during flare
- crosswind considerations
- longer landing roll
- short/soft field approach and landing
- considerations and precautions

ASYMMETRIC POWER FLIGHT

During this part, special emphasis is to be placed on the:

a. Circumstances in which actual feathering and unfeathering practice will be done, i.e. safe altitude; compliance with regulations concerning minimum altitude/height for feathering practice, weather conditions, distance from nearest available aerodrome.

b. Procedure to use for instructor/student co-operation, e.g. the correct use of touch drills and the prevention of misunderstandings, especially during feathering and unfeathering practice and when zero thrust is being used for asymmetric circuits. This procedure is to include positive agreement as to which engine is being shut down/re-started or set at zero thrust and identifying each control and naming the engine it is going to affect.

c. Consideration to be given to avoid over-working the operating engine, and the degraded performance when operating the aeroplane during asymmetric flight.

d. Need to use the specific check list for the aeroplane type.

LONG BRIEFING 5 - FLIGHT ON ASYMMETRIC POWER

Introduction to asymmetric flight

Feathering the propeller

- method of operation

Effects on aeroplane handling at cruising speed

Introduction to effects upon aeroplane performance

Note foot load to maintain a constant heading (No rudder trim)

Unfeathering the propeller

- regain normal flight

Finding the zero thrust setting

- comparison of foot load when feathered and with zero thrust set

Effects and Recognition of Engine Failure in Level Flight

The forces and the effects of yaw

Types of failure

- sudden or gradual
- complete or partial

Yaw, direction and further effects of yaw

Flight instrument indications

Identification of Failed Engine

The couples and residual out of balance forces

- resultant flight attitude

Use of rudder to counteract yaw

Use of aileron

- dangers of misuse

Use of elevator to maintain level flight

Use of power to maintain a safe airspeed and altitude

Supplementary recovery to straight and level flight

- simultaneous increase of speed and reduction in power

Identification of failed engine

- idle leg = idle engine

Use of engine instruments for identification

- fuel pressure/flow
- RPM gauge response effect of CSU action at lower and higher airspeed
- engine temperature gauges

Confirmation of identification

- close the throttle of identified failed engine

Effects and recognition of engine failure in turns

Identification and control

Side forces and effects of yaw

DURING TURNING FLIGHT:

Effect of 'inside' engine failure

- effect sudden and pronounced

Effect of 'outside' engine failure

- effect less sudden and pronounced

The possibility of confusion in identification (particularly at low power)

- correct use of rudder
- possible need to return to lateral level flight to confirm correct identification

Visual and flight instrument indications

Effect of varying speed and power

Speed/thrust relationship

At normal cruising speed and cruising power

- engine failure clearly recognised

At low safe speed and climb power

- engine failure most positively recognised

High speed descent and low power

- possible failure to notice asymmetry (engine failure)

MINIMUM CONTROL SPEEDS

ASI colour coding – red radial line

NOTE: –This exercise is concerned with the ultimate boundaries of controllability in various conditions that a student can reach in a steady asymmetric power state, approached by a gradual speed reduction. Sudden and complete failure should not be given at the Flight Manual Vmca. The purpose of the exercise is to continue the gradual introduction of a student to control an aeroplane in asymmetric power flight during extreme or critical situations. It is not a demonstration of Vmca.

Techniques for assessing critical speeds with wings level and recovery – dangers involved when minimum control speed and the stalling speed are very close

- use of V_{sse}

Establish a minimum control speed for each asymmetrically disposed engine

- to establish critical engine (if applicable)

Effects on minimum control speeds of:

- bank
- zero thrust setting
- take-off configuration

  landing gear down/take-off flap set

  landing gear up/take-off flap set

It is important to appreciate that the use of 5°ø of bank towards the operating engine produces a lower V_{mca} and also a better performance than that obtained with the wings held level. It is now normal for manufacturers to use 5ø of bank in this manner when determining the V_{mca} for the specific type. Thus the V_{mca} quoted in the aeroplane manual will have been obtained using the technique.

FEATHERING AND UNFEATHERING

Minimum heights for practising feathering/unfeathering drills

Engine handling – Precautions (overheating, icing conditions, priming, warm up, method of simulating engine failure – reference to Aircraft Engine Manual and Service Instructions and Bulletins).

ENGINE FAILURE PROCEDURE

Once the maintenance of control has been achieved, the order in which the procedures are carried out will be determined by the phase of operation and the aircraft type.

Flight Phase

In cruising flight

Critical phase such as immediately after take-off or during the approach to landing or during a 'go around'.

AIRCRAFT TYPE

Variations will inevitably occur in the order of certain drills and checks due to differences between aeroplane types and perhaps between models of the same type, and the Flight/Owner's Manuals, Pilot's Operating Handbooks are to be consulted to establish the exact order of these procedures.

For example, one Flight/Owner's Manual/Pilot's Operating Handbook may call for the raising of flaps and landing gear prior to feathering, whilst another may recommend feathering as a first step. The reason for this latter procedure could be due to the fact that some engines cannot be feathered if the RPM drops below a certain figure.

Again, in some aeroplanes, the raising of the landing gear may create more drag during retraction due to the transient position of the landing gear doors and as a result of this retraction would best be left until feathering has been accomplished and propeller drag reduced.

Therefore, the order in which the drills and checks are shown in this syllabus under IMMEDIATE and SUBSEQUENT actions are to be used as a general guide only and the exact order of precedence is determined by reference to the Flight/Owner's Manual, Pilot's Operating Handbook for the specific aeroplane type being used on the course.

IN FLIGHT ENGINE FAILURE

In cruise or other flight phase not including take-off or landing.

Immediate Actions:

Recognition of Asymmetric Condition

Identification and Confirmation of Failed Engine

- idle leg – idle engine
- closing of throttle for confirmation

Cause and Fire Check

- typical reasons for failure
- methods of rectification

Feathering Decision and Procedure

- reduction of other drag
- need for speed but not haste
- use of rudder trim

Subsequent Actions:

Live Engine

- temperature, pressures and power
- remaining services
- electrical load – assess and reduce as necessary
- effect on power source for air driven instruments
- landing gear
- flaps and other services

Re-plan Flight

- ATC and weather
- terrain clearance, single-engine cruise speed
- decision to divert or continue

Fuel Management

- best use of remaining fuel

Dangers of re-starting damaged engine

Action if unable to maintain altitude

- effect of altitude on power available

Effects on Performance

Effects on power available and power required

Effects on various airframe configuration and propeller settings

Use of Flight/Owner's Manual

- cruising
- climbing – ASI colour coding (blue line)
- descending
- turning

'Live' Engine Limitations and Handling

Take-Off and Approach – Control and Performance

SIGNIFICANT FACTORS

Significance of Take-off safety speed

- effect of landing gear, flap, feathering, take-off, trim setting, systems for operating landing gear and flaps
- Effect on mass, altitude and temperature (performance)

Significance of Best Single-engine Climb Speed (V_{yse})

- acceleration to best engine climb speed and establishing a positive climb
- relationship of S/E climb speed to normal climb speed
- action if unable to climb

Significance of Asymmetric Committal Height and Speed

- action if baulked below asymmetric committal height

Engine Failure During Take-Off:

Below V_{mca} or unstick speed

accelerate/stop distance considerations

prior use of Flight Manual data if available

Above V_{mca} or unstick speed and below safety speed

Immediate re-landing or use of remaining power to achieve forced landing

Considerations:

- degree of engine failure
  - speed at the time
  - mass, altitude, temperature (performance)
  - configuration
  - length of runway remaining
  - position of any obstacles ahead

Engine Failure After Take-Off

Simulated at a safe height and at or above take-off safety speed

Considerations:

- need to maintain control
- use of bank towards operating engine
- use of available power achieving best single-engine climb speed
- mass, altitude, temperature (performance)
- effect of prevailing conditions and circumstances

IMMEDIATE ACTIONS:

Maintenance of control including airspeed and use of power.

Recognition of asymmetric condition

Identification and confirmation of failed engine

Feathering and removal of drag (procedure for type)

Establishing best single-engine climb speed

SUBSEQUENT ACTIONS:

Whilst carrying out an asymmetric power climb to the downwind position at single-engine best rate of climb speed:

Cause and fire check

Live engine, handling considerations

Remaining services

ATC liaison

Fuel management

NOTE: –These procedures are applicable to aeroplane type and flight situation.

ASYMMETRIC COMMITTAL HEIGHT

Asymmetric Committal Height is the minimum height needed to establish a positive climb whilst maintaining adequate speed for control and removal of drag during an approach to a landing

Because of the significantly reduced performance of many **CS/**JAR**/FAR** 23 aeroplanes when operating on one engine, consideration is to be given to a minimum height from which it would be safely possible to attempt a 'go around' procedure, during an approach when the flight path will have to be changed from a descent to a climb with the aeroplane in a high drag configuration.

Due to the height loss which will occur during the time that the operating engine is brought up to full power, landing gear and flap retracted, and the aeroplane established in a climb at V_{yse} a minimum height (often referred to as 'Asymmetric Committal Height') is to be selected, below which the pilot should not attempt to take the aeroplane round again for another circuit. This height will be compatible with the aeroplane type, all up weight, altitude of the aerodrome being used, air temperature, wind, the height of obstructions along the climb out path, and pilot competence.

Circuit Approach and Landing on Asymmetric Power

- Definition and use of Asymmetric Committal Height
- Use of Standard Pattern and Normal Procedures
- Action if unable to maintain Circuit Height
- Speed and Power Settings Required
- Decision to land or go around at asymmetric committal height
  - factors to be considered

Undershooting

- importance of maintaining correct airspeed, (not below V_{yse})

SPEED AND HEADING CONTROL

Height/speed/power relationship

- need for minimum possible drag

Establishing positive climb at best single-engine rate of climb speed

- effect of availability of systems, power for flap and landing gear
- operation and rapid clean up

NOTE 1: The airspeed at which the decision is made to commit the aeroplane to a landing or to go around should normally be the best single-engine rate of climb speed and in any case not less than the safety speed.

NOTE 2: On no account should instrument approach 'Decision Height' and its associated procedures be confused with the selection of minimum Height for initiating a go around in asymmetric power flight.

ENGINE FAILURE DURING AN ALL ENGINES APPROACH OR MISSED APPROACH

Use of asymmetric committal height and speed considerations

speed and heading control

- decision to attempt a landing, 'go around' or force land as circumstances dictate

NOTE: At least one demonstration and practice of engine failure in this situation should be performed during the course.

INSTRUMENT FLYING ON ASYMMETRIC POWER

Considerations relating to aircraft performance during:

- straight and level flight
- climbing and descending
- standard rate turns:
- level, climbing and descending turns including turns onto pre-selected headings

Vacuum operated instruments

- availability

Electrical power source

- availability

FLIGHT INSTRUCTION AIR EXERCISES

ASYMMETRIC POWER FLIGHT

This section covers the operation of a single-pilot multi-engine aeroplane when one engine has failed and it is applicable to all such light piston aeroplanes. Check lists should be used as applicable.

AIR EXERCISES

FLIGHT ON ASYMMETRIC POWER

Introduction to asymmetric flight

- close the throttle of one engine
- feather its propeller
- effects on aeroplane handling at cruising speed
- effects on aeroplane performance e.g. cruising speed and rate of climb
- note foot load to maintain a constant heading
- unfeather the propeller
- return to normal flight finding the zero thrust throttle setting
- comparison of foot load when feathered and with zero thrust set

Effects and Recognition of Engine Failure in Level Flight with the aeroplane straight and level at cruise speed

- slowly close the throttle of one engine
- note yaw, roll and spiral descent

Return to normal flight

- close throttle of other engine
- note same effects in opposite direction

Methods of Control and identification of Failed Engine close one throttle and maintain heading and level flight by use of

- rudder to control yaw
- aileron to hold wings level
- elevators to maintain level flight
- power (as required) to maintain airspeed and altitude

Alternative/supplementary Method of Control

- simultaneously:
  - lower aeroplane nose to increase airspeed
  - reduce power
  - loss of altitude – inevitable

Identification of failed engine

- idle foot = idle engine

Use of instruments for identification

- fuel pressure/fuel flow
- RPM gauge/CSU action may mask identification
- engine temperature gauges

Confirmation of identification

- close the throttle of the identified failed engine

Effects and recognition of Engine Failure in Turns/Effects of 'inside' engine failure

- more pronounced yaw
- more pronounced roll
- more pronounced pitch down

Effects of 'outside' engine failure

- less pronounced yaw
- less pronounced roll
- less pronounced pitch down

Possibility of confusion in identification

- use of correct rudder application
- return to lateral level flight if necessary

Flight instrument indications

Effect of Varying Speed and Power

Failure of one engine at cruise speed and power

- engine failure clearly recognised

Failure of one engine at low speed and high power (not below V_{sse})

- engine failure most positively recognised

Failure of one engine at higher speeds and low power

- possible failure to recognise engine failure

Minimum Control speeds

Establish the V_{yse}

- select maximum permitted manifold pressure and RPM
- close the throttle on one engine
- raise the aeroplane nose and reduce the airspeed
- note the airspeed when maximum rudder deflection is being applied and when directional control can no longer be maintained
- lower the aeroplane nose and reduce power until full directional control is regained
- the lowest airspeed achieved prior to the loss of directional control will be the V_{mc} for the flight condition
- repeat the procedure closing the throttle of the other engine
- the higher of these two airspeeds will identify the most critical engine to fail

Warning

In the above situations the recovery is to be initiated immediately before directional control is lost with full rudder applied, or when a safe margin above the stall remains, e.g. when the stall warning device operates, for the particular aeroplane configuration and flight conditions. On no account should the aeroplane be allowed to decelerate to a lower airspeed.

Establish the effect of using 5ø of bank at V_{mc}

- close the throttle of one engine
- increase to full power on the operating engine
- using 5ø of bank towards the operating engine reduce speed to the V_{mc}
- note lower V_{mc} when 5ø of bank is used

'In flight' Engine Failure Procedure

In cruise and other flight circumstances not including take-off and landing.

IMMEDIATE ACTIONS:

Maintenance of control and use of power

- identification of failed engine

- confirmation of failed engine
- failure cause and fire check
- feathering decision and implementation
- reduction of any other drag, e.g. flaps, cowl flaps etc.
- retrim and maintain altitude

SUBSEQUENT ACTIONS:

Live Engine:

- oil temperature and pressure. Fuel flow and power
- remaining services
- electrical load – assess and reduce as necessary
- effect on power source for air driven instruments
- landing gear
- flaps and other services

Re-plan Flight

- ATC and weather
- terrain clearance
- single-engine cruise speed
- decision to divert or continue

Fuel Management

- best use of fuel

Dangers of Re-starting Damaged Engine

Action if unable to maintain altitude

- adopt V_{yse}
- effect of altitude on power available

Effects on performance

Effects on Power Available and Power Required

Effects on various airframe configurations and propeller settings

Use of Flight/Owner's Manual

- cruising
- climbing – ASI colour coding (blue line)
- descending
- turning

'Live' Engine Limitations and Handling

Take-Off and Approach – Control and handling

NOTE: To be done at a safe height away from the circuit

Take-off case with Landing Gear Down and Take-Off Flap Set (if applicable)

Significance of Take-Off at or above Safety Speed

- at safety speed. The ability to maintain control and to accelerate to SE climb speed with aeroplane clean and zero thrust set. Thereafter to achieve a positive climb.

Significance of flight below Safety Speed

- below safety speed and above V_{mca}. A greater difficulty to maintain control, a possible loss of height whilst maintaining speed, cleaning up, accelerating to SE climb speed and establishing a positive climb.

Significance of Best Single-engine Climb Speed

- the ability to achieve the best rate of climb on one engine with minimum delay.

Significance of Asymmetric Committal Height

- the ability to maintain or accelerate to the best single-engine rate of climb speed and to maintain heading whilst cleaning up with perhaps a slight height loss before climbing away
- below this height, the aeroplane is committed to continue the approach to a landing.

Engine Failure During Take-Off

- during the take-off run and below safety speed briefing only

Engine Failure after take-Off

NOTE: To be initiated at a safe height and at not less than take-off safety speed with due regard to the problems of a prolonged single-engine climb in the prevailing conditions.

Immediate Actions:

control of direction and use of bank

control of airspeed and use of power

recognition of asymmetric condition

identification and confirmation of failed engine feathering and reduction of drag (procedure for type)

re-trim

Subsequent Actions

Whilst carrying out an asymmetric power climb to the downwind position at single-engine best rate of climb speed:

- cause and fire check
- live engine, handling considerations
- drills and procedures applicable to aeroplane type and flight situation
- ATC liaison
- fuel management

Asymmetric Circuit, Approach and Landing

Downwind and Base Legs

- use of standard pattern
- normal procedures
- landing gear and flap lowering considerations
- position for base leg
- live engine handling
- airspeed and power settings
- maintenance of height

Final Approach

- Asymmetric Committal Height drill
- control of airspeed and descent rate
- flap considerations

Going Round Again on Asymmetric Power (Missed Approach)

- not below Asymmetric Committal Height
- speed and heading control
- reduction of drag, landing gear retraction
- maintaining V_{yse}
- establish positive rate of climb

Engine failure during ALL engines approach or missed approach

NOTE: To be started at not less than asymmetric committal height and speed and not more than part flap set.

- speed and heading control
- reduction of drag flap
- decision, attempt landing or go around
- control of descent rate if approach is continued
- if go around is initiated, maintain V_{yse}, flaps and landing gear retracted and establish positive rate of climb

NOTE: At least one demonstration and practice of engine failure in this situation should be performed during the course.

Instrument flying on asymmetric power

Flight instrument checks and services available

- straight and level flight
- climbing and descending
- standard rate turns
- level, climbing and descending turns including turns onto pre-selected headings

AMC No 1 to FCL.940.CRI

Revalidation and renewal of CRI certificate – refresher training

1. Paragraph (c)(1) of FCL.940.CRI determine that an applicant for renewal of a CRI certificate shall complete refresher training as a CRI at an approved training organisation. Paragraph (a)(2) also establishes that an applicant for revalidation of the CRI certificate that has not completed a minimum amount of instruction hours [established in paragraph (a)(1)] during the validity period of the certificate shall undertake refresher training at an approved training organization for the revalidation of the certificate. The amount of refresher training needed should be determined on a case by case basis by the approved training organisation, taking into account the following factors:

    1.1 the experience of the applicant.

    1.2 whether the training is for revalidation or renewal;

    1.3 the amount of time lapsed since the last time the applicant has conducted training, in the case of revalidation, or since the certificate has lapsed, in the case of renewal. The amount of training needed to reach the desired level of competence should increase with the time lapsed.

2. Once the training organisation has determined the needs of the applicant, it should develop an individual training programme, that should be based on the CRI training course and focus on the aspects where the applicant has shown the greatest needs.

AMC No 1 to FCL.930.IRI

IRI Training course

GENERAL

1. The aim of the IRI course is to train aircraft licence holders to the level of competence defined in FCL.920, and adequate for a IRI.

CONTENT

~~1~~**2.** The IRI course should give particular stress to the role of the individual in relation to the importance of human factors in the man-machine environment. Special attention should be paid to the applicant’s levels of maturity and judgement including an understanding of adults, their behavioural attitudes and variable levels of education.

~~2~~**3.** With the exception of the section on Teaching and Learning, all the subject detail contained in the theoretical and Flight Training Syllabus is complementary to the Instrument Rating Pilot Course Syllabus which should already be known by the applicant. Therefore the objective of the course is to:

   a. refresh and bring up to date the technical knowledge of the student instructor;

   b. train pilots in accordance with the requirements of the modular instrument flying training course;

   c. enable the applicant to develop the necessary instructional techniques required for teaching of instrument flying, radio navigation and instrument procedures to the level required for the issue of an instrument rating; and

d. ensure that the student instrument rating instructor's flying is of a sufficiently high standard.

~~3~~**4.** Some of the air exercises in Part Three – Flight Training Syllabus of this AMC may be combined in the same flight.

~~4~~**5.** During the course, the applicants should be made aware of their own attitudes to the important aspect of flight safety. Improving safety awareness should be a fundamental objective throughout the course. It will be of major importance for the course of training to aim at giving applicants the knowledge, skills and attitudes relevant to an instructor's task and to achieve this, the course curriculum, in terms of objectives should comprise at least the following areas.

6. The course consists of 3 parts

- Part 1, **Teaching and Learning** that should follow the content of AMC to FCL.920**. The content of the teaching and learning Part of the LAFI course, as established in AMC to FCL.930.LAFI, may be used as guidance to develop the course syllabus.**
- Part 2 Instrument ~~Theoretical Knowledge~~**Technical** Training. The instrument theoretical knowledge instruction should comprise not less than 10 hours training to include the revision of instrument theoretical knowledge, the preparation of lesson plans and the development of classroom instructional skills to enable the IRI to instruct the instrument theoretical knowledge syllabus.
- Part 3, Flight Training. An approved IRI course should comprise of at least 10 hours of flight instruction**, of which a maximum of 8 hours may be conducted** in an ~~aircraft or~~ FSTD. A similar number of hours should be used for the instruction and practice of pre-flight and post-flight briefing for each exercise. The flight instruction should aim to ensure that the applicant is able to teach the air exercises safely and efficiently.

Parts 2 and 3 should comply with the following detailed content:

PART 2

THEORETICAL KNOWLEDGE INSTRUCTION SYLLABUS

7. All the subject detail contained in the theoretical and Flight Training Syllabus is complementary to the Instrument Rating Pilot Course syllabus which should already be known by the applicant. Therefore the objective of the course is to:

a. refresh and bring up to date the technical knowledge of the student instructor;

b. train pilots in accordance with the requirements of the modular instrument flying training course

c. enable the applicant to develop the necessary instructional techniques required for teaching of instrument flying, radio navigation and instrument procedures to the level required for the issue of an instrument rating; and

d. ensure that the student instrument rating instructor's flying is of a sufficiently high standard.

8. The theoretical subjects covered below should be used to develop the instructor's teaching skills. The items selected should relate to the student's background and should be applied to training for an IR.

GENERAL SUBJECTS

PHYSIOLOGICAL/PSYCHOLOGICAL FACTORS

The Senses

Spatial Disorientation

Sensory Illusions

Stress

FLIGHT INSTRUMENTS

Airspeed Indicator

Altimeter

Vertical Speed Indicator

Attitude Indicator

Heading Indicator

Turn and Slip Indicator

Magnetic Compass

In relation to the above instruments the following items should be covered:

Principles of Operation

Errors and in-flight Serviceability Checks

System Failures

RADIO NAVIGATION AIDS

Basic Radio Principles

Use of VHF RTF Channels

The Morse Code

Basic Principles of Radio Aids

VHF Omni Range (VOR)

Ground and Aeroplane Equipment

Non Directional Beacons (NDB/ADF)

Ground and Aeroplane Equipment

VHF Direction Finding (VHF/DF)

Radio Detection and Ranging (RADAR)

Ground Equipment

Primary Radar

Secondary Surveillance Radar

Aeroplane Equipment

Transponders

Precision Approach System

Other Navigational Systems (as applicable) in current Operational use

Ground and Aeroplane Equipment

Distance Measuring Equipment (DME)

Ground and Aeroplane Equipment

Marker Beacons

Ground and Aeroplane Equipment

Pre-flight Serviceability Checks

Range, Accuracy and Limitations of Equipment

FLIGHT PLANNING CONSIDERATIONS

AERONAUTICAL INFORMATION PUBLICATIONS

The course of training should cover the items listed below, but the applicant's aptitude and previous aviation experience should be taken into account when determining the amount of instructional time allotted.

Although a number of items contained under this heading are complementary to those contained in the PPL/CPL/IR syllabi, the instructor should ensure that they have been covered during the applicant's training and due allowance should be made for the time needed to revise these items as necessary.

The Aeronautical Information Publication

NOTAM Class 1 and 2

Aeronautical Information Circulars

Information of an Operational Nature

The Rules of the Air and Air Traffic Services (RAC)

Visual Flight Rules and Instrument Flight Rules

Flight Plans and ATS Messages

Use of Radar in Air Traffic Services

Radio Failure

Classification of Airspace

Airspace Restrictions and Hazards

Holding and Approach to Land Procedures

Precision Approaches/Non Precision Approaches

Radar Approach Procedures

Missed Approach Procedures

Visual Manoeuvring after an Instrument Approach

Conflict Hazards in Uncontrolled Airspace

Communications

Types of Services

Extraction of AIP Data Relating to Radio Aids

Charts Available

En-route

Departure and Arrival

Instrument Approach and Landing

Amendments, Corrections and Revision Service

FLIGHT PLANNING GENERAL

The Objectives of Flight Planning

Factors Affecting Aeroplane and Engine Performance

Selection of Alternate(s)

Obtaining Meteorological Information

Services Available

Met Briefing

Telephone or Electronic Data Processing

Actual Weather Reports (TAFs, METARs and SIGMET Messages)

The Route Forecast

The Operational Significance of the Meteorological Information Obtained (including Icing, Turbulence and Visibility)

Altimeter Considerations

Definitions of

Transition Altitude

Transition Level

Flight Level

QNH

Regional QNH

Standard Pressure Setting

QFE

Altimeter Setting Procedures

Pre-flight Altimeter Checks

Take off and Climb

En-Route

Approach and Landing

Missed Approach

Terrain Clearance

Selection of a Minimum Safe En-Route Altitude

Instrument Flight Rules

Preparation of Charts

Choice of Routes and Flight Levels

Compilation of Flight Plan/Log Sheet

Log Sheet Entries

Navigation Ground Aids to be used

Frequencies/Identification

Radials and Bearings

Tracks and Fixes

Safety Altitude(s)

Fuel Calculations

ATC Frequencies (VHF)

Tower, Approach, En-Route, Radar, FIS, ATIS, and Weather Reports

Minimum Sector Altitudes at Destination and Alternate Aerodromes

Determination of Minimum Safe Descent Heights/Altitudes (Decision Heights) at Destination and Alternate Aerodromes

THE PRIVILEGES OF THE INSTRUMENT RATING

Outside Controlled Airspace

Within Controlled Airspace

Period of Validity and Renewal Procedures

PART 3

FLIGHT TRAINING SYLLABUS

A. AEROPLANES

LONG BRIEFINGS AND AIR EXERCISES

~~1 Instrument Flying (For revision as deemed necessary by the Course Instructor)~~

~~2 Instrument Flying (Advanced)~~

~~3 Radio Navigation (Applied Procedures) – use of VOR~~

~~4 Radio Navigation (Applied Procedures) – use of NDB~~

~~5 Radio Navigation (Applied Procedures) – use of VHF/DF~~

~~6 Radio Navigation (Applied Procedures) – use of DME~~

~~7 Radio Navigation (Applied Procedures) – use of Transponders~~

~~8 Radio Navigation (Applied Procedures) – use of En-Route Radar Services~~

~~9 Pre-flight and Aerodrome Departure and Arrival Procedures~~

~~10 Instrument Approach – ILS Approaches to Specified Minima – Missed Approach Procedures~~

~~11 Instrument Approach – NDB Approaches to Specified Minima – Missed Approach Procedures~~

~~12 Radio Navigation (applied procedures) use of GPS (to be developed)~~

LONG BRIEFING 1 – INTRUMENT FLYING (Basic)

(for revision, as deemed necessary by the instructor)

INSTRUMENT FLYING (Basic)

Flight Instruments

Physiological Considerations

Instrument Appreciation

Attitude Instrument Flight

Pitch Indications

Bank Indications

Different Instrument Presentations

Introduction to the Use of the Attitude Indicator

Pitch Attitude

Bank Attitude

Maintenance of Heading and Balanced flight

Instrument Limitations (inc. System Failures)

ATTITUDE, POWER & PERFORMANCE

Attitude Instrument Flight

Control Instruments

Performance Instruments

Effect of Changing Power and configuration

Cross Checking the Instrument Indications

Instrument Interpretation

Direct and Indirect Indications (Performance Instruments)

Instrument Lag

Selective Radial Scan

THE BASIC FLIGHT MANOEUVRES (FULL PANEL)

Straight and Level Flight at Various Airspeeds and Aeroplane Configurations

Climbing

Descending

Standard Rate Turns

Level, Climbing and Descending On to Pre-Selected Headings

AIR EXERCISE 1

INSTRUMENT FLYING (Basic)

Physiological Sensations

Instrument Appreciation

Attitude Instrument Flight

Pitch Attitude

Bank Attitude

Maintenance of Heading and Balanced Flight

Attitude Instrument Flight

Effect of Changing Power and configuration

Cross Checking the Instruments

Selective Radial Scan

THE BASIC FLIGHT MANOEUVRES (FULL PANEL)

Straight and Level Flight at various Airspeeds and Aeroplane Configurations

Climbing

Descending

Standard Rate Turns

Level, Climbing and Descending on to Pre-Selected Headings

LONG BRIEFING 2 – INTRUMENT FLYING (Advanced)

INSTRUMENT FLYING (Advanced)

Full Panel

30ø Level Turns

Unusual Attitudes – Recoveries

Transference to Instruments after Take-off

Limited Panel

Basic Flight Manoeuvres

Unusual Attitudes – Recoveries

AIR EXERCISE 2

Full Panel

30ø Level Turns

Unusual Attitudes – Recoveries

Limited Panel

Repeat of the Above Exercises

LONG BRIEFING 3 - RADIO NAVIGATION (APPLIED PROCEDURES) - USE OF VOR

(VHF OMNI RANGE)

Availability of VOR Stations En-Route

Station Frequencies and Identification

Signal Reception Range

Effect of Altitude

VOR Radials

Use of Omni Bearing Selector

To/From Indicator

Orientation

Selecting Radials

Intercepting a Pre-Selected Radial

Assessment of Distance to Interception

Effects of Wind

Maintaining a Radial

Tracking To/From a VOR Station

Procedure Turns

Station Passage

Use of Two Stations for Obtaining a Fix

Pre-Selecting Fixes Along a Track

Assessment of Ground Speed and Timing

Holding Procedures

Various Entries

Communication (R/T Procedures and ATC Liaison)

AIR EXERCISE 3

RADIO NAVIGATION (APPLIED PROCEDURES)

USE OF VOR (VHF OMNI RANGE)

Station Selection and Identification

Orientation

Intercepting a Pre-Selected Radial

R/T Procedures and ATC Liaison

Maintaining a Radial Inbound

Recognition of Station Passage

Maintaining a Radial Outbound

Procedure Turns

Use of Two Stations to Obtain a Fix Along the Track

Assessment of Ground Speed and Timing

Holding Procedures/Entries

Holding at a Pre-Selected Fix

Holding at a VOR Station

LONG BRIEFING 4 - RADIO NAVIGATION (APPLIED PROCEDURES) – Use of NDB

USE OF ADF (AUTOMATIC DIRECTION FINDING EQUIPMENT)

Availability of NDB (Non Directional Beacons) Facilities En-Route

Location, Frequencies, Tuning (as applicable) and Identification Codes

Signal Reception Range

Static Interference

Night Effect

Station Interference

Mountain Effect

Coastal Refraction

Orientation in Relation to a NDB

Homing

Intercepting a Pre-Selected Magnetic Bearing and Tracking Inbound

Station Passage

Tracking Outbound

Time/Distance Checks

Use of Two NDBs to Obtain a Fix or alternatively use of One NDB and One other Navaid

Holding Procedures/Various Approved Entries

Communication (R/T Procedures and ATC Liaison)

AIR EXERCISE 4

RADIO NAVIGATION (APPLIED PROCEDURES)

USE OF ADF (AUTOMATIC DIRECTION FINDING EQUIPMENT)

Selecting, Tuning and Identifying a NDB

ADF Orientation

Communication (R/T Procedures and ATC Liaison)

Homing

Tracking Inbound

Station Passage

Tracking Outbound

Time/Distance Checks

Intercepting a Pre-Selected Magnetic Bearing

Determining the Aeroplane's position from Two NDBs or alternatively from One NDB and One Other Navaid

ADF Holding Procedures/Various Approved Entries

LONG BRIEFING 5 - RADIO NAVIGATION (APPLIED PROCEDURES) - USE OF VHF/DF (Very High Frequency/Direction Finding)

Availability of VHF/DF Facilities En-Route

Location, Frequencies, Station Call Signs and Hours of Operation

Signal and Reception Range

Effect of Altitude

Communication (R/T Procedures and ATC Liaison)

Obtaining and Using Types of Bearings, e.g. QTE, QDM, QDR

Homing to a Station

Effect of Wind

Use of Two VHF/DF Stations to Obtain a Fix (or alternatively One VHF/DF Station and One other Navaid)

Assessment of Groundspeed and Timing

AIR EXERCISE 5

RADIO NAVIGATION (APPLIED PROCEDURES)

USE OF VHF/DF (Very High Frequency/Direction Finding)

Establishing Contact with a VHF/DF Station

R/T Procedures and ATC Liaison

Obtaining and Using a QDR and QTE

Homing to a Station

Effect of Wind

Use of Two VHF/DF Stations to Obtain a Fix (or alternatively One VHF/DF Station and One other Navaid)

Assessment of Groundspeed and Timing

LONG BRIEFING 6 - RADIO NAVIGATION (APPLIED PROCEDURES) - USE OF DME (Distance Measuring Equipment)

Availability of DME Facilities

Location, Frequencies and Identification Codes

Signal Reception Range

Slant Range

Use of DME to obtain Distance, Groundspeed and Timing

Use of DME to obtain a Fix

AIR EXERCISE 6

USE OF DME (Distance Measuring Equipment)

Station Selection and Identification

Use of Equipment Functions

Distance

Groundspeed

Timing

DME Arc Approach

DME Holding

LONG BRIEFING 7 - RADIO NAVIGATION (APPLIED PROCEDURES) - USE OF TRANSPONDERS (SSR)

Operation of Transponders

Code Selection Procedure

Emergency Codes

Precautions when using Airborne Equipment

AIR EXERCISE 7

USE OF TRANSPONDERS (SSR)

Operation of Transponders

Types of Transponders

Code Selection Procedure

Emergency Codes

Precautions when Selecting the Required Code

LONG BRIEFING 8 - RADIO NAVIGATION (APPLIED PROCEDURES) - USE OF EN-ROUTE RADAR

Availability of Radar Services

Location, Station Frequencies, Call Signs and Hours of Operation

AIP and NOTAMs

Provision of Service

Communication (R/T, Procedures and ATC Liaison)

Airspace Radar Advisory Service

Emergency Service

Aircraft Separation Standards

AIR EXERCISE 8

USE OF EN-ROUTE RADAR

Communication (R/T Procedures and ATC Liaison)

Establishing the Service Required and Position Reporting

Method of Reporting Conflicting Traffic

Terrain Clearance

LONG BRIEFING 9 - PRE-FLIGHT AND AERODROME DEPARTURE AND ARRIVAL PORCESURES

Determining the Serviceability of the Aeroplane Radio

Navigation Equipment

Obtaining the Departure Clearance

Setting up Radio Navaids prior to Take-off e.g. VOR Frequencies, Required Radials, etc.

Aerodrome Departure Procedures, Frequency Changes

Altitude and Position Reporting as Required

Standard Instrument Departure Procedures (SIDs)

Obstacle Clearance Considerations

AIR EXERCISE 9

PRE-FLIGHT AND AERODROME DEPARTURE

Radio Equipment Serviceability Checks

Departure Clearance

Navaid Selection

Frequencies, Radials, etc.

Aerodrome Departure Checks, Frequency Changes, Altitude and Position Reports

Standard Instrument Departure Procedures (SIDs)

LONG BRIEFING 10 – INSTRUMENT APPORACH - ILS APPROACHES TO SPECIFIED MINIMA - MISSED APPROACH PROCEDURE

INITIAL/INTERMEDIATE/FINAL APPROACH PROCEDURES

Precision Approach Charts

Approach to the Initial Approach Fix and Minimum Sector Altitude

Navaid Requirements, e.g. Radar, ADF, etc.

Communication (ATC Liaison and R/T Phraseology)

Review:

Holding Procedure

The Final Approach Track

Forming a Mental Picture of the Approach

Completion of Aerodrome Approach Checks

Initial Approach Procedure

Selection of the ILS Frequency and Identification

Obstacle Clearance Altitude/Height

Operating Minima

Achieving the Horizontal and Vertical Patterns

Assessment of Distance, Groundspeed Time, and Rate of Descent from the Final Approach Fix to the Aerodrome

Use of DME (as applicable)

Go Around and Missed Approach Procedure

Review of the Published Instructions

Transition from Instrument to Visual Flight (Sensory Illusions)

VISUAL MANOEUVRING AFTER AN INSTRUMENT APPROACH

Circling Approach

Visual Approach to Landing

AIR EXERCISE 10

PRECISION APPROACH PROCEDURE

Initial Approach to the ILS

Completion of Approach Planning

Holding Procedure

Frequency Selection and Identification of ILS

Review of the Published Procedure and Minimum Sector Altitude

Communication (ATC Liaison and R/T Phraseology)

Determination of Operating Minima and Altimeter Setting

Weather Consideration, e.g. Cloud Base and Visibility

Availability of Runway Lighting

ILS Entry Methods

Radar Vectors

Procedural Method

Assessment of Approach Time from the Final Approach Fix to the Aerodrome

Determination of:

The Descent Rate on Final Approach

The Wind Velocity at the Surface and the Length of the Landing Runway

The Obstruction Heights to be borne in mind during Visual manoeuvring after an Instrument Approach

Circling approach

The Approach:

At the Final Approach Fix

Use of DME (as applicable)

ATC liaison

Note Time and establish Airspeed and Descent Rate

Maintaining the Localiser and Glide Path

Anticipation in Change of Wind Velocity and its Effect on Drift

Decision Height

Runway Direction

Overshoot and Missed Approach Procedure

Transition from Instrument to Visual Flight

Circling Approach

Visual Approach to Landing

LONG BRIEFING 11 – INSTRUMENTS APPROACH - NDB APPROACHES TO SPECIFIED MINIMA - MISSED APPROACH PROCEDURES

NON-PRECISION APPROACH PROCEDURE

Non-Precision Approach Charts

Initial Approach to the Initial Approach Fix and Minimum Sector Altitude

ATC Liaison

Communication (ATC Procedures and R/T Phraseology)

Approach Planning:

Holding Procedure

The Approach Track

Forming a Mental Picture of the Approach

Initial Approach Procedure

Operating Minima

Completion of Approach Planning

Achieving the Horizontal and Vertical Patterns

Assessment of Distance, Groundspeed Time, and Rate of Descent from the Final Approach Fix (FAF) to the Aerodrome

Use of DME (as applicable)

Go around and Missed Approach Procedure

Review of the Published Instructions

Transition from Instrument to Visual Flight (Sensory Illusions)

Visual Manoeuvring after an Instrument Approach

Circling Approach

Visual Approach to Landing

AIR EXERCISE 11

NON-PRECISION APPROACH PROCEDURE

Completion of Approach Planning including

Determination of:

Descent Rate from the Final Approach Fix

The Wind Velocity at the Surface and Length of the Landing Runway

The Obstruction Heights to be Borne in Mind During Visual Manoeuvring after an Instrument Approach

Circling Approach

Go Around and Missed Approach Procedure

Initial Approach

Frequency Selection and Identification

Review of the Published Procedure and Minimum Safe Sector Altitude

ATC liaison and R/T Phraseology

Determination of Decision Height and Altimeter Setting

Weather Considerations, e.g. Cloud Base and Visibility

Availability of Runway Lighting

Determination of Inbound Track

Assessment of Time from Final Approach Fix to the Missed Approach Point

ATC Liaison

The Outbound Procedure (incl. Completion of Pre-Landing Checks)

The Inbound Procedure

Re-Check of Identification Code

Altimeter Setting Re-Checked

The Final Approach

Note Time and Establish Airspeed and Descent Rate

Maintaining the Final Approach Track

Anticipation of Change in Wind Velocity and its Effect on the Drift

Minimum Descent Altitude/Height

Runway Direction

Go around and Missed Approach Procedure

Transition from Instrument to Visual Flight (Sensory Illusions)

Visual Approach

LONG BRIEFING 12 - RADIO NAVIGATION -APPLIED PROCEDURES - USE OF GPS

~~AIR EXERCISES~~

Use of GPS (to be developed)

B. HELICOPTERS

LONG BRIEFINGS AND AIR EXERCISES

~~1 Instrument Flying (For revision as deemed necessary by the Course Instructor)~~

~~2 Instrument Flying (Advanced)~~

~~3 Radio Navigation (Applied Procedures) – use of VOR~~

~~4 Radio Navigation (Applied Procedures) – use of NDB~~

~~5 Radio Navigation (Applied Procedures) – use of VHF/DF~~

~~6 Radio Navigation (Applied Procedures) – use of DME~~

~~7 Radio Navigation (Applied Procedures) – use of Transponders~~

~~8 Radio Navigation (Applied Procedures) – use of En-Route Radar Services~~

~~9 Pre-Flight and Aerodrome Departure and Arrival Procedures~~

~~10 Instrument Approach – precision approach aid to Specified Minima- Missed Approach Procedures~~

~~11 Instrument Approach – non-precision approach to Specified Minima- Missed Approach Procedures~~

~~12 Radio navigation (Applied Procedures) – use of GPS (to be developed)~~

LONG BRIEFING 1 - INSTRUMENT FLYING (Basic)

(for revision as deemed necessary by the instructor)

Flight Instruments

Physiological Considerations

Instrument Appreciation

- Attitude Instrument Flight
- Pitch Indications
- Bank Indications
- Different Instrument Presentations
- Introduction to the Use of the Attitude Indicator
- Pitch Attitude
- Bank Attitude
- Maintenance of Heading and Balanced flight
- Instrument Limitations (inc System Failures)

ATTITUDE, POWER & PERFORMANCE

Attitude Instrument Flight

Control Instruments

Performance Instruments
Effect of Changing Power
Cross Checking the Instrument Indications
Instrument Interpretation
Direct and Indirect Indications (Performance Instruments)
Instrument Lag
Selective Radial Scan
THE BASIC FLIGHT MANOEUVRES (FULL PANEL)
Straight and Level Flight at Various Airspeeds
Climbing
Descending
Standard Rate Turns
Level, Climbing and Descending On to Pre-Selected Headings
AIR EXERCISE 1
INSTRUMENT FLYING (Basic)
Physiological Sensations
Instrument Appreciation
Attitude Instrument Flight
Pitch Attitude
Bank Attitude
Maintenance of Heading and Balanced Flight
Attitude Instrument Flight
Effect of Changing Power
Cross Checking the Instruments
Selective Radial Scan
THE BASIC FLIGHT MANOEUVRES (FULL PANEL)
Straight and Level Flight at various Airspeeds and Helicopter Configurations
Climbing
Descending
Standard Rate Turns
Level, Climbing and Descending on to Pre-Selected Headings
[Manoeuvring at minimum and maximum IMC speed]

LONG BRIEFING 2 - INSTRUMENT FLYING (Advanced)

Full Panel

30 degrees Level Turns

Unusual Attitudes – Recoveries

Transition to Instruments after Take-off

Limited Panel

Basic Flight Manoeuvres

Unusual Attitudes – Recoveries

AIR EXERCISE 2

Full Panel

30 degrees Level Turns

Unusual Attitudes – Recoveries

Identification and Recovery from Low Pitch Steep Bank and High Pitch Steep Bank Attitudes (at low and high power settings)

Limited Panel

Repeat of the Above Exercises

LONG BRIEFING 3 RADIO NAVIGATION (APPLIED PROCEDURES) – USE OF VOR

USE OF VOR (VHF OMNI RANGE)

Availability of VOR Stations En-Route

Station Frequencies and Identification

Signal Reception Range

Effect of Altitude

VOR Radials

Use of Omni Bearing Selector

To/From Indicator

Orientation

Selecting Radials

Intercepting a Pre-Selected Radial

Assessment of Distance to Interception

Effects of Wind

Maintaining a Radial

Tracking To/From a VOR Station

Procedure Turns

Station Passage

Use of Two Stations for Obtaining a Fix

Pre-Selecting Fixes Along a Track

Assessment of Ground Speed and Timing

Holding Procedures

Various Entries

Communication (R/T Procedures and ATC Liaison)

AIR EXERCISE 3

RADIO NAVIGATION (APPLIED PROCEDURES)

USE OF VOR (VHF OMNI RANGE)

Station Selection and Identification

Orientation

Intercepting a Pre-Selected Radial

R/T Procedures and ATC Liaison

Maintaining a Radial Inbound

Recognition of Station Passage

Maintaining a Radial Outbound

Procedure Turns

Use of Two Stations to Obtain a Fix Along the Track

Assessment of Ground Speed and Timing

Holding Procedures/Entries

Holding at a Pre-Selected Fix

Holding at a VOR Station

LONG BRIEFING 4 - RADIO NAVIGATION (APPLIED PROCEDURES) – USE OF NDB

USE OF ADF (AUTOMATIC DIRECTION FINDING EQUIPMENT)

Availability of NDB (Non Directional Beacons) Facilities En-Route

Location, Frequencies, Tuning (as applicable) and Identification Codes

Signal Reception Range

Static Interference

Night Effect

Station Interference

Mountain Effect

Coastal Refraction

Orientation in Relation to a NDB

Homing

Intercepting a Pre-Selected Magnetic Bearing and Tracking Inbound

Station Passage

Tracking Outbound

Time/Distance Checks

Use of Two NDBs to Obtain a Fix or alternatively use of One NDB and One other Navaid

Holding Procedures

Communication (R/T Procedures and ATC Liaison)

AIR EXERCISE 4

RADIO NAVIGATION (APPLIED PROCEDURES)

USE OF ADF (AUTOMATIC DIRECTION FINDING EQUIPMENT)

Selecting, Tuning and Identifying a NDB

ADF Orientation

Communication (R/T Procedures and ATC Liaison)

Homing

Tracking Inbound

Station Passage

Tracking Outbound

Time/Distance Checks

Intercepting a Pre-Selected Magnetic Bearing

Determining the Helicopter’s position from Two NDBs or alternatively from One NDB and One Other Navaid

ADF Holding Procedures

LONG BRIEFING 5 - RADIO NAVIGATION (APPLIED PROCEDURES) - USE OF VHF/DF

USE OF VHF/DF (Very High Frequency/Direction Finding)

Availability of VHF/DF Facilities En-Route

Location, Frequencies, Station Call Signs and Hours of Operation

Signal and Reception Range

Effect of Altitude

Communication (R/T Procedures and ATC Liaison)

Obtaining and Using Types of Bearings, e.g. QTE, QDM, QDR

Homing to a Station

Effect of Wind

Use of Two VHF/DF Stations to Obtain a Fix (or alternatively One VHF/DF Station and One other Navaid)

Assessment of Groundspeed and Timing

AIR EXERCISE 5

RADIO NAVIGATION (APPLIED PROCEDURES)

USE OF VHF/DF (Very High Frequency/Direction Finding)

Establishing Contact with a VHF/DF Station

R/T Procedures and ATC Liaison

Obtaining and Using a QDR and QTE

Homing to a Station

Effect of Wind

Use of Two VHF/DF Stations to Obtain a Fix (or alternatively One VHF/DF Station and One other Navaid)

Assessment of Groundspeed and Timing

LONG BRIEFING 6 - RADIO NAVIGATION (APPLIED PROCEDURES) - USE OF DME

USE OF DME (Distance Measuring Equipment)

Availability of DME Facilities

Location, Frequencies and Identification Codes

Signal Reception Range

Slant Range

Use of DME to obtain Distance, Groundspeed and Timing

Use of DME to obtain a Fix

AIR EXERCISE 6

USE OF DME (Distance Measuring Equipment)

Station Selection and Identification

Use of Equipment Functions

Distance

Groundspeed

Timing

DME Arc Approach

DME Holding

LONG BRIEFING 7 - RADIO NAVIGATION (APPLIED PROCEDURES) - USE OF TRANSPONDERS

USE OF TRANSPONDERS (SSR)

Operation of Transponders

Code Selection Procedure

Emergency Codes

Precautions when using Airborne Equipment

AIR EXERCISE 7

USE OF TRANSPONDERS (SSR)

Operation of Transponders

Types of Transponders

Code Selection Procedure

Emergency Codes

Precautions when Selecting the Required Code

LONG BRIEFING 8 - - RADIO NAVIGATION (APPLIED PROCEDURES) - USE OF EN-ROUTE RADAR SERVICES

USE OF EN-ROUTE RADAR

Availability of Radar Services

Location, Station Frequencies, Call Signs and Hours of Operation

AIP and NOTAMS

Provision of Service

Communication (R/T, Procedures and ATC Liaison)

Airspace Radar Advisory Service

Emergency Service

Aircraft Separation Standards

AIR EXERCISE 8

USE OF EN-ROUTE RADAR

Communication (R/T Procedures and ATC Liaison)

Establishing the Service Required and Position Reporting

Method of Reporting Conflicting Traffic

Terrain Clearance

LONG BRIEFING 9 - PRE-FLIGHT AND AERODROME DEPARTURE AND ARRIVAL POOCEDURES

PRE-FLIGHT AND AERODROME DEPARTURE

Determining the Serviceability of the Radio equipment

Navigation Equipment

Obtaining the Departure Clearance

Setting up Radio Navaids prior to Take-off e.g. VOR Frequencies, Required Radials, etc

Aerodrome Departure Procedures, Frequency Changes

Altitude and Position Reporting as Required

Standard Instrument Departure Procedures (SIDs)

Obstacle Clearance Considerations

AIR EXERCISE 9

PRE-FLIGHT AND AERODROME DEPARTURE

Radio Equipment Serviceability Checks

Departure Clearance

Navaid Selection

Frequencies, Radials, etc

Aerodrome Departure Checks, Frequency Changes, Altitude and Position Reports

Standard Instrument Departure Procedures (SIDs)

LONG BRIEFING 10 – INSTRUMENT APPROACH - PRECISION APPROACH AID TO SPECIFIED MINIMA - MISSED APPROACH PROCEDURES

INITIAL/INTERMEDIATE/FINAL APPROACH PROCEDURES

Precision Approach Charts

Approach to the Initial Approach Fix and Minimum Sector Altitude

Navaid Requirements, e.g. Radar, ADF, etc

Communication (ATC Liaison and R/T Phraseology)

Review:

Holding Procedure

The Final Approach Track

Forming a Mental Picture of the Approach

Completion of Aerodrome Approach Checks

Initial Approach Procedure

Selection of the ILS Frequency and Identification

Obstacle Clearance Altitude/Height

Operating Minima

Achieving the Horizontal and Vertical Patterns

Assessment of Distance, Groundspeed Time, and Rate of Descent from the Final Approach Fix to the Aerodrome

Use of DME (as applicable)

Go Around and Missed Approach Procedure

Review of the Published Instructions

Transition from Instrument to Visual Flight (Sensory Illusions)

VISUAL MANOEUVRING AFTER AN INSTRUMENT APPROACH

Circling Approach

Visual Approach to Landing

AIR EXERCISE 10

PRECISION APPROACH PROCEDURE

Initial Approach to the ILS

Completion of Approach Planning

Holding Procedure

Frequency Selection and Identification of ILS

Review of the Published Procedure and Minimum Sector Altitude

Communication (ATC Liaison and R/T Phraseology)

Determination of Operating Minima and Altimeter Setting

Weather Consideration, e.g. Cloud Base and Visibility

Availability of Landing site Lighting

ILS Entry Methods

Radar Vectors

Procedural Method

Assessment of Approach Time from the Final Approach Fix to the Aerodrome

Determination of:

The Descent Rate on Final Approach

The Wind Velocity at the Surface and the Length of the Landing Site

The Obstruction Heights to be borne in mind during Visual manoeuvring after an Instrument Approach

Circling approach

The Approach:

At the Final Approach Fix

Use of DME (as applicable)

ATC liaison

Note Time and establish Airspeed and Descent Rate

Maintaining the Localizer and Glide Path

Anticipation in Change of Wind Velocity and its Effect on Drift

Decision Height

Landing Direction

Go Around and Missed Approach Procedure

Transition from Instrument to Visual Flight

Circling Approach

Visual Approach to Landing

LONG BRIEFING 11 – INSTRUMENT APPROACH – NON -PRECISION APPROACH TO SPECIFIED MINIMA - MISSED APPROACH PROCEDURES

NON-PRECISION APPROACH PROCEDURE

Non-Precision Approach Charts

Initial Approach to the Initial Approach Fix and Minimum Sector Altitude

ATC Liaison

Communication (ATC Procedures and R/T Phraseology)

Approach Planning:

Holding Procedure

The Approach Track

Forming a Mental Picture of the Approach

Initial Approach Procedure

Operating Minima

Completion of Approach Planning

Achieving the Horizontal and Vertical Patterns

Assessment of Distance, Groundspeed Time, and Rate of Descent from the Final Approach Fix (FAF) to the Aerodrome

Use of DME (as applicable)

Go Around and Missed Approach Procedure

Review of the Published Instructions

Transition from Instrument to Visual Flight (Sensory Illusions)

Visual Manoeuvring after an Instrument Approach

Circling Approach

Visual Approach to Landing

AIR EXERCISE 11

NON-PRECISION APPROACH PROCEDURE

Completion of Approach Planning including

Determination of:

Descent Rate from the Final Approach Fix

The Wind Velocity at the Surface and Length of the Landing site

The Obstruction Heights to be Borne in Mind During Visual Manoeuvring after an Instrument Approach

Circling Approach

Go Around and Missed Approach Procedure

Initial Approach

Frequency Selection and Identification

Review of the Published Procedure and Minimum Safe Sector Altitude

ATC liaison and R/T Phraseology

Determination of Decision Height and Altimeter Setting

Weather Considerations, e.g. Cloud Base and Visibility

Availability of Landing site Lighting

Determination of Inbound Track

Assessment of Time from Final Approach Fix to the Missed Approach Point

ATC Liaison

The Outbound Procedure (incl. Completion of Pre-Landing Checks)

The Inbound Procedure

Re-Check of Identification Code

Altimeter Setting Re-Checked

The Final Approach

Note Time and Establish Airspeed and Descent Rate

Maintaining the Final Approach Track

Anticipation of Change in Wind Velocity and its Effect on the Drift

Minimum Descent Altitude/Height

Landing site Direction

Go Around and Missed Approach Procedure

Transition from Instrument to Visual Flight (Sensory Illusions)

Visual Approach

LONG BRIEFING 12 – USE OF GPS

AIR EXERCISES

Use of GPS (to be developed)

C. AIRSHIPS

LONG BRIEFINGS AND AIR EXERCISES

~~1 Basic Instrument Flying (For revision as deemed necessary by the Course Instructor)~~

~~2 Instrument Flying (Advanced)~~

~~3 Radio Navigation (Applied Procedures) – use of VOR~~

~~4 Radio Navigation (Applied Procedures) – use of NDB~~

~~5 Radio Navigation (Applied Procedures) – use of VHF/DF~~

~~6 Radio Navigation (Applied Procedures) – use of DME~~

~~7 Radio Navigation (Applied Procedures) – use of Transponders~~

~~8 Radio Navigation (Applied Procedures) – use of En-Route Radar Services~~

~~9 Pre-flight and Aerodrome Departure and Arrival Procedures~~

~~10 Instrument Approaches~~

~~ILS Approaches to Specified Minima – Missed Approach Procedures~~

~~11 Instrument Approaches~~

~~NDB Approaches to Specified Minima – Missed Approach Procedures~~

~~12 Radio Navigation (applied procedures) use of GPS (to be developed)~~

LONG BRIEFING 1 - INSTRUMENT FLYING (Basic)

(for revision as deemed necessary by the instructor)

Flight Instruments

Physiological Considerations

Instrument Appreciation

Attitude Instrument Flight

Pitch Indications

Different Instrument Presentations

Introduction to the Use of the Attitude Indicator

Pitch Attitude

Maintenance of Heading and Balanced flight

Instrument Limitations (inc. System Failures)

ATTITUDE, POWER & PERFORMANCE

Attitude Instrument Flight

Control Instruments

Performance Instruments

Effect of Changing Power, Trim and configuration

Cross Checking the Instrument Indications

Instrument Interpretation

Direct and Indirect Indications (Performance Instruments)

Instrument Lag

Selective Radial Scan

THE BASIC FLIGHT MANOEUVRES (FULL PANEL)

Straight and Level Flight at Various Airspeeds and Airship Configurations

Climbing

Descending

Standard Rate Turns

Level, Climbing and Descending On to Pre-Selected Headings

AIR EXERCISE 1

INSTRUMENT FLYING (Basic)

Physiological Sensations

Instrument Appreciation

Attitude Instrument Flight

Pitch Attitude

Bank Attitude

Maintenance of Heading and Balanced Flight

Attitude Instrument Flight

Effect of Changing Power and configuration

Cross Checking the Instruments

Selective Radial Scan

THE BASIC FLIGHT MANOEUVRES (FULL PANEL)

Straight and Level Flight at various Airspeeds and Airship Configurations

Climbing

Descending

Standard Rate Turns

Level, Climbing and Descending on to Pre-Selected Headings

LONG BRIEFING 2 - INSTRUMENT FLYING (Advanced)

Full Panel

Unusual Attitudes – Recoveries

Transference to Instruments after Take-off

Limited Panel

Basic Flight Manoeuvres

Unusual Attitudes – Recoveries

AIR EXERCISE 2

Full Panel

Unusual Attitudes – Recoveries

Limited Panel

Repeat of the Above Exercises

LONG BRIEFING 3 - RADIO NAVIGATION (APPLIED PROCEDURES) USE OF VOR

(VHF OMNI RANGE)

Availability of VOR Stations En-Route

Station Frequencies and Identification

Signal Reception Range

Effect of Altitude

VOR Radials

Use of Omni Bearing Selector

To/From Indicator

Orientation

Selecting Radials

Intercepting a Pre-Selected Radial

Assessment of Distance to Interception

Effects of Wind

Maintaining a Radial

Tracking To/From a VOR Station

Procedure Turns

Station Passage

Use of Two Stations for Obtaining a Fix

Pre-Selecting Fixes Along a Track

Assessment of Ground Speed and Timing

Holding Procedures

Various Entries

Communication (R/T Procedures and ATC Liaison)

AIR EXERCISE 3

RADIO NAVIGATION (APPLIED PROCEDURES)

USE OF VOR (VHF OMNI RANGE)

Station Selection and Identification

Orientation

Intercepting a Pre-Selected Radial

R/T Procedures and ATC Liaison

Maintaining a Radial Inbound

Recognition of Station Passage

Maintaining a Radial Outbound

Procedure Turns

Use of Two Stations to Obtain a Fix Along the Track

Assessment of Ground Speed and Timing

Holding Procedures/Entries

Holding at a Pre-Selected Fix

Holding at a VOR Station

LONG BRIEFING 4 - RADIO NAVIGATION (APPLIED PROCEDURES) - USE OF ADF

(AUTOMATIC DIRECTION FINDING EQUIPMENT)

Availability of NDB (Non Directional Beacons) Facilities En-Route

Location, Frequencies, Tuning (as applicable) and Identification Codes

Signal Reception Range

Static Interference

Night Effect

Station Interference

Mountain Effect

Coastal Refraction

Orientation in Relation to a NDB

Homing

Intercepting a Pre-Selected Magnetic Bearing and Tracking Inbound

Station Passage

Tracking Outbound

Time/Distance Checks

Use of Two NDBs to Obtain a Fix or alternatively use of One NDB and One other Navaid

Holding Procedures/Various Approved Entries

Communication (R/T Procedures and ATC Liaison)

AIR EXERCISE 4

RADIO NAVIGATION (APPLIED PROCEDURES)

USE OF ADF (AUTOMATIC DIRECTION FINDING EQUIPMENT)

Selecting, Tuning and Identifying a NDB

ADF Orientation

Communication (R/T Procedures and ATC Liaison)

Homing

Tracking Inbound

Station Passage

Tracking Outbound

Time/Distance Checks

Intercepting a Pre-Selected Magnetic Bearing

Determining the Airship’s position from Two NDBs or alternatively from One NDB and One Other Navaid

ADF Holding Procedures/Various Approved Entries

LONG BRIEFING 5 - RADIO NAVIGATION (APPLIED PROCEDURES) - USE OF VHF/DF

(Very High Frequency/Direction Finding)

Availability of VHF/DF Facilities En-Route

Location, Frequencies, Station Call Signs and Hours of Operation

Signal and Reception Range

Effect of Altitude

Communication (R/T Procedures and ATC Liaison)

Obtaining and Using Types of Bearings, e.g. QTE, QDM, QDR

Homing to a Station

Effect of Wind

Use of Two VHF/DF Stations to Obtain a Fix (or alternatively One VHF/DF Station and One other Navaid)

Assessment of Groundspeed and Timing

AIR EXERCISE 5

RADIO NAVIGATION (APPLIED PROCEDURES)

USE OF VHF/DF (Very High Frequency/Direction Finding)

Establishing Contact with a VHF/DF Station

R/T Procedures and ATC Liaison

Obtaining and Using a QDR and QTE

Homing to a Station

Effect of Wind

Use of Two VHF/DF Stations to Obtain a Fix (or alternatively One VHF/DF Station and One other Navaid)

Assessment of Groundspeed and Timing

LONG BRIEFING 6 – RADIO NAVIGATION - APPLIED PROCEDURES - USE OF DME

USE OF DME (Distance Measuring Equipment)

Availability of DME Facilities

Location, Frequencies and Identification Codes

Signal Reception Range

Slant Range

Use of DME to obtain Distance, Groundspeed and Timing

Use of DME to obtain a Fix

AIR EXERCISE 6

USE OF DME (Distance Measuring Equipment)

Station Selection and Identification

Use of Equipment Functions

Distance

Groundspeed

Timing

DME Arc Approach

DME Holding

LONG BRIEFING 7– RADIO NAVIGATION - APPLIED PROCEDURES - USE OF TRANSPONDERS

USE OF TRANSPONDERS (SSR)

Operation of Transponders

Code Selection Procedure

Emergency Codes

Precautions when using Airborne Equipment

AIR EXERCISE 7

USE OF TRANSPONDERS (SSR)

Operation of Transponders

Types of Transponders

Code Selection Procedure

Emergency Codes

Precautions when Selecting the Required Code

LONG BRIEFING 8 – RADIO NAVIGATION - APPLIED PROCEDURES - USE OF EN-ROUTE RADAR SERVICES

USE OF EN-ROUTE RADAR

Availability of Radar Services

Location, Station Frequencies, Call Signs and Hours of Operation

AIP and NOTAMs

Provision of Service

Communication (R/T, Procedures and ATC Liaison)

Airspace Radar Advisory Service

Emergency Service

Aircraft Separation Standards

AIR EXERCISE 8

USE OF EN-ROUTE RADAR

Communication (R/T Procedures and ATC Liaison)

Establishing the Service Required and Position Reporting

Method of Reporting Conflicting Traffic

Terrain Clearance

LONG BRIEFING 9 - PRE-FLIGHT AND AERODROME DEPARTURE AND ARRIVAL PROCEDURES

Determining the Serviceability of the Airship Radio

Navigation Equipment

Obtaining the Departure Clearance

Setting up Radio Navaids prior to Take-off e.g. VOR Frequencies, Required Radials, etc.

Aerodrome Departure Procedures, Frequency Changes

Altitude and Position Reporting as Required

Standard Instrument Departure Procedures (SIDs)

Obstacle Clearance Considerations

AIR EXERCISE 9

PRE-FLIGHT AND AERODROME DEPARTURE

Radio Equipment Serviceability Checks

Departure Clearance

Navaid Selection

Frequencies, Radials, etc.

Aerodrome Departure Checks, Frequency Changes, Altitude and Position Reports

Standard Instrument Departure Procedures (SIDs)

LONG BRIEFING 10 – INSTRUMENT APPROACHES - ILS APPROACHES TO SPECIFIED MINIMA - MISSED APPROACHES PROCEDURES

INITIAL/INTERMEDIATE/FINAL APPROACH PROCEDURES

Precision Approach Charts

Approach to the Initial Approach Fix and Minimum Sector Altitude

Navaid Requirements, e.g. Radar, ADF, etc.

Communication (ATC Liaison and R/T Phraseology)

Review:

Holding Procedure

The Final Approach Track

Forming a Mental Picture of the Approach

Completion of Aerodrome Approach Checks

Initial Approach Procedure

Selection of the ILS Frequency and Identification

Obstacle Clearance Altitude/Height

Operating Minima

Achieving the Horizontal and Vertical Patterns

Assessment of Distance, Groundspeed Time, and Rate of Descent from the Final Approach Fix to the Aerodrome

Use of DME (as applicable)

Go Around and Missed Approach Procedure

Review of the Published Instructions

Transition from Instrument to Visual Flight (Sensory Illusions)

VISUAL MANOEUVRING AFTER AN INSTRUMENT APPROACH

Circling Approach

Visual Approach to Landing

AIR EXERCISE 10

PRECISION APPROACH PROCEDURE

Initial Approach to the ILS

Completion of Approach Planning

Holding Procedure

Frequency Selection and Identification of ILS

Review of the Published Procedure and Minimum Sector Altitude

Communication (ATC Liaison and R/T Phraseology)

Determination of Operating Minima and Altimeter Setting

Weather Consideration, e.g. Cloud Base and Visibility

Availability of Runway Lighting

ILS Entry Methods

Radar Vectors

Procedural Method

Assessment of Approach Time from the Final Approach Fix to the Aerodrome

Determination of:

The Descent Rate on Final Approach

The Wind Velocity at the Surface (and the Length of the Landing Runway)

The Obstruction Heights to be borne in mind during Visual manoeuvring after an Instrument Approach

Circling approach

The Approach:

At the Final Approach Fix

Use of DME (as applicable)

ATC liaison

Note Time and establish Airspeed and Descent Rate

Maintaining the Localiser and Glide Path

Anticipation in Change of Wind Velocity and its Effect on Drift

Decision Height

Runway Direction

Missed Approach Procedure

Transition from Instrument to Visual Flight

Circling Approach

Visual Approach to Landing

LONG BRIEFING 11 – INSTRUMENT APPROCHES - NDB APPROACHES TO SPECIFIED MINIMA - MISSED APPROCHES PROCEDURE

NON-PRECISION APPROACH PROCEDURE

Non-Precision Approach Charts

Initial Approach to the Initial Approach Fix and Minimum Sector Altitude

ATC Liaison

Communication (ATC Procedures and R/T Phraseology)

Approach Planning:

Holding Procedure

The Approach Track

Forming a Mental Picture of the Approach

Initial Approach Procedure

Operating Minima

Completion of Approach Planning

Achieving the Horizontal and Vertical Patterns

Assessment of Distance, Groundspeed Time, and Rate of Descent from the Final Approach Fix (FAF) to the Aerodrome

Use of DME (as applicable)

Go around and Missed Approach Procedure

Review of the Published Instructions

Transition from Instrument to Visual Flight (Sensory Illusions)

Visual Manoeuvring after an Instrument Approach

Circling Approach

Visual Approach to Landing

AIR EXERCISE 11

NON-PRECISION APPROACH PROCEDURE

Completion of Approach Planning including

Determination of:

Descent Rate from the Final Approach Fix

The Wind Velocity at the Surface and Length of the Landing Runway

The Obstruction Heights to be Borne in Mind During Visual Manoeuvring after an Instrument Approach

Circling Approach

Go Around and Missed Approach Procedure

Initial Approach

Frequency Selection and Identification

Review of the Published Procedure and Minimum Safe Sector Altitude

ATC liaison and R/T Phraseology

Determination of Decision Height and Altimeter Setting

Weather Considerations, e.g. Cloud Base and Visibility

Availability of Runway Lighting

Determination of Inbound Track

Assessment of Time from Final Approach Fix to the Missed Approach Point

ATC Liaison

The Outbound Procedure (incl. Completion of Pre-Landing Checks)

The Inbound Procedure

Re-Check of Identification Code

Altimeter Setting Re-Checked

The Final Approach

Note Time and Descent Rate

Maintaining the Final Approach Track

Anticipation of Change in Wind Velocity and its Effect on the Drift

Minimum Descent Altitude/Height

Runway Direction

Go around and Missed Approach Procedure

Transition from Instrument to Visual Flight (Sensory Illusions)

Visual Approach

LONG BRIEFING 12 – RADIO NAVIGATION - APPLIED PROCEDURES - USE OF GPS

AIR EXERCISES

Use of GPS (to be developed)

AMC to FCL.930.MCCI

MCCI training course - aeroplanes

GENERAL

1. The objective of the technical training is to apply the core instructor competencies acquired during the ~~theoretical knowledge~~**teaching and learning** training to MCC training.

2. During the practical training the applicant should demonstrate the ability to instruct a pilot in MCC.

3. For the purpose of supervising applicants for MCCI certificates, the adequate experience should include at least 3 type rating or MCC courses.

COURSE OBJECTIVE

4.~~1~~ The course should be designed to give adequate training to the applicant in theoretical knowledge instruction and synthetic flight instruction in order to instruct those aspects of multi-crew co-operation (MCC) required by an applicant for a type rating on a first multi-pilot aeroplane.

5.~~2~~ Confirmation of competency of the applicant to be authorised as an MCCI(A) will be determined by the applicant conducting at least 3 hours MCC instruction to a satisfactory standard on the relevant FNPT or flight simulator under the supervision of a TRI(A), SFI(A) or MCCI(A) ~~notified by the Authority~~**nominated by the training organisation** for this purpose.

6. The course consists of ~~2~~ **3** parts

- Part 1, **Teaching and learning** that should follow the content of AMC FCL.920.
- Part 2, **Technical training**~~that should have the following content:~~**.**
- **Part 3, Practical instruction.**

PART 2

TECHNICAL TRAINING

7. The FSTD training consists of the application of core instructor competencies to MCC training in a commercial air transport environment, including principles of threat and error management and CRM.

The content of the training programme should cover MCC course exercises in sufficient depth to meet the standard required for issue of the MCCI (A) ~~authorization~~**certificate**.

7.1 The course should be related to the type of STD on which the applicant wishes to instruct. A training programme should give details of all theoretical knowledge instruction.

7.2 Identification and application of human factors (as set in the ATPL syllabus 040) related to multi-crew co-operation aspects of the training.

PART 3

PRACTICAL INSTRUCTION

8. The content of the instruction programme should cover training exercises as applicable to the MCC requirements of an applicant for a multi-pilot type rating.

8.1 Training Exercises

The exercises should be accomplished as far as possible in a simulated commercial air transport environment. The instruction should cover the following areas:

a. pre-flight preparation including documentation, and computation of take-off performance data;

b. pre-flight checks including radio and navigation equipment checks and setting;

c. before take-off checks including powerplant checks, and take-off briefing by PF;

d. normal take-offs with different flap settings, tasks of PF and PNF, call-outs;

e. rejected take-offs; crosswind take-offs; take-offs at maximum take-off mass; engine failure after V_1;

f. normal and abnormal operation of aircraft systems, use of checklists;

g. selected emergency procedures to include engine failure and fire, smoke control and removal, windshear during take-off and landing, emergency descent, incapacitation of a flight crew member;

h. early recognition of and reaction on approaching stall in differing aircraft configurations;

i. instrument flight procedures including holding procedures; precision approaches using raw navigation data, flight director and automatic pilot, one engine simulated inoperative approaches, non-precision and circling approaches, approach briefing by PF, setting of navigation equipment, call-out procedures during approaches; computation of approach and landing data;

j. go-arounds; normal and with one engine simulated inoperative, transition from instrument to visual flight on reaching decision height or minimum descent height/altitude.

k. landings, normal, crosswind and with one engine simulated inoperative, transition from instrument to visual flight on reaching decision height or minimum descent height/altitude.

SUBPART K

EXAMINER CERTIFICATES

GM No 1 to FCL.1000

Examiner certificates – special conditions

When new aircraft are introduced, requirements such as to hold a licence and rating equivalent to the one for which the skill test is being conducted, or to have adequate flight experience, may not be possible to comply with. In this case, to allow for the first ratings for these aircraft to be issued to applicants, competent authorities need the possibility to issue a specific certificate that does not have to comply with the requirements established in this Subpart.

The competent authority should only give these certificates to holders of other examiner certificates. As far as possible, preference should be given to persons with experience in similar types or classes of aircraft, for example, in aircraft having the same kind and number of engines or rotors and of the same order of mass or technology.

The certificate should ideally be limited in validity to the time needed to qualify the first examiners for the new aircraft in accordance with this Subpart, but in any case it should not exceed the 3 years established in the rule.

GM No 1 to FCL.1005 (b)

Limitation of privileges in case of vested interests
Examples of situation where the examiner should consider if his/her objectivity is affected are when the applicant is a relative or a friend of the examiner, or when they are linked by economical interests/political affiliations, etc.

AMC No 1 to FCL.1010

Pre-requisites for examiners

When evaluating the applicant's background, the competent authority should evaluate the personality and character of the applicant, and his/her cooperation with the authority.
The competent authority may also take into account whether the applicant has been convicted of any relevant criminal or other offenses, taking into account national law and principles of non-discrimination.

AMC No 1 to FCL.1015

Examiner standardisation course

GENERAL

1. The competent authority may provide the course itself or through an arrangement with a training organisation. This arrangement should clearly state that the training organisation is acting under the management system of the competent authority.

1.1 The course should last:

1.1.1 For the LAFE, FE and FIE, at least one day, divided into theoretical and practical training;

1.1.2 for other examiners, at least ~~5~~ **3** days, divided into ~~ground~~ **theoretical** training **(1 day)** and practical training in a simulator conducting role played proficiency checks and skill tests (at least ~~3~~ **2** days).

~~2.2.1~~1.2 The competent authority or the approved training organisation should determine any further training required before presenting the candidate for the examiner assessment of competence.

CONTENT

2. The training should comprise:

2.1 Theoretical training covering at least:

a. The contents of AMC No 2 to FCL.1015 and the Flight Examiners Manual (FEM).

b. Part-FCL and related AMCs and GM relevant to their duties;

c. Part-OPS and related AMC and GM relevant to their duties;

d. National requirements relevant to their examination duties.

e. Fundamentals of human performance and limitations relevant to flight examination.

f. Fundamentals of evaluation relevant to applicant's performance.

g. ~~Quality~~ **Management** System of ~~the~~ Approved Training Organisation**s**;

h. Multi-Crew Co-operation (MCC), Human Performance and Limitations, if applicable.

2.1.1 Examiners should also be briefed on the protection requirements for personal data, liability, accident insurance and fees, as applicable in the Member State concerned.

2.1.2 All items above are core knowledge requirements for an examiner and are recommended as core course material. This core course may be studied before recommended examiner training is commenced. The core course may utilise any suitable training format.

2.2 Practical training consisting of at least:

a. Knowledge and management of the test for which the certificate is to be sought. These are described in the relevant Modules in the Flight Examiner Manual (FEM).

b. Knowledge of the administrative procedures pertaining to that test/check.

c. For an initial examiner certificate, practical training should include the examination of the test profile sought, consisting of the conduct of at least two test/check profiles in the role of examiner **(these two tests/checks profiles can be performed in the same simulator session)**, including briefing, conduct of the skill test/proficiency check, assessment of the applicant to whom the test/check is given, debriefing and recording/documentation under the supervision of an examiner of the appropriate category on the applicable type. This training is conducted in the aircraft if approval for testing/checking in the aircraft is required. If examiner privileges in FSTD's are required, practical instruction in the use of FSTD(s) for testing/checking should also be completed.

~~2.2.1 The approved training organisation should determine any further training required before the candidate is presented to the Authority for the examiner assessment of competence.~~

2.2.**1**~~2~~ ~~For helicopters, i~~**I**f examiner privileges are to include the conduct of proficiency checks for the revalidation or renewal of an instrument rating, practical instruction should include the conduct of at least four instrument check profiles in the role of examiner, including briefing, conduct of the skill test/proficiency check, assessment of the applicant to whom the test/check is given, debriefing and recording/documentation under the supervision of an examiner of the appropriate category on the applicable type. This training is conducted in the aircraft if approval for testing/checking in the aircraft is required. If examiner privileges in both FSTD and aircraft are required, at least one of the instrument check profiles should be conducted in an FSTD.

2.3 For extension of an examiner certificate to further types (as required for TRE), further practical training on the new type may be required, consisting of the conduct of at least one test/check profile in the role of examiner on the new type, including briefing, conduct of the skill test/proficiency check, assessment of the applicant to whom the test/check is given, debriefing and recording/documentation under the supervision of an examiner of the appropriate category on the applicable type. A further examiner check on the new type may be required, which may be supervised by an inspector of the Authority or a suitably authorised senior examiner.

AMC No 2 to FCL.1015

Standardisation arrangements for examiners

LIMITATIONS

~~1 An examiner should plan per working day not more than three test checks relating to PPL, CPL, IR, LAFI or class rating, not more than four tests / checks relating to LPL,SPL or GPL, or more than two tests/checks related to FI, CPL/IR and ATPL or more than four tests/checks relating to type rating.~~

~~2 An examiner should plan at least two hours for a LPL, SPL or BPL, three hours for a PPL, CPL, IR, LAFI or class rating test/checks, and at least four hours for FI, CPL/IR, MPL, ATPL or type rating tests/checks, including pre-flight briefing and preparation, conduct of the test/check, de-briefing and evaluation of the applicant and documentation.~~

~~3~~**1.** An examiner should allow an applicant adequate time to prepare for a test/check, normally not more than one hour.

~~4~~**2.** **An examiner should plan a test/check flight so that all required exercises can be performed while allowing sufficient time for each of the exercises and with due regard to the weather conditions, traffic situation, ATC requirements and local procedures.** ~~An examiner should plan a test/check flight so that the flight time in an~~

~~aircraft or ground time in an approved synthetic training device is not less than:~~

~~a. 45 minutes for a LPL(B) / BPL, Basic LPL(A) / (H)~~

~~b. 90 minutes for LPL(A) / (H),PPL and CPL, including navigation section;~~

~~c. 60 minutes for IR, LAFI, FI and single pilot type/class rating; and~~

~~d. 120 minutes for CPL/IR, MPL and ATPL.~~

~~For the LPL(S) and SPL test /check flight the flight time must be sufficient to allow that all the items in each test/check section can be fully completed. If not all the items can be completed in one flight, additional flights have to be done.~~

PURPOSE OF A TEST/CHECK

~~5~~**3.** Determine through practical demonstration during a test/check that an applicant has acquired or maintained the required level of knowledge and skill/proficiency;

~~6~~**4.** Improve training and flight instruction in ~~registered facilities,~~ Approved Training Organisations by feedback of information from examiners concerning items/sections of tests/checks that are most frequently failed;

~~7~~**5.** Assist in maintaining and, where possible, improving air safety standards by having examiners display good airmanship and flight discipline during tests/checks.

CONDUCT OF TEST/CHECK

~~8~~**6.** An examiner will ensure that an applicant completes a test/check in accordance with Part-FCL requirements and is assessed against the required test/check standards.

~~9~~**7.** Each item within a test/check section should be completed and assessed separately. ~~A failed item is a failed section.~~ The test/check schedule, as briefed, should not normally be altered by an examiner. A failed item is not always a failed section, e.g. type rating skill test where a failure of an item in a section does not fail the entire section, only the failed item is taken again.

~~10~~**8.** Marginal or questionable performance of a test/check item should not influence an examiner's assessment of any subsequent items.

~~11~~**9.** An examiner should verify the requirements and limitations of a test/check with an applicant during the pre-flight briefing.

1**0**~~2~~. When a test/check is completed or discontinued, an examiner should debrief the applicant and give reasons for items/sections failed. In the event of a failed or discontinued skill test or proficiency check, the examiner should provide appropriate advice to assist the applicant in re-tests/re-checks.

1**1**~~3~~. Any comment on, or disagreement with, an examiner's test/check evaluation/assessment made during a debriefing will be recorded by the examiner on the test/check report, and will be signed by the examiner and countersigned by the applicant.

EXAMINER PREPARATION

1**2**~~4~~. An examiner should supervise all aspects of the test/check flight preparation, including, where necessary, obtaining or assuring an ATC 'slot' time.

1**3**~~5~~. An examiner will plan a test/check in accordance with Part-FCL requirements. Only the manoeuvres and procedures set out in the appropriate test/check form will be undertaken. The same examiner should not re-examine a failed applicant without the agreement of the applicant.

EXAMINER APPROACH

1**4**~~6~~. An examiner should encourage a friendly and relaxed atmosphere to develop both before and during a test/check flight. A negative or hostile approach should not be used. During the test/check flight, the examiner should avoid negative comments or criticisms and all assessments should be reserved for the debriefing.

ASSESSMENT SYSTEM

1**5**~~7~~. Although test/checks may specify flight test tolerances, an applicant should not be expected to achieve these at the expense of smoothness or stable flight. An examiner should make due allowance for unavoidable deviations due to turbulence, ATC instructions, etc. An examiner should terminate a test/check only for the purpose of assessing the applicant, or for safety reasons. An examiner will use one of the following terms for assessment:

a. A 'pass', provided the applicant demonstrates the required level of knowledge, skill/proficiency and, where applicable, remains within the flight test tolerances for the licence or rating; or

b. A 'fail' provided that any of the following apply:

   i. the flight test tolerances have been exceeded after the examiner has made due allowance for turbulence or ATC instructions;

   ii. the aim of the test/check is not completed;

   iii. the aim of exercise is completed but at the expense of safe flight, violation of a rule or regulation, poor airmanship or rough handling;

   iv. an acceptable level of knowledge is not demonstrated;

   v. an acceptable level of flight management is not demonstrated; or

   vi. the intervention of the examiner or safety pilot is required in the interest of safety.

c. A 'partial pass' in accordance with the criteria shown in the relevant skill test appendix of Part-FCL.

METHOD AND CONTENTS OF THE TEST/CHECK

1**6**~~8~~. Before undertaking a test/check, an examiner will verify that the aircraft or flight simulation synthetic training device intended to be used, is suitable and appropriately equipped for the test/check.

~~Only aircraft or synthetic flight simulation training devices approved by the Authority for skill testing/proficiency checking may be used.~~

1**7**~~9~~ A test/check flight will be conducted in accordance with the aircraft flight manual (AFM) and, if applicable, the aircraft operators manual (AOM).

~~20~~**18.** A test/check flight will be conducted within the limitations contained in the operations manual of a Approved Training Organisation~~ and, where applicable, the operations manual of a registered facility~~.

~~21~~**19.** Contents

a. A test/check is comprised of:

- oral examination on the ground (where applicable);
- pre-flight briefing;
- in-flight exercises; and
- post-flight debriefing

b. Oral examination on the ground should include:

- aircraft general knowledge and performance;
- planning and operational procedures; and
- other relevant items/sections of the test/check

c. Pre-flight briefing should include:

- test/check sequence;
- power setting and speeds, if applicable; and
- safety considerations

d. In-flight exercises will include:

- each relevant item/section of the test/check

e. Post-flight debriefing should include:

- assessment/evaluation of the applicant
- documentation of the test/check with the applicant’s FI present, if possible.

2**0**~~2~~. A test/check is intended to simulate a practical flight. Accordingly, an examiner may set practical scenarios for an applicant while ensuring that the applicant is not confused and air safety is not compromised.

2**1**~~3~~. **When manoeuvres are to be flown by sole reference to instruments, the examiner should ensure that a suitable method of screening is used to simulate IMC.**

22. An examiner should maintain a flight log and assessment record during the test/check for reference during the post/flight debriefing.

2**3.** An examiner should be flexible to the possibility of changes arising to pre-flight briefs due to ATC instructions, or other circumstances affecting the test/check.

2**4.** Where changes arise to a planned test/check an examiner should be satisfied that the applicant understands and accepts the changes. Otherwise, the test/check flight should be terminated.

2**5.** Should an applicant choose not to continue a test/check for reasons considered inadequate by an examiner, the applicant will be assessed as having failed those items/sections not attempted. If the test/check is terminated for reasons considered adequate by the examiner, only these items/sections not completed will be tested during a subsequent test/check.

2**6.** ~~At the discretion of the examiner, any manoeuvre or procedure of the test/check may be repeated once by the applicant.~~ An examiner may terminate a test/check at any stage, if it is considered that the applicant's competency requires a complete re-test/re-check.

GM No 1 to FCL.1015

Standardisation of examiners

1. An examiner should plan per working day not more than three test checks relating to PPL, CPL, IR, LAFI or class ratings, not more than four tests/checks relating to LAPL, SPL or BPL, or more than two tests/checks related to FI, CPL/IR and ATPL or more than four tests/checks relating to single-pilot type rating.

2 An examiner should plan at least two hours for a LAPL, SPL or BPL, three hours for a PPL, CPL, IR, LAFI or class rating test/checks, and at least four hours for FI, CPL/IR, MPL, ATPL or multi-pilot type rating tests/checks, including pre-flight briefing and preparation, conduct of the test/check, de-briefing and evaluation of the applicant and documentation.

3. When planning the duration of a test of check, the following values may be used as guidance:

a. 45 minutes for a LAPL(B)/BPL, Basic LAPL(A)~~ / (H)~~, and single-pilot class ratings VFR only.

b. 90 minutes for LAPL(A)/(H), PPL and CPL, including navigation section;

c. 60 minutes for IR, LAFI, FI and single pilot type/class rating; and

d. 120 minutes for CPL, MPL, ATPL and multi-pilot type ratings.

For the LAPL(S) and SPL test/check flight the flight time must be sufficient to allow that all the items in each test/check section can be fully completed. If not all the items can be completed in one flight, additional flights have to be done.

AMC No 1 to FCL.1020

Assessment of competence

GENERAL

1. The competent authority may nominate either one of its inspectors or a senior examiner to assess the competence of applicants for an examiner certificate.

DEFINITIONS

2. **Definitions:**

‘Inspector’ – The inspector of the Authority conducting the examiner competence assessment.

‘Examiner Applicant’ – The person seeking certification as an Examiner

‘Candidate’ – The person being tested/checked by the Examiner Applicant. This person may be a pilot for whom the test/check would be required, or the Inspector of the Authority who is conducting the Examiner Certification Acceptance Test.

CONDUCT OF THE ASSESSMENT

3. An inspector of the Authority~~,~~ or a senior examiner, will observe all examiner applicants conducting a test on a ‘candidate’ in an aircraft for which examiner certificate is sought. Items from the related ~~‘Syllabi for training course and skill tests/proficiency checks content for class/type rating’~~**training course and test/check schedule** will be selected by the inspector for examination of the ‘candidate’ by the examiner applicant. Having agreed with the inspector the content of the test, the examiner applicant will be expected to manage the entire test. This will include briefing, the conduct of the flight, assessment and debriefing of the ‘candidate’. The inspector will discuss the assessment with the examiner applicant before the ‘candidate’ is debriefed and informed of the result.

BRIEFING THE ‘CANDIDATE’

4**.** The ‘candidate’ should be given time and facilities to prepare for the test flight. The briefing should cover the following:

a. the objective of the flight

b. licensing checks, as necessary

c. freedom for the ‘candidate’ to ask questions

d. operating procedures to be followed (e.g. operators manual)

e. weather assessment

f. operating capacity of ‘candidate’ and examiner

g. aims to be identified by ‘candidate’

h. simulated weather assumptions (e.g. icing, cloud base)

i. use of screens (if applicable)

~~i~~**j**. contents of exercise to be performed

k~~j.~~ agreed speed and handling parameters (e.g. V-speeds, bank angle)

l~~k~~. use of R/T

m~~l~~. respective roles of ‘candidate’ and examiner (e.g. during emergency)

n~~m~~. administrative procedures (e.g. submission of flight plan)

5**.** The examiner ~~TRE~~ applicant should maintain the necessary level of communication with the ‘candidate’. The following check details should be followed by the examiner ~~TRE~~ applicant:

a. involvement of examiner in a multi-pilot operating environment

b. the need to give the ‘candidate’ precise instructions

c. responsibility for safe conduct of the flight

d. intervention by examiner, when necessary

e. use of screens

f. liaison with ATC and the need for concise, easily understood intentions

g. prompting the 'candidate' regarding required sequence of events (e.g. following a go-around)

h. keeping brief, factual and unobtrusive notes

ASSESSMENT

6**.** The examiner applicant should refer to the flight test tolerances given in the relevant skill test.~~Appendix..~~ Attention should be paid to the following points:

a. questions from the 'candidate'

b. give results of the test and any sections failed

c. give reasons for failure

DEBRIEFING

7**.** The examiner applicant should demonstrate to the inspector the ability to conduct a fair, unbiased, debriefing of the 'candidate' based on identifiable factual items. A balance between friendliness and firmness should be evident. The following points should be discussed with the 'candidate', at the applicant's discretion:

a. advise the candidate on how to avoid or correct mistakes

b. mention any other points of criticism noted

c. give any advice considered helpful

RECORDING/DOCUMENTATION

8. The examiner applicant should demonstrate to the inspector the ability to complete the relevant records correctly. These records may be:

a. the relevant ~~skill~~ test **/ check** form

b. licence entry

c. notification of failure form

d. relevant company forms where the examiner has privileges of conducting operator proficiency checks

DEMONSTRATION OF THEORETICAL KNOWLEDGE

9. The examiner applicant should demonstrate to the inspector a satisfactory knowledge of the regulatory requirements associated with the function of an examiner.

AMC No 1 to FCL.1020 and FCL.1025

Qualification of senior examiners

1. A senior examiner specifically tasked by the competent authority to observe skill tests or proficiency checks for the purpose of the revalidation of examiner certificates should:

a. Hold a valid/current Flight Examiner certificate;

b. Have Examiner experience level acceptable to the competent authority;

c. Have conducted a number of skill tests/proficiency checks conducted as a Part-FCL Examiner

2. The Authority may conduct a pre-assessment of the applicant/candidate carrying out a Skill Test/Proficiency Check under supervision of an Inspector of the Authority

3. Applicants should be required to attend a Senior Examiner Briefing / Course / Seminar arranged by competent authority. Content and duration will be determined by the competent authority and should include:

a. Pre course self-study;

b. Legislation;

c. The role of the Senior Examiner;

d. an examiner assessment;

e. national Administrative requirements

4. The validity of the authorisation should not exceed the validity of the examiners certificate, and in any case not exceed 3 years. The authorisation may be revalidated in accordance with procedures established by the competent authority.

AMC No 1 to FCL.1025

Examiner Refresher seminar

The Examiner refresher seminar should follow the content of the examiner standardisation course, included in AMC to FCL.1015, and take into account specific contents adequate to the category of examiner affected.

~~**AMC to FCL.1025**~~

~~**Validity, revalidation and renewal**~~

~~The period of 3 years should be counted in addition to the remainder of the month of issue. If issued within the final 12 calendar months of validity of a previous examiner check, the period of validity should be extended from the date of issue until 3 years from the expiry date of that previous examiner check. When the examiner authorization is revalidated at the same time as his instructor certificate, the validity period of the instructor certificate may be aligned with the examiner certificate.~~

AMC No 1 to FCL.1030 (b)(3)

Obligations for examiners —application and report forms

1. Common application and report forms can be found:

1.1 For skill tests / proficiency checks for issue / revalidation / renewal of LAPL / PPL / BPL / SPL / IR, in AMC No 1 to Appendix 7.

1.2 For skill tests / proficiency checks for ATPL / MPL / type ratings, in AMC No 1 to Appendix 9.

1.3 For assessments of competence for instructors, in AMC No 5 to FCL.935.

AMC No 1 to Appendix 3

GENERAL

1. **When ensuring that the applicant complies with the prerequisites for the course, in accordance with OR.ATO.145, the approved training organisation should check that the applicant has enough knowledge of mathematics, physics and English to facilitate the understanding of the theoretical knowledge instruction content of the course.**

2. **Whenever reference is made to a certain amount of hours of training, this means a full hour. Time not directly assigned to training (such as breaks, etc.) is not to be counted towards the total amount of time that is required.**

A. ATP integrated course — Aeroplanes

1. **The ATP integrated course should last between 12 and 36 months. This period may be extended where additional flying training or ground instruction is provided by the approved training organisation.**

CREDITING

~~**31.** In the case of a PPL(A) or PPL(H) entrant, 50% of the aircraft hours flown by the entrant prior to the course may be credited towards the required flight instruction up to a maximum of 40 hours flying experience, or 45 hours if an aeroplane night rating has been obtained, of which up to 20 hours may be dual instruction. This~~

2. **C**redit for **previous experience given to an applicant who already holds a PPL**~~ the hours flown~~ should be entered into the applicant's training record. In the case of a student pilot who does not hold a pilot licence and with the approval of the authority**,** a**n** ATO may designate certain dual exercises to be flown in a helicopter or a TMG up to a maximum of 20 hours.

THEORETICAL KNOWLEDGE

3. The 750 hours of instruction can include classroom work, interactive video, slide/tape presentation, learning carrels, computer**-**based training, and other media as approved by the authority, in suitable proportions.
The 750 hours of instruction should be divided in such a way that in each subject the minimum hours are:

Subject	*hours*
Air Law	40
Aircraft General Knowledge	80
Flight Performance & Planning	90
Human Performance & Limitations	50
Meteorology	60
Navigation	150
Operational Procedures	20

Principles of Flight	30
Communications	30

Other subdivision of hours may be agreed upon between the authority and the ATO.

4. The flying instrcution is divided into 4 phases:

4.1 Phase 1

Exercises up to the first solo flight comprise a total of at least 10 hours dual flight instruction on a single-engine aeroplane including:

(a) pre-flight operations, mass and balance determination, aeroplane inspection and servicing;

(b) aerodrome and traffic pattern operations, collision avoidance and precautions;

(c) control of the aeroplane by external visual references;

(d) normal take-offs and landings;

(e) flight at critically low airspeeds, recognition of and recovery from incipient and full stalls, spin avoidance; and

(f) unusual attitudes and simulated engine failure.

4.2 Phase 2

Exercises up to the first solo cross-country flight comprise a total of at least 10 hours of dual flight instruction and at least 10 hours solo flight including:

(a) maximum performance (short field and obstacle clearance) take-offs, short-field landings;

(b) flight by reference solely to instruments, including the completion of a 180°º turn;

(c) dual cross-country flying using external visual references, dead reckoning and radio navigation aids, diversion procedures;

(d) aerodrome and traffic pattern operations at different aerodromes;

(e) crosswind take-offs and landings;

(f) abnormal and emergency procedures and manoeuvres, including simulated aeroplane equipment malfunctions;

(g) operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures, radio telephony procedures and phraseology; and

(h) knowledge of meteorological briefing arrangements, evaluation of weather conditions for flight and use of Aeronautical Information Services (AIS).

4.3 Phase 3

Exercises up to the VFR navigation progress test comprise a total of at least 5 hours of dual instruction and at least ~~25~~ **40** hours as pilot-in-command.

The dual instruction and testing up to the VFR navigation progress test should comprise:

(a) repetition of exercises of Phases 1 and 2;

(b) VFR flight at relatively critical high airspeeds, recognition of and recovery from spiral dives;

(c) VFR navigation progress test conducted by a flight instructor not connected with the applicant's training**;**~~.~~

(d) **night fight including take-offs and landings as pilot-in-command.**

4.4 Phase 4

Exercises up to the instrument rating skill test comprise:

(a) at least 55 hours instrument flight, which may contain up to 25 hours of instrument ground time in a**n** FNPT I or up to 40 hours in an FNPT II or flight simulator which should be conducted by a flight instructor and/or an authorised synthetic flight instructor;~~ and~~

(b**)** ~~35~~ **20** hours instrument time flown as SPIC;

~~(c.) night flight including take-offs and landings as pilot-in-command;~~

(c~~d~~**)** pre-flight procedures for IFR flights, including the use of the flight manual and appropriate air traffic services documents in the preparation of an IFR flight plan;

(d~~e~~**)** procedures and manoeuvres for IFR operation under normal, abnormal and emergency conditions covering at least**:**~~;~~

— transition from visual to instrument flight on take-off**,**

— standard instrument departures and arrivals**,**

— en**-**route IFR procedures**,**

— holding procedures**,**

— instrument approaches to specified minima**,**

— missed approach procedures**,**

— landings from instrument approaches, including circling;

(e~~f~~**)** in-flight manoeuvres and specific flight characteristics; and

(f~~g~~**)** operation of a multi-engine aeroplane in the exercises of ~~5~~**4**(e), including operation of the aeroplane solely by reference to instruments with one engine simulated inoperative, and engine shut-down and restart (the latter training should be at a safe altitude unless carried out in a synthetic training device).

Phase 5

5**.** Instruction and testing in multi-crew co-operation (MCC) comprise the relevant training requirements.

6. If a type rating for multi-pilot aeroplanes is not required on completion of this part, the applicant will be provided with a certificate of course completion for MCC training.

B. ATPL(A) — Modular theoretical knowledge course

1. The aim of this course is to train pilots who have not received the theoretical knowledge instruction during an integrated course to the level of theoretical knowledge required for the ATPL.

2. An approved course should include formal classroom work and may include the use of such facilities as interactive video, slide/tape presentation, learning carrels and computer-~~-~~based training and other media distance learning (correspondence) courses as approved by the authority. Approved distance learning (correspondence) courses may also be offered as part of the course.

3. The ATP modular course should last 18 months. This period may be extended where additional training is provided by the approved training organisation. The flight instruction and skill test need to be completed within the period of validity of the pass in the theoretical examinations.

C~~B~~. CPL/IR integrated course — Aeroplanes

1. The CPL/IR integrated course should last between 9 and 30 months. This period may be extended where additional flying training or ground instruction is provided by the approved training organisation.

CREDITING

~~In the case of a PPL(A) or PPL(H) entrant, 50% of the aircraft hours flown by the entrant prior to the course may be credited towards the required flight instruction up to a maximum of 40 hours flying experience, or 45 hours if an aeroplane night rating has been obtained, of which up to 20 hours may be dual instruction. This c~~

2. Credit for **previous experience given to an applicant who already holds a PPL** ~~the hours flown~~ should be entered into the applicant's training record. In the case of a student pilot who does not hold a pilot licence and with the approval of the **a**~~A~~uthority**,** a**n** ATO may designate certain dual exercises to be flown in a helicopter or a TMG up to a maximum of 20 hours.

THEORETICAL KNOWLEDGE

3. The 500 hours of instruction can include classroom work, interactive video, slide/tape presentation, learning carrels, computer**-**~~-~~based training, and other media as approved by the authority, in suitable proportions.

The 500 hours of instruction should be divided in such a way that in each subject the minimum hours are:

Subject	*hours*
Air Law	30
Aircraft General Knowledge	50
Flight Performance & Planning	60

Human Performance & Limitations	15
Meteorology	40
Navigation	100
Operational Procedures	10
Principles of Flight	25
Communications	30

Other subdivisions of hours may be agreed **upon** between the **a**~~A~~uthority and the ATO.

4. The flying instrcution is divided into 4 phases:

4.1 Phase 1

Exercises up to the first solo flight comprise a total of at least 10 hours dual flight instruction on a single-engine aeroplane including:

(a) pre-flight operations, mass and balance determination, aeroplane inspection and servicing;

(b) aerodrome and traffic pattern operations, collision avoidance and precautions;

(c) control of the aeroplane by external visual references;

(d) normal take-offs and landings;

(e) flight at critically low airspeeds, recognition of and recovery from incipient and full stalls, spin avoidance; and

(f) unusual attitudes and simulated engine failure.

4.2 Phase 2

Exercises up to the first solo cross-country flight comprise a total of at least 10 hours of dual flight instruction and at least 10 hours solo flight including:

(a) maximum performance (short field and obstacle clearance) take-offs, short-field landings;

(b) flight by reference solely to instruments, including the completion of a 180°º turn;

(c) dual cross-country flying using external visual references, dead reckoning and radio navigation aids, diversion procedures;

(d) aerodrome and traffic pattern operations at different aerodromes;

(e) crosswind take-offs and landings;

(f) abnormal and emergency operations and manoeuvres, including simulated aeroplane equipment malfunctions;

(g) operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures, radio telephony procedures and phraseology; and

(h) knowledge of meteorological briefing arrangements, evaluation of weather conditions for flight and use of Aeronautical Information Services (AIS).

4.3 Phase 3

Exercises up to the VFR navigation progress test comprise a total of at least 5 hours of instruction and at least 40 hours as pilot-in-command.

The dual instruction and testing up to the VFR navigation progress test and the skill test should contain the following:

(a) repetition of exercises of Phases 1 and 2;

(b) VFR flight at relatively critical high airspeeds, recognition of and recovery from spiral dives;

(c) VFR navigation progress test conducted by a flight instructor not connected with the applicant's training**;**

(d) **night flight including take-offs and landings as pilot-in-command.**

4.4 Phase 4

Exercises up to the instrument rating skill test comprise:

(a**)** at least 55 hours instrument time, which may contain up to 25 hours of instrument ground time in an FNPT I or up to 40 hours in an FNPT II or flight simulator which should be conducted by a flight instructor and/or an authorised synthetic flight instructor, and;

(b**)** ~~50~~ **20** hours instrument time flown as SPIC;

~~(c.) night flight including take-offs and landings as pilot-in-command;~~

(c~~d~~**)** pre-flight procedures for IFR flights, including the use of the flight manual and appropriate air traffic services documents in the preparation of an IFR flight plan;

(de**)** procedures and manoeuvres for IFR operation under normal, abnormal and emergency conditions covering at least:

— transition from visual to instrument flight on take-off**,**

— standard instrument departures and arrivals**,**

— en**-**route IFR procedures**,**

— holding procedures**,**

— instrument approaches to specified minima**,**

— missed approach procedures**,**

— landings from instrument approaches, including circling;

(e~~f~~**)** in flight manoeuvres and particular flight characteristics; and

(f~~g~~**)** operation of either a single-engine or a multi-engine aeroplane in the exercises of 5(e), including in the case of a multi-engine aeroplane~~,~~ operation of the aeroplane solely by reference to instruments with one engine simulated inoperative and engine shut**-**~~—~~down and restart. The latter exercise is to be conducted at a safe altitude unless carried out in a synthetic training device.

~~C~~D. CPL integrated course — Aeroplanes

1. **The CPL integrated course should last between 9 and 24 months. This period may be extended where additional flying training or ground instruction is provided by the approved training organisation.**

CREDITING

2. ~~In the case of a PPL(A) or PPL(H) entrant, 50% of the aircraft hours flown by the entrant prior to the course may be credited towards the required flight instruction up to a maximum of 40 hours flying experience, or 45 hours if an aeroplane night rating has been obtained, of which up to 20 hours may be dual instruction. This~~ **C**redit for the hours flown should be entered into the applicant's training record. In the case of a student pilot who does not hold a pilot licence and with the approval of the **a**uthority**,** a**n** ATO may designate certain dual exercises to be flown in a helicopter or a TMG up to a maximum of 20 hours.

THEORETICAL KNOWLEDGE

3. The 350 hours of instruction can include classroom work, interactive video, slide/tape presentation, learning carrels, computer-–based training, and other media as approved by the authority, in suitable proportions.

4. The flying instrcution is divided into 4 phases:

4.1 Phase 1

Exercises up to the first solo flight comprise a total of at least 10 hours dual flight instruction on a single-engine aeroplane including:

(a) pre-flight operations, mass and balance determination, aeroplane inspection and servicing;

(b) aerodrome and traffic pattern operations, collision avoidance and precautions;

(c) control of the aeroplane by external visual references;

(d) normal take-offs and landings;

(e) flight at relatively slow airspeeds, recognition of and recovery from incipient and full stalls, spin avoidance; and

(f) unusual attitudes and simulated engine failure.

4.2 Phase 2

Exercises up to the first solo cross-country flight comprise a total of at least 10 hours of dual flight instruction and at least 10 hours solo flight including:

(a) maximum performance (short field and obstacle clearance) take-offs, short-field landings;

(b) flight by reference solely to instruments, including the completion of a 180° turn;

(c) dual cross-country flying using external visual references, dead reckoning and radio navigation aids, diversion procedures;

(d) aerodrome and traffic pattern operations at different aerodromes;

(e) crosswind take-offs and landings;

(f) abnormal and emergency procedures and manoeuvres, including simulated aeroplane equipment malfunctions;

(g) operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures, radio telephony procedures and phraseology; and

(h) knowledge of meteorological briefing arrangements, evaluation of weather conditions for flight and use of Aeronautical Information Services (AIS).

4.3 Phase 3

Exercises up to the VFR navigation progress test comprise a total of at least 30 hours instruction and at least 58 hours as pilot-in-command, including:

(a) at least 10 hours instrument time, which may contain 5 hours of instrument ground time in a**n** FNPT or a flight simulator and should be conducted by a flight instructor and/or an authorised synthetic flight instructor**;**

(b) repetition of exercises of Phases 1 and 2, which should include at least five hours in an aeroplane certificated for the carriage of at least four persons and have a variable pitch propeller and retractable landing gear;

(c) VFR flight at relatively critical high airspeeds, recognition of and recovery from spiral dives; and

(d) night flight time including take-offs and landings as pilot-in-command.

4.4 Phase 4

The dual instruction and testing up to the CPL(A) skill test contain the following:

(a) up to 30 hours instruction which may be allocated to specialised aerial work training;

(b) repetition of exercises in Phase 3, as required;

(c) in-flight manoeuvres and particular flight characteristics; and

(d) multi-engine training.

If required, operation of a multi-engine aeroplane including operation of the aeroplane with one engine simulated inoperative, and engine shutdown and restart (the latter exercise at a safe altitude unless carried out in a synthetic training device).

E~~D~~. CPL modular course ~~—~~– Aeroplanes

1. **The CPL modular course should last 18 months. This period may be extended where additional training is provided by the approved training organisation. The flight instruction and skill test need to be completed within the period of validity of the pass in the theoretical examinations.**

2. An approved course should include formal classroom work and may include the use of such facilities as interactive video, slide/tape presentation, learning carrels and computer-based training and other media distance learning (correspondence) courses as approved by the authority. Approved distance learning (correspondence) courses may also be offered as part of the course.

THEORETICAL KNOWLEDGE

3. The 250 hours of instruction can include classroom work, interactive video, slide/tape presentation, learning carrels, computer-based training, and other media as approved by the authority, in suitable proportions.

FLYING TRAINING

4. The following flight time is suggested for the flying training:

4.1	Visual flight training	Suggested flight time
1**.**	Pre-flight operations; mass and balance determination, aeroplane inspection and servicing.	
2**.**	Take-off, traffic pattern, approach and landing. Use of checklist; collision avoidance; checking procedures.	0:45
3**.**	Traffic patterns: simulated engine failure during and after take-off.	0:45
4**.**	Maximum performance (short field and obstacle clearance) take-offs; short-field landings.	1:00
5**.**	Crosswind take-offs and landings; go-arounds.	1:00
6**.**	Flight at relatively critical high airspeeds; recognition of and recovery from spiral dives.	0:45
7**.**	Flight at critically slow airspeeds, spin avoidance, recognition of and recovery from~~,~~ incipient and full stalls.	0:45
8**.**	Cross-country flying using dead reckoning and radio navigation aids. Flight planning by the applicant; filing of ATC flight plan; evaluation of weather briefing documentation, NOTAM**,** etc**.**; radio telephony	10:00

procedures and phraseology; positioning by radio navigation aids; operation to, from and transiting controlled aerodromes, compliance with air traffic services procedures for VFR flights, simulated radio communication failure, weather deterioration, diversion procedures; simulated engine failure during cruise flight; selection of an emergency landing strip.

4.2 Instrument flight training

This module is identical to the 10 hour Basic Instrument Flight Module as set out in AMC 2 to Appendix 6. This module is focused on the basics of flying by sole reference to instruments, including limited panel and unusual attitudes.

All exercises may be performed in a**n** FNPT I or II or a flight simulator. If instrument flight training is in VMC, a suitable means of simulating IMC for the student should be used.

A BITD may be used for the following exercises**:** 9, 10, 11, 12, 14 and 16.

The use of the BITD is subject to the following:

— the training is complemented by exercises on an aeroplane**,**~~;~~

— the record of the parameters of the flight is available~~;~~**,** and

— **an** FI(A) or IRI(A) conducts the instruction.

9**.** Basic instrument flying without external visual cues. Horizontal flight; power changes for acceleration or deceleration, maintaining straight and level flight; turns in level flight with 15° and 25° bank, left and right; roll-out onto predetermined headings. — 0:30

10**.** Repetition of exercise 9.; additionally climbing and descending, maintaining heading and speed, transition to — 0:45

horizontal flight; climbing and descending turns.

11. Instrument pattern: 0:45

start exercise, decelerate
to approach speed, flaps into
approach configuration;

initiate standard turn
(left or right);

roll out on opposite heading,
maintain new heading for
1 minute;

standard turn, gear down,
descend 500 ft/min;

roll out on initial heading,
maintain descent (500 ft/min)
and new heading for 1 minute;

transition to horizontal
flight, 1.000 ft below
initial flight level;

initiate go-around; and

climb at best rate
of climb speed.

12. Repetition of exercise 9 and steep turns with 45° bank; recovery from unusual attitudes. 0:45

13. Repetition of exercise 12. 0:45

14. Radio navigation using VOR, NDB or, if available, VDF; interception of predetermined QDM, QDR. 0:45

15. Repetition of exercise 9 and recovery from unusual attitudes. 0:45

16. Repetition of exercise 9, turns and level change [and recovery from unusual attitudes] with simulated failure of the artificial horizon 0:45

and/or directional gyro.

17**.**	Recognition of, and recovery from, incipient and full stalls.	0:45
18**.**	Repetition of exercises 14, 16 and 17**.**	3:30

5. Multi-engine training

5.1. If required, operation of a multi-engine aeroplane in the exercises 1 through 18, including operation of the aeroplane with one engine simulated inoperative, and engine shutdown and restart. Before commencing training, the applicant should have complied with the type and class ratings requirements as appropriate to the aeroplane used for the test.

F~~E~~. ATP/IR integrated course — Helicopters

1. The ATP/IR integrated course should last between 12 and 36 months. This period may be extended where additional flying training or ground instruction is provided by the approved training organisation.

CREDITING

~~In the case of a PPL(H) entrant, 50% of the helicopter hours flown by the entrant prior to the course may be credited towards the required flight instruction to a maximum of :~~

~~(a) up to 40 hours, of which up to 20 hours may be dual instruction, or~~

~~(b) if a helicopter night rating has been obtained, up to 50 hours, of which up to 25 hours may be dual instruction.~~

2. ~~This c~~**C**redit for the hours flown should be entered into the applicant's training record. In case of a student pilot who does not hold a pilot licence and with the approval of the authority, a**n** ATO may designate certain dual exercises to be flown in an aeroplane or a TMG up to a maximum of 20 hours.

THEORETICAL KNOWLEDGE

3. The 750 hours of instruction can include classroom work, interactive video, slide/tape presentation, learning carrels, computer-based training, and other media as approved by the authority, in suitable proportions.

The 750 hours of instruction should be divided in such a way that in each subject the minimum hours are:

Subject	*hours*
Air Law	40
Aircraft General Knowledge	80
Flight Performance & Planning	90
Human Performance & Limitations	50
Meteorology	60
Navigation	150

Operational Procedures	20
Principles of Flight	30
Communications	30

Other sub–division of hours may be agreed **upon** between the authority and the ATO.

4.1 The flight instruction is divided into 4 phases:

4.1 Phase 1

Flight exercises up to the first solo flight comprise a total of not less than 12 hours dual flight instruction on a helicopter including:

(a) pre-flight operations, mass and balance determination**,** helicopter inspection and servicing;

(b) aerodrome and traffic pattern operations, collision avoidance and procedures;

(c) control of the helicopter by external visual reference;

(d) take-offs, landings, hovering, look–out turns and normal transitions from and to the hover;

(e) emergency procedures, basic auto-rotations, simulated engine failure, ground resonance recovery if relevant to type.

4.2 Phase 2

Flight exercises until general handling and day VFR navigation progress check, and basic instrument flying progress check. This phase comprises a total flight time of not less than 128 hours including 73 hours of dual flight instruction flight time and including at least 5 hours VFR conversion training on a multi-engine helicopter, 15 hours of solo flight and 40 hours flown as student pilot-in-command. The instruction and testing contain the following:

(a) sideways and backwards flight, turns on the spot;

(b) incipient vortex ring recovery;

(c) advanced/touchdown auto-rotations, simulated engine-off landings, practice forced landings. Simulated equipment malfunctions and emergency procedures relating to malfunctions of engines, controls, electrical and hydraulic circuits;

(d) steep turns;

(e) transitions, quick stops, out of wind manoeuvres, sloping ground landings and take-offs;

(f) limited power and confined area operations including low level operations to and from unprepared sites;

(g) flight by sole reference to basic flight instruments including completion of a 180° turn and recovery from unusual attitudes to simulate inadvertent entry into cloud;

(h) cross-country flying by external visual reference, dead reckoning and radio navigation aids, diversion procedures;

(i) aerodrome and traffic pattern operations at different aerodromes;

(j) operations to, from and transiting controlled aerodromes; compliance with air traffic services procedures, radio telephony procedures and phraseology;

(k) application of meteorological briefing arrangements, evaluation of weather conditions for flight and use of Aeronautical Information Services (AIS);

(l) night flight including take-offs and landings as pilot-in-command;

(m) general handling, day VFR navigation and basic instrument flying progress checks in accordance with Appendix 4 to Part-FCL, conducted by a flight instructor not connected with the applicant’s training.

4.3 Phase 3

Flight exercises up to Instrument Rating skill test. This part comprises a total of 40 hours dual instrument flight time including 10 hours of a multi engine IFR certificated helicopter.
The instruction and testing should contain the following:

(a) pre-flight procedures for IFR flights including the use of the flight manual and appropriate air traffic services documents in the preparation of an IFR flight plan**;**~~.~~

(b) procedures and manoeuvres for IFR operation under normal, abnormal and emergency conditions covering at least:

— transition from visual to instrument flight on take-off**,**

— standard instrument departures and arrivals**,**~~.~~

— en-route IFR procedures**,**

— holding procedures**,**

— instrument approaches to specified minima**,**

— missed approach procedure**,**

— landings from instrument approaches**,**

— in-flight manoeuvres and particular flight characteristics**,**

— instrument exercises with one engine simulated inoperative.

4.4 Phase 4

Instruction in multi-crew co~~-~~operation (MCC) should comprise the relevant training set out in AMC to FCL.**735.H**~~H.1.724~~.

If a type rating for multi-pilot helicopter is not required on completion of this part, the applicant should be provided with a certificate of course completion for MCC training.

GF. ATP integrated course —~~-~~ Helicopters

1. The ATP integrated course should last between 12 and 36 months. This period may be extended where additional flying training or ground instruction is provided by the approved training organisation.

CREDITING

~~In the case of a PPL(H) entrant, 50% of the helicopter hours flown by the entrant prior to the course may be credited towards the required flight instruction to a maximum of :~~

~~(a) up to 40 hours, of which up to 20 hours may be dual instruction, or~~

~~(b) if a helicopter night rating has been obtained, up to 50 hours, of which up to 25 hours may be dual instruction.~~

2. ~~This c~~**C**redit for the hours flown should be entered into the applicant's training record. In case of a student pilot who does not hold a pilot licence and with the approval of the authority, a**n** ATO may designate certain dual exercises to be flown in an aeroplane or a TMG up to a maximum of 20 hours.

THEORETICAL KNOWLEDGE

3. The 650 hours of instruction can include classroom work, interactive video, slide/tape presentation, learning carrels, computer-based training, and other media as approved by the authority, in suitable proportions.

The 650 hours of instruction should be divided in such a way that in each subject the minimum hours are:

Subject	*hours*
Air Law	30
Aircraft General Knowledge	70
Flight Performance & Planning	65
Human Performance & Limitations	40
Meteorology	40
Navigation	120
Operational Procedures	20
Principles of Flight	30
Communications	25

Other sub–division of hours may be agreed **upon** between the authority and the ATO.

4. The flight instruction is divided into 3 phases:

4.1 Phase 1

Flight exercises up to the first solo flight comprise a total of not less than 12 hours dual flight instruction on a helicopter including:

(a) pre-flight operations, mass and balance determination**,** helicopter inspection and servicing;

(b) aerodrome and traffic pattern operations, collision avoidance and procedures;

(c) control of the helicopter by external visual reference;

(d) take-offs, landings, hovering, look–out turns and normal transitions from and to the hover;

(e) emergency procedures, basic auto-rotations, simulated engine failure, ground resonance recovery if relevant to type.

4.2 Phase 2

Flight exercises until general handling and day VFR navigation progress and basic instrument flying progress check conducted by a flight instructor not connected with the applicant’s training. This phase comprises a total flight time of not less than 128 hours including 73 hours of dual instruction flight time and including at least 5 hours VFR conversion training on a multi-engine helicopter, 15 hours of solo flight and 40 hours flown as student pilot-in-command. The instruction and testing contain the following:

(a) sideways and backwards flight, turns on the spot;

(b) incipient vortex ring recovery;

(c) touchdown/advanced auto-rotations, simulated engine-off landings, practice forced landings. Simulated equipment malfunctions and emergency procedures relating to malfunctions of engines, controls, electrical and hydraulic circuits;

(d) steep turns;

(e) transitions, quick stops, out of wind manoeuvres, sloping ground landings and take-offs;

(f) limited power and confined area operations including low level operations to and from unprepared sites;

(g) 10 hours flight by sole reference to basic flight instruments, including completion of a 180° turn and recovery from unusual attitudes to simulate inadvertent entry into cloud;

(h) cross-country flying by external visual reference, dead reckoning and radio navigation aids, diversion procedures;

(i) aerodrome and traffic pattern operations at different aerodromes;

(j) operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures, radio telephony procedures and phraseology;

(k) application of meteorological briefing arrangements, evaluation of weather conditions for flight and use of Aeronautical Information Services (AIS);

(l) night flight including take-offs and landings as pilot-in-command;

(m) general handling, day VFR navigation and basic instrument flying progress checks in accordance **with** Appendix 4 to Part-FCL, conducted by a flight instructor not connected with the applicant’s training.

4.3 Phase 3

Instruction in multi-crew cooperation (MCC) comprise**s** the relevant training set out in AMC to FCL.**735.H** ~~H.2.724~~.
If a type rating for multi-pilot helicopter is not required on completion of this part, the applicant should be provided with a certificate of course completion for MCC training.

H. ATP(H) — Modular theoretical knowledge course

1. The aim of this course is to train pilots who have not received the theoretical knowledge instruction during an integrated course to the level of theoretical knowledge required for the ATPL.

2. An approved course should include formal classroom work and may include the use of such facilities as interactive video, slide/tape presentation, learning carrels and computer-–based training and other media distance learning (correspondence) courses as approved by the authority. Approved distance learning (correspondence) courses may also be offered as part of the course.

3. The ATP modular course should last 18 months. This period may be extended where additional training is provided by the approved training organisation. The flight instruction and skill test need to be completed within the period of validity of the pass in the theoretical examinations.

~~G~~I. CPL/IR integrated course — Helicopters

1. The CPL/IR integrated course should last between 9 and 30 months. This period may be extended where additional flying training or ground instruction is provided by the approved training organisation.

CREDITING

2. In the case of a PPL(H) entrant, 50% of the helicopter hours flown by the entrant prior to the course may be credited towards the required flight instruction to a maximum of:

(a) up to 40 hours, of which up to 20 hours may be dual instruction**;** or

(b) if a helicopter night rating has been obtained, up to 50 hours, of which up to 25 hours may be dual instruction.

This credit for the hours flown should be entered into the applicant's training record. In case of a student pilot who does not hold a pilot licence and with the approval of the authority, a**n** ATO may designate certain dual exercises to be flown in an aeroplane or a TMG up to a maximum of 20 hours.

THEORETICAL KNOWLEDGE

3. The 500 hours of instruction can include classroom work, interactive video, slide/tape presentation, learning carrels, computer-based training, and other media as approved by the authority, in suitable proportions.
The 500 hours of instruction should be divided in such a way that in each subject the minimum hours are:

Subject	*hours*
Air Law	30
Aircraft General Knowledge	50
Flight Performance & Planning	60
Human Performance & Limitations	15
Meteorology	40
Navigation	100
Operational Procedures	10

Principles of Flight	25
Communications	30

Other subdivision of hours may be agreed **upon** between the authority and the ATO.

4. The flight instruction is divided in 3 phases:

4.1 Phase 1

Flight exercises up to the first solo flight. This part comprises a total of at least 12 hours dual flight instruction on a helicopter including:

(a) pre-flight operations: mass and balance determination**,** helicopter inspection and servicing;

(b) aerodrome and traffic pattern operations, collision avoidance and procedures;

(c) control of the helicopter by external visual reference;

(d) take-offs, landings, hovering, look–out turns and normal transitions from and to the hover;

(e) emergency procedures, basic auto-rotation, simulated engine failure, ground resonance recovery if relevant to type.

4.2 Phase 2

Flight exercises until general handling and day VFR navigation progress check conducted by a flight instructor not connected with the applicant's training, and basic instrument progress check. This part comprises a total flight time of not less than 128 hours including 73 hours of dual instruction flight time and including at least 5 hours VFR conversion training on a multi-engine helicopter, 15 hours of solo flight and 40 hours flown as SPIC. The instruction and testing contain the following:

(a**)** sideways and backwards flight, turns on the spot;
(b**)** incipient vortex ring recovery;
(c**)** touchdown/advanced auto-rotation and simulated engine-off landings, practice forced landings. Simulated equipment malfunctions and emergency procedures relating to malfunctions of engines, controls, electrical and hydraulic circuits;
(d**)** steep turns;
(e**)** transitions, quick stops, out of wind manoeuvres, sloping ground landings and take-offs;
(f**)** limited power and confined area operations including selection of and low level -operations to and from unprepared sites;
(g**)** flight by sole reference to basic flight instruments, including completion of 180**°** ~~o~~ turn- and recovery from unusual attitudes to simulate inadvertent entry into cloud;
(h**)** cross-country flying by external visual reference, dead reckoning and radio navigation aids, diversion procedures;
(i**)** aerodrome and traffic pattern operations at different aerodromes;
(j**)** operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures, radio telephony procedures and phraseology;
(k**)** application of meteorological briefing arrangements, evaluation of weather conditions for flight and use of Aeronautical Information Services (AIS);

~~general handling progress test conducted by a delegated instructor not connected with the applicant's training;m~~

(l) night flight including take-offs and landings as pilot-in-command;

~~n. general handling, day VFR navigation and basic instrument flying progress checks, conducted by a flight instructor not connected with the applicants training.~~

(m) general handling, day VFR navigation and basic instrument flying progress checks in accordance with Appendix 4 to Part-FCL, conducted by a flight instructor not connected with the applicant's training.

4.3 Phase 3

Flight exercises up to Instrument Rating skill test. This part comprises a total of 40 hours dual instrument flight time including 10 hours of a multi**-**~~-~~engine IFR certificated helicopter.
The instruction and testing should contain the following:

(a) pre-flight procedures for IFR flights including the use of the flight manual and appropriate air traffic services documents in the preparation of an IFR flight plan**;**~~.~~

(b) procedures and manoeuvres for IFR operation under normal, abnormal and emergency conditions covering at least:

— transition from visual to instrument flight on take-off**,**

— standard instrument departures and arrivals**,**

— en-route IFR procedures**,**

— holding procedures**,**

— instrument approaches to specified minima**,**

— missed approach procedure**,**

— landings from instrument approaches**,**

— in-flight manoeuvres and particular flight characteristics**,**

— instrument exercises with one engine simulated inoperative.

J~~H~~. CPL integrated course —~~-~~ Helicopters

1. The CPL integrated course should last between 9 and 24 months. This period may be extended where additional flying training or ground instruction is provided by the approved training organisation.

CREDITING

~~In the case of a PPL(H) entrant, 50% of the helicopter hours flown by the entrant prior to the course may be credited towards the required flight instruction to a maximum of :~~

~~(a) up to 40 hours, of which up to 20 hours may be dual instruction~~**;**~~, or~~

~~(b) up to 50 hours if a helicopter night rating has been obtained, of which up to 25 hours may be dual instruction.~~

2. ~~This c~~**C**redit for the hours flown should be entered into the applicant's training record. In case of a student pilot who does not hold a pilot licence and with the approval of the authority, a**n** ATO may designate certain dual exercises to be flown in an aeroplane or a TMG up to a maximum of 20 hours.

THEORETICAL KNOWLEDGE

3. The 350 hours of instruction can include classroom work, interactive video, slide/tape presentation, learning carrels, computer-based training, and other media as approved by the authority, in suitable proportions.

The 350 hours of instruction should be divided in such a way that in each subject the minimum hours are:

Subject	*hours*
Air Law	25
Aircraft General Knowledge	30
Flight Performance & Planning	25
Human Performance & Limitations	10
Meteorology	30
Navigation	55
Operational Procedures	8
Principles of Flight	20
Communications	10

Other subdivision of hours may be agreed **upon** between the authority and the ATO.

4. The flight instruction is divided into 2 phases:

4.1 Phase 1

Flight exercises up to the first solo flight. This part comprises a total of not less than 12 hours dual flight instruction on a helicopter including:

(a) pre-flight operations~~,~~**:** mass and balance determination**,** helicopter inspection and servicing;

(b) aerodrome and traffic pattern operations, collision avoidance and procedures;

(c) control of the helicopter by external visual reference;

(d) take-offs, landings, hovering, look–out turns and normal transitions from and to the hover;

(e) emergency procedures, basic auto-rotations, simulated engine failure, ground resonance recovery if relevant to type.

4.2 Phase 2

Flight exercises until general handling and day VFR navigation progress check conducted by a flight instructor not connected with the applicant**'**~~'~~s training, and basic instrument progress check. This part comprises a total flight time of not less than 123 hours including 73 hours of dual instruction flight time, 15 hours of solo flight and 35 hours flown as SPIC. The instruction and testing contain the following:

(a**)** sideways and backwards flight, turns on the spot;

(b**)** incipient vortex ring recovery;

(c**)** touchdown/advanced auto-rotations and simulated engine-off landings, practice forced landings. Simulated equipment malfunctions and emergency procedures relating to malfunctions of engines, controls, electrical and hydraulic circuits;

(d**)** steep turns;

(e**)** transitions, quick stops, out of wind manoeuvres, sloping ground landings and take-offs;

(f**)** limited power and confined area operations including selection of and low level operations to and from unprepared sites;

(g**)** flight by sole reference to basic flight instruments, including completion of a 180°~~o~~ turn and recovery from unusual attitudes to simulate inadvertent entry into cloud;

(h**)** cross-country flying by external visual reference, dead reckoning and radio navigation aids, diversion procedures;

(i**)** aerodrome and traffic pattern operations at different aerodromes;

(j**)** operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures, radio telephony procedures and phraseology;

(k**)** application of meteorological briefing arrangements, evaluation of weather conditions for flight and use of Aeronautical Information Services (AIS);

~~l. general handling progress test conducted by a delegated instructor not connected with the applicant's training;m~~

(l) night flight including take-offs and landings as pilot-in-command;

~~n. general handling, day VFR navigation and basic instrument flying progress checks in accordance with Appendix 4 to Part-FCL, conducted by a flight instructor not connected with the applicants training.~~

(m) general handling, day VFR navigation and basic instrument flying progress checks in accordance with Appendix 4 to Part-FCL, conducted by a flight instructor not connected with the applicant's training.

K~~I~~. CPL modular course — Helicopters

1. The CPL modular course should last 18 months. This period may be extended where additional training is provided by the approved training organisation. The flight instruction and skill test need to be completed within the period of validity of the pass in the theoretical examinations.

2. An approved course should include formal classroom work and may include the use of facilities such as interactive video, slide/tape presentation, learning carrels and computer-based training and other media distance learning (correspondence) courses as approved by the authority. Approved distance learning (correspondence) courses may also be offered as part of the course.

THEORETICAL KNOWLEDGE

3. The 250 hours of instruction can include classroom work, interactive video, slide/tape presentation, learning carrels, computer-based training, and other media as approved by the authority, in suitable proportions.

FLYING TRAINING

4. The flying instruction comprises the following items. The flight time allocated to each exercise is at the discretion of the flight instructor, provided **that** at least 5 hours flight time is allocated to cross-country flying.

Visual flight

5. Within the total of dual flight instruction time, the applicant may have completed during the visual phase up to 5 hours in a helicopter FS or FTD 2, 3 or FNPT II, III.

(a) Pre-flight operations: mass and balance calculations, helicopter inspection and servicing**;**

(b) **l**evel flight speed changes, climbing, descending, turns, basic auto-rotations, use of checklist, collision avoidance, checking procedures**;**

(c) **t**ake-offs and landings, traffic pattern, approach, simulated engine failures in the traffic pattern. Sideways and backwards flight and spot turns in the hover**;**

(d) **r**ecovery from incipient vortex ring condition**;**

(e) **a**dvanced auto-rotations covering the speed range from low speed to maximum range and manoeuvre in auto-rotations (180**°,** 360**°** and 'S' turns), simulated engine**-**off landings**;**

(f) **s**election of emergency landing areas, auto-rotations following simulated emergencies to given areas. Steep turns at 30**°** and 45**°**~~º~~bank**;**

(g) **m**anoeuvres at low level and quick-stops**;**

(h) **l**andings, take-offs and transitions to and from the hover when heading out of wind**;**~~.~~

(i) **l**andings and take-offs from sloping or uneven ground**;**

(j) **l**andings and take-offs with limited power**;**

(k) **l**ow level operations into and out of confined landing sites**;**

(l) **c**ross-country flying using dead reckoning and radio navigation aids. Flight planning by the applicant; filing of ATC flight plan; evaluation of weather briefing documentation, NOTAM**,** etc; radiotelephony procedures and phraseology; positioning by radio navigation aids; operation to, from and transiting controlled aerodromes, compliance with air traffic services procedures for VFR flights, simulated radio communication failure, weather deterioration, diversion procedures; location of an off airfield landing site and simulated approach.

Basic Instrument Flight

6. A maximum of 5 hours of the following exercises may be performed in a**n** FS or FTD or FNPT. Flight training should be carried out in VMC using a suitable means of simulating IMC for the student.

(a) Instrument flying without external visual cues. Level flight performing speed changes, maintaining flight altitude (level, heading) turns in level flight at rate 1 and 30° bank, left and right; roll-out on predetermined headings**;**

(b) repetition of exercise (m); additionally climbing and descending, maintaining heading and speed, transition to horizontal flight; climbing and descending turns**;**

(c) **r**epetition of exercise (m); and recovery from unusual attitudes**;**

(d) **r**adio navigation**;**

(e) **r**epetition of exercise (m); and turns using standby magnetic compass and standby artificial horizon (if fitted).

GM No 1 to Appendix 3

Overview of Synthetic Flight Training Credits for Dual Instruction in Helicopter Flying Training Courses

		ATPL(H)/IR Integrated			*FSTD Credits*
	Dual	**Solo**		**Total**	**FS; FTD; FNPT**
Visual, including ME T/R training	**75 hrs**	**15 hrs**	**40 hrs**	**130 hrs**	**30 hrs FS C/D level or** **25 hrs FTD 2,3 or** **20 hrs FNPT II, III**
Basic Instrument	**10 hrs**	**-**	**-**	**10 hrs**	**5 hrs FTD 1; FNPT 1**
Instrument Rating training	**40 hrs**	**-**		**40 hrs**	**20 hrs FS; FTD, 2,3 ;FNPT II, III or** **5 hrs FTD 1; FNPT I**
MCC	**15 hrs**	**-**	**-**	**15 hrs**	**15hrs FS; FTD2,3(MCC) ;FNPT II,III; (MCC)**
Total	**140 hrs**	**55 hrs**		**195 hrs**	**65 hrs FS or** **60 hrs FTD 2, 3 or** **55 hrs FNPT II, III or** **10 hrs FTD 1; FNPT I**
		ATPL(H)/VFR Integrated			
	Dual	**Solo**	**SPIC**	**Total**	**FS; FTD; FNPT**
Visual including ME T/R training	**75 hrs**	**15 hrs**	**40 hrs**	**130 hrs**	**30 hrs FS C/D level or** **25 hrs FTD 2,3 or** **20 hrs FNPT II, III**
Basic instrument	**10 hrs**	**-**	**-**	**10 hrs**	**5 hrs FTD 1; FNPT I**
MCC / VFR	**10 hrs**	**-**	**-**	**10 hrs**	**10hrs FS, FTD 2,3(MCC); FNPT ,II,III (MCC)**
Total	**95 hrs**	**55 hrs**		**150 hrs**	**40 hrs FS or** **35 hrs FTD 2,3 or** **30 hrs FNPT II, III or** **5 hrs FTD 1; FNPT I**
		CPL(H)/IR Integrated			
	Dual	**Solo**	**SPIC**	**Total**	**FS; FTD; FNPT**
Visual including ME T/R training	**75 hrs**	**15 hrs**	**40hrs**	**130 hrs**	**30 hrs FS C/D level or** **25 hrs FTD 2, 3 or** **20 hrs FNPT II, III**
Basic instrument	**10 hrs**	**-**	**-**	**10 hrs**	**5 hrs FTD; FNPT I**
Instrument Rating training	**40 hrs**	**-**		**40 hrs**	**20 hrs FS; FTD 2, 3 ; FNPT II, III or** **5 hrs FTD 1; FNPT I**
Total	**125 hrs**	**55 hrs**		**180 hrs**	**50 hrs FS C/D level or** **45 hrs FTD 2, 3 or** **40 hrs FNPT II, III,** **10 hrs FTD1; FNPT I**

		CPL(H) Integrated			
	Dual	**Solo**	**SPIC**	**Total**	**FS; FTD; FNPT**
Visual	**75 hrs**	**15 hrs**	**35 hrs**	**125 hrs**	**30 hrs FS C/D level or 25 hrs FTD 2, 3 or 20 hrs FNPT II, III**
Basic instrument	**10 hrs**	**-**	**-**	**10 hrs**	**5 hrs FS; FTD 1,2,3;FNPT I,II,III**
Total	**85 hrs**	**50 hrs**		**135 hrs**	**35 hrs FS or 30 hrs FTD 2,3 or 25 hrs FNPT II, III or 5 hrs FTD 1;FNPT I**
		CPL(H) Modular			
	Dual	**Solo**	**SPIC**	**Total**	**FS; FTD; FNPT**
Visual	**20 hrs**	**-**	**-**	**20 hrs**	**5 hrs FS, FTD 2,3;FNPT II,III**
Basic instrument	**10 hrs**	**-**	**-**	**10 hrs**	**5 hrs FS, FTD 1,2,3;FNPT I,II,III**
Total	**30 hrs**	**-**	**-**	**30 hrs ***	**10 hrs FS, FTD 2,3; FNPT II, III or 5 hrs FTD 1;FNPT I**
		IR(H) Modular			
	Dual	**Solo**	**SPIC**	**Total**	**FS; FTD; FNPT**
Single Engine	**50 hrs**	**-**	**-**	**50 hrs**	**35 hrs FS; FTD 2,3; FNPT II, III or 20 hrs FTD 1; FNPT I**
Multi Engine	**55 hrs**	**-**	**-**	**55 hrs**	**40 hrs FS; FTD 2,3 FNPT II, III or 20 hrs FTD1; FNPT I**
		MCC(H) Modular			
	Dual	**Solo**	**SPIC**	**Total**	**FS; FTD; FNPT**
MCC / VFR	**15 hrs**	**-**	**-**	**15 hrs**	**15hrs FS; FTD 2,3(MCC); FNPT,II,III(MCC)**
MCC / IR	**5 hrs**	**-**	**-**	**5 hrs**	**5 hrs FS; FTD 2,3(MCC); FNPT,II,III(MCC)**
MCC(VFR+IR)	**20 hrs**	**-**	**-**	**20 hrs**	**20 hrs FS; FTD 2,3(MCC); FNPT,II,III(MCC)**

Note:

Credits in FNPT I means, credits in an aeroplane FNPT I or in a helicopter FNPT I or in an aeroplane.

AMC No 1 to Appendix 6

Modular training course for IR

1. The theoretical knowledge instruction may be given at an approved training organisation conducting theoretical knowledge instruction only, in which case the Head of Training of that organisation should supervise that part of the course.

2. The 150 hours of theoretical knowledge instruction can include classroom work, inter–active video, slide/tape presentation, learning carrels, computer––based training, and other media as approved by the authority, in suitable proportions. Approved distance learning (correspondence) courses may also be offered as part of the course.

AMC No 2 to Appendix 6

Modular training course for IR — Aeroplanes

BASIC INSTRUMENT FLIGHT MODULE TRAINING COURSE

1. This 10-hour module is focused on the basics of flying by sole reference to instruments, including limited panel and unusual attitude recovery.

2. All exercises may be performed in a**n** FNPT I or II or a flight simulator, for a maximum of 5 hours. If instrument flight training is in VMC, a suitable means of simulating IMC for the student should be used.

3. A BITD may be used for the following exercises**:** 1, 2, 3, 4, 6 and 8.

   The use of the BITD is subject to the following:

   — the training should be complemented by exercises on an aeroplane**,**

   — the record of the parameters of the flight must be available**,** and

   — an FI(A) or IRI(A)- should conduct the instruction.

EXERCISES

1**.**	Basic instrument flying without external visual cues. Horizontal flight; power changes for acceleration or deceleration, maintaining straight and level flight; turns in level flight with 15° and 25° bank, left and right; roll-out onto predetermined headings.	0:30
2**.**	Repetition of exercise 1; additionally climbing and descending, maintaining heading and speed, transition to horizontal flight; climbing and	0:45

	descending turns.	
3.	Instrument pattern: (a) start exercise, decelerate to approach speed, flaps into approach configuration; (b) initiate standard turn (left or right); (c) roll out on opposite heading, maintain new heading for 1 minute; (d) standard turn, gear down, descend 500 ft/min; (e) roll out on initial heading, maintain descent (500 ft/min) and new heading for 1 minute; (f) transition to horizontal flight, 1.000 ft below initial flight level; (g) initiate go-around; and (h) climb at best rate of climb speed.	0:45
4.	Repetition of exercise 1 and steep turns with 45° bank; recovery from unusual attitudes.	0:45
5.	Repetition of exercise 4.	0:45
6.	Radio navigation using VOR, NDB or, if available, VDF; interception of predetermined QDM, QDR.	0:45
7.	Repetition of exercise 1 and recovery from unusual attitudes.	0:45
8.	Repetition of exercise 1, turns, -level change and recovery from -unusual attitudes with simulated failure of the artificial horizon and/or directional gyro.	0:45

9. Recognition of, and recovery from, incipient and full stalls. 0:45

10. Repetition of exercises 6, 8 and 9. 3:30

CERTIFICATE OF COMPLETION OF BASIC INSTRUMENT FLIGHT MODULE

CERTIFICATE OF COMPLETION OF BASIC INSTRUMENT FLIGHT MODULE

Pilot's last name:			First name(s):	
Type of licence:			Number:	State:
Flight training hours performed on single-engine aeroplane:		OR	Flight training hours performed on multi-engine aeroplane:	
Flight training hours performed in an FSTD (maximum 5 hours):				
	Signature of applicant:			

The satisfactory completion of Basic Instrument Flight Module according to requirements is certified below:

TRAINING			
Basic Instrument Flight module training received during period:			
from:	to:	at:	FTO
Location and date:		Signature of Head of Training:	
Type and number of licence and State of issue:		Name in capital letters of authorised instructor:	

AMC No 3 to Appendix 6

Modular training course for IR — Airships

BASIC INSTRUMENT FLIGHT MODULE TRAINING COURSE

This 10-hour module is focused on the basics of flying by sole reference to instruments, including limited panel and unusual attitude recovery.

All exercises may be performed in a**n** FNPT I or II or a flight simulator, for a maximum of 5 hours. If instrument flight training is in VMC, a suitable means of simulating IMC for the student should be used.

A BITD may be used for the following exercises**:** 1, 2, 3, 4, 6 and 8.

The use of the BITD is subject to the following:

— the training should be complemented by exercises on an airship~~;~~**,**

— the record of the parameters of the flight must be available~~;~~**,** and

— a**n** FI(As) or IRI(As)- should conduct the instruction.

EXERCISES

1**.** Basic instrument flying without external visual cues. Horizontal flight; maintaining straight and level flight; turns in level flight, left and right; roll-out onto predetermined headings. — 0:30

2**.** Repetition of exercise 1; additionally climbing and — 0:45

descending, maintaining heading and speed, transition to horizontal flight; climbing and descending turns.

3. Instrument pattern: 0:45

   (a) start exercise, decelerate to approach speed, approach configuration;

   (b) initiate standard turn (left or right);

   (c) roll out on opposite heading, maintain new heading for 1 minute;

   (d) standard turn, descend with given rate (e.g. 500 ft/min);

   (e) roll out on initial heading, maintain descent (e.g. 500 t/min) and new heading for 1 minute;

   (f) transition to horizontal flight (e.g. 1000 ft below initial level)~~,~~;

   (g) initiate go-around; and

   (h) climb at best rate of climb speed.

4. Repetition of exercise 1; recovery from unusual attitudes. 0:45

5. Repetition of exercise 4. 0:45

6. Radio navigation using VOR, NDB or, if available, VDF; interception of predetermined QDM, QDR. 0:45

7. Repetition of exercise 1 and recovery from unusual attitudes 0:45

8. Repetition of exercise 1, turns, level change and recovery from unusual attitudes with simulated 0:45

failure of the artificial
horizon and/or directional gyro.

9**.** Repetition of exercises 6 and 8**.** 4:15

CERTIFICATE OF COMPLETION OF BASIC INSTRUMENT FLIGHT MODULE (A**s**~~S~~)

CERTIFICATE OF COMPLETION OF BASIC INSTRUMENT FLIGHT MODULE

Pilot’~~'~~s last name:		First name**(**s**)**:	
Type of licence:		Number:	State:
Flight training hours performed on airship:			
Flight training hours performed in a**n** FSTD **(**maximum 5 hours):			
	Signature of applicant:		

The satisfactory completion of Basic Instrument Flight Module according to requirements is certified below:

TRAINING			
Basic Instrument Flight module training received during period:			
from:	to:	at:	FTO
Location and date:		Signature of Head of Training:	
Type and number of licence and State of issue:		Name in capital letters of authorised instructor:	

GM No 1 to Appendix 7

IR skill test

For the purpose of the skill test, a multi-engine centreline thrust aeroplane is considered a single-engine aeroplane.

AMC No 1 to Appendix 7

BASIC LAPL/LAPL/BPL/SPL/PPL/CPL/IR skill test/proficiency check application and report form

APPLICATION AND REPORT FORM BASIC LAPL/LAPL/BPL/SPL/PPL/CPL/IR SKILL TEST AND PROFICIENCY CHECK			
Applicant's last name:			**BASIC LAPL:** ☐
Applicant's first name/s:			**LAPL: A** ☐ **H** ☐ **B** ☐ **S** ☐
Signature of applicant:			**BPL:** ☐ **SPL:** ☐
Type of licence*:			**PPL: A** ☐ **H** ☐ **As** ☐
Licence number*:			**CPL: A** ☐ **H** ☐ **As** ☐
State:			**IR: A** ☐ **H** ☐**As** ☐
1	**Details of the flight**		
Group/Class/Type of aircraft:		**Registration:**	
Aerodrome/site:	**Take-off time:**	**Landing time:**	**Flight time:**
			Total flight time:
2	**Result of the test**		
Skill test details:			
Pass ☐	**Fail** ☐	**Partial pass** ☐	
3	**Remarks**		

Location and date:

Examiner’s certificate number (if applicable):	**Type and number of licence:**
Signature of examiner:	**Name in capital letters:**

**** if applicable***

~~A. Aeroplanes~~

~~APPLICATION AND REPORT FORM FOR THE IR(A) SKILL TEST~~			
~~Applicant’s last name:~~		~~First name:~~	
~~Licence held:~~		~~Number:~~	
~~1~~	**~~Details of the flight~~**		
~~Class/Type of aeroplane:~~		~~Departure aerodrome:~~	
~~Registration:~~		~~Destination aerodrome:~~	
~~Block time off:~~		~~Block time on:~~	
~~Total block time:~~		~~Take-off time:~~	
~~2~~	**~~Result of the test~~** ~~*delete as necessary~~		
~~Pass*~~	~~Fail*~~	~~Partial pass *~~	
~~3~~	**~~Remarks~~**		
~~Location and date:~~		~~Type and number of FE’s licence:~~	
~~Signature of FE:~~		~~Name of FE, in capitals:~~	

~~B. Helicopters~~

~~APPLICATION AND REPORT FORM FOR THE IR(H) SKILL TEST~~			
~~Applicant's last name:~~		~~First names:~~	
~~Licence held:~~		~~Number:~~	
~~State of licence issue in which test performed:~~		~~Signature:~~	
~~1~~	~~**Details**~~		
~~Type of helicopter:~~		~~Registration:~~	
~~2~~	~~**Result of the test**~~ ~~**delete as necessary*~~		
~~Passed*~~	~~Failed*~~	~~Partial pass*~~	
~~3~~	~~**Remarks**~~		
~~Location and date:~~		~~Type and number of FE's licence:~~	
~~Signature of FE:~~		~~Name of FE, in capitals:~~	

~~C. Airships~~

~~APPLICATION AND REPORT FORM FOR THE IR(AS) SKILL TEST~~			
~~Applicant's last name:~~		~~First name:~~	
~~Licence held:~~		~~Number:~~	
~~1~~	~~**Details of the flight**~~		
~~Class/Type of airship:~~		~~Departure aerodrome:~~	
~~Registration:~~		~~Destination aerodrome:~~	
~~Block time off:~~		~~Block time on:~~	
~~Total block time:~~		~~Take-off time:~~	
~~2~~	~~**Result of the test**~~ ~~*delete as necessary~~		
~~Passed*~~	~~Failed *~~	~~Partial pass *~~	
~~3~~	~~**Remarks**~~		
~~Location and date:~~		~~Type and number of FE's licence:~~	
~~Signature of FE:~~		~~Name of FE, in capitals:~~	

AMC No 1 to Appendix 9

ATPL/MPL/type and class rating/training/skill test/proficiency check application and report form

APPLICATION AND REPORT FORM ATPL/MPL/TYPE RATING/TRAINING/SKILL TEST AND PROFICIENCY CHECK AEROPLANES (A) AND HELICOPTERS (H)			
Applicant's last name:	**Aircraft:**	**SE-SP: A ☐ H ☐**	**ME-SP: A ☐ H ☐**
Applicant's first name(s):		**SE-MP: A ☐ H ☐**	**ME-MP: A ☐ H ☐**
Signature of applicant:	**Operations:**	**SP ☐**	**MP ☐**
Type of licence held:	**Checklist:**	**Training record: ☐**	**Type rating: ☐**
Licence number:		**Skill test: ☐**	**Class rating: ☐**
		IR: ☐	
State of licence issue:		**Proficiency check: ☐**	**ATPL: ☐ MPL: ☐**

1	**Theoretical training for the issue of a type/class rating performed during period**		
From:	**To:**	**At:**	
Mark obtained:	**% (Pass mark 75%):**	**Type and number of licence:**	
Signature of instructor:		**Name in capital letters:**	
2	**FSTD**		
FSTD (aircraft type):	**Three or more axes: Yes ☐ No ☐**	**Ready for service and used:**	
FSTD manufacturer:	**Motion/System:**	**Visual aid: Yes ☐ No ☐**	
FSTD operator:		**FSTD ID Code:**	
Total training time at the controls:		**Instrument approaches at aerodromes to a decision altitude/height of:**	
Location/date/time:		**Type and number of licence:**	
Type Rating Instructor ☐	**Class Rating Instructor ☐**	**……………………………… Instructor ☐**	
Signature:		**Name in capital letters:**	
3	**Flight training**		
Type of aircraft:	**Registration:**	**Flight time at the controls:**	
Take-offs:	**Landings:**	**Training aerodromes/sites (take-offs, approaches and landings):**	
Take-off time:		**Landing time:**	
Location and date:		**Type and number of licence held:**	
Type Rating ☐ Class Rating ☐ Instructor ☐			
Signature:		**Name in capital letters:**	
4	**Skill Test ☐**	**Proficiency Check ☐**	

Skill Test Details:			
Aerodrome/site:		**Total flight time**	
Take-off time		**Landing time**	
Pass ☐	**Fail** ☐	**Reason(s)why, if failed:**	
Location and date:		**SIM/Aircraft Reg:**	
Examiner's certificate number (if applicable):		**Type and number of licence:**	
Signature of examiner:		**Name in capital letters:**	

~~A. Multi-engine multi-pilot aeroplanes~~

~~APPLICATION AND REPORT FORM~~			
~~Applicant's last name:~~		~~First names:~~	
~~Type of licence:~~		~~Number:~~	
~~State:~~	~~Type rating as pilot-in-command/co-pilot*~~	~~Signature of applicant:~~	
~~Multi-engine aeroplane:~~		~~Proficiency check:~~	
~~Training record:~~		~~Type rating:~~	
~~Skill test:~~		~~ATPL(A):~~	

~~Satisfactory completion of Type rating – training according to requirements is certified below:~~

~~1~~	~~Theoretical training for the issue of a type rating performed during period~~				
~~from:~~	~~To:~~	~~at:~~			
~~mark obtained:~~	~~% (Pass mark 75%):~~	~~Type and number of licence:~~			
~~Signature of instructor:~~		~~Name in capital letters:~~			
~~2~~	~~Simulator (aeroplane type):~~	~~Three or more axes:~~	~~YES~~	~~NO~~	~~Ready for service and used~~
~~Simulator manufacturer:~~		~~motion / system:~~			
~~Simulator operator:~~		~~Visual aid:~~	~~YES *~~	~~NO*~~	
~~Total training time at the controls:~~					
~~Instrument approaches at aerodromes:~~					
~~to a decision altitude/height of:~~					
~~Location/date/time:~~		~~Signature of type rating instructor/examiner*:~~			
~~Type and No of licence:~~		~~Name in capital letters:~~			
~~3~~	~~Flight training:~~				
~~Type of aeroplane:~~	~~Registration:~~	~~Flight time at the controls:~~			

~~Take-offs:~~		~~Landings:~~		~~Training aerodromes/sites (take-offs, approaches and landings):~~	
~~Location and date:~~				~~Signature of type rating instructor/examiner*:~~	
~~Type and No of licence:~~				~~Name in capital letters:~~	
~~4~~	~~Skill test/Proficiency Check Remark: if the applicant failed the examiner indicates the reasons why~~	~~*Pass*~~	~~*Fail*~~	~~SIM/Aircraft Reg:~~	
~~Location and date~~				~~Type and number of licence~~	
~~Signature of authorised examiner*~~				~~Name in capital letters~~	

~~** delete as necessary*~~

~~B. Single-engine and multi-engine single-pilot aeroplanes~~

~~APPLICATION AND REPORT FORM~~			
~~Applicant's last name:~~		~~First name:~~	
~~Type of licence:~~		~~Number:~~	~~State:~~
~~Type of aeroplane:~~	~~Registration:~~	~~Signature of applicant:~~	

~~I hereby certify proper completion of the theoretical and practical instruction in accordance with the requirements:~~

~~1~~	~~Single-engine / multi-engine / single-pilot Aeroplanes~~				
~~Type rating:~~		+	~~Skill test:~~		+
~~Class rating:~~		+	~~Proficiency check:~~		+
~~Training record:~~		+			
~~2~~	~~Flight training:~~				
~~Flight time:~~		~~Take-offs:~~	~~Landings:~~		
~~Training aerodromes (take-offs, approaches and landings):~~					
~~Location and date:~~			~~Signature of TRI/CRI*:~~		
~~Type and No of licence:~~			~~Name in capital letters:~~		
~~3~~	~~Skill test~~				
~~Aerodrome:~~		~~Take-off time:~~		~~Landing time:~~	
~~Skill test/Proficiency Check Remark: if the applicant failed the examiner indicates the reasons why~~		~~*Pass*~~	~~*Fail*~~	~~SIM/Aircraft Reg:~~	
~~Location and date:~~			~~Type and number of licence:~~		
~~Signature of authorised~~			~~Name in capital~~		

~~examiner*:~~		~~letters:~~	

~~** delete as necessary*~~

~~C. Multi-pilot helicopters~~

~~APPLICATION AND REPORT FORM~~			
~~Applicant's last name~~		~~First name~~	
~~Type of licence~~		~~Number~~	
~~State~~	~~Type rating as pilot in command/co-pilot*~~	~~Signature of applicant~~	
~~Multi-engine helicopter~~		~~Proficiency check~~	
~~Training record~~		~~Type rating~~	
~~Skill test~~		~~ATPL(H)~~	

~~*Satisfactory completion of Type rating -training according to requirements is certified below:*~~

~~1~~	~~Theoretical training for the issue of a type rating performed during period~~				
~~from:~~	~~to:~~	~~at:~~			
~~mark obtained:~~	~~% (Pass mark 75%):~~	~~Type and number of licence:~~			
~~Signature of instructor~~		~~Name in capital letters~~			
~~2~~	~~Flight simulator (helicopter type):~~	~~Three or more axes motion / system~~	~~YES *~~	~~NO*~~	~~Ready for service and used~~
~~Flight simulator manufacturer:~~					
~~Flight simulator operator:~~		~~Visual aid:~~	~~YES *~~	~~NO*~~	
~~Total training time at the controls:~~					
~~Instrument approaches at aerodromes to a decision altitude of:~~					
~~Location/date/time:~~		~~Signature of type rating instructor/examiner*:~~			
~~Type and No of licence:~~		~~Name in capital letters:~~			
~~3~~	~~Flight training:~~				
~~Type of helicopter:~~	~~Registration:~~	~~Flight time at the controls:~~			
~~Take-offs~~	~~Landings:~~	~~Training aerodromes/sites (take-offs, approaches and landings)~~			
~~Location and date:~~		~~Signature of type rating instructor/examiner*:~~			
~~Type and No of licence~~		~~Name in capital letters~~			

~~4~~	~~Skill test/Proficiency Check Remark: if the applicant failed the examiner indicates the reasons why~~	~~*Pass**~~	~~*Fail**~~	~~SIM/Aircraft Reg:~~
~~Location and date~~			~~Type and number of licence~~	
~~Signature of authorised examiner*~~			~~Name in capital letters~~	

~~**delete as necessary*~~

~~D. Single-engine and multi-engine single-pilot helicopters~~

~~APPLICATION AND REPORT FORM~~			
~~Applicant's last name~~		~~First name~~	
~~Type of licence~~		~~Number~~	
~~State~~		~~Signature of applicant~~	
~~Helicopter~~		~~Proficiency check~~	
~~Training record~~		~~Type rating~~	
~~Skill test~~			

~~*Satisfactory completion of Type rating -training according to requirements is certified below:*~~

~~1~~	~~Theoretical training for the issue of a type rating performed during period~~				
~~from:~~	~~to:~~	~~at:~~			
~~mark obtained:~~	~~% (Pass mark 75%):~~	~~Type and number of licence:~~			
~~Signature of instructor~~		~~Name in capital letters~~			
~~2~~	~~Flight simulator (helicopter type):~~	~~Three or more axes~~	~~YES *~~	~~NO*~~	~~Ready for service and used~~
~~Flight simulator manufacturer:~~		~~motion / system~~			
~~Flight simulator operator:~~		~~Visual aid:~~	~~YES *~~	~~NO*~~	
~~Total training time at the controls:~~					
~~Instrument approaches at aerodromes to a decision altitude of:~~					
~~Location/date/time:~~		~~Signature of type rating instructor/examiner*:~~			
~~Type and No of licence:~~		~~Name in capital letters:~~			
~~3~~	~~Flight training:~~				
~~Type of helicopter:~~	~~Registration:~~	~~Flight time at the controls:~~			
~~Take-offs~~	~~Landings:~~	~~Training aerodromes/sites (take-offs, approaches and landings)~~			
~~Location and date:~~		~~Signature of type rating instructor/examiner*:~~			
~~Type and No of licence~~		~~Name in capital letters~~			
~~4~~	~~Skill test/Proficiency Check Remark: if the applicant failed the examiner indicates the reasons why~~	~~*Pass**~~	~~*Fail**~~	~~SIM/Aircraft Reg:~~	
~~Location and date~~		~~Type and number of licence~~			
~~Signature of authorised examiner*~~		~~Name in capital letters~~			

~~**delete as necessary*~~

AMC No 2 to Appendix 9

Training, Skill test and proficiency check – single pilot aeroplanes

Section 3.B of the training and skill test/proficiency check content for single-pilot aeroplanes included in Appendix 9.B should include training on a circling approach, after an IFR approach.

~~AMC No 1 to Appendix 12~~

~~Skill test and proficiency check form for the flight instructor certificate~~

~~A. Aeroplanes~~

~~APPLICATION AND REPORT FORM FOR THE INSTRUCTOR SKILL TEST~~			
~~1~~ ~~Applicants personal particulars:~~			
~~Applicant's last name:~~		~~First names:~~	
~~Date of Birth:~~		~~Tel (Home):~~	~~Tel (Work):~~
~~Address:~~		~~Country:~~	

~~2~~	**~~Licence Details~~**		
~~Licence type:~~		~~Number:~~	
~~Class ratings included in the licence:~~		~~Exp. Date:~~	
~~Type ratings included in the licence:~~	~~1.~~		
	~~2.~~		
	~~3.~~		
	~~4.~~		
	~~5.~~		
~~Other ratings included in the licence:~~	~~1.~~		
	~~2.~~		
	~~3.~~		
	~~4.~~		
	~~5.~~		

~~3~~ ~~Pre-course flying experience~~				
~~TOTAL FLYING HOURS~~	~~PIC hours~~	~~SINGLE-ENGINE (PISTON) preceding 6 months~~	~~INSTRUMENT FLIGHT INSTRUCTION~~	~~CROSS-COUNTRY hours~~
~~4~~ ~~Pre-entry flight test~~				

~~I recommend ………………………………for the Flight Instructor Course.~~

~~Name of ATO:~~	~~Date of flight test:~~
~~Name of FI conducting the test (Block capitals):~~	
~~Licence number:~~	
~~Signature:~~	

~~5~~	**~~Declaration by the applicant~~**

~~I have received a course of training in accordance with the syllabus approved by the Authority for the:~~
~~(Tick as applicable)~~

~~Flight Instructor Certificate FI(A)~~		~~Instrument Rating Instructor Certificate (IRI(A))~~		~~Class Rating Instructor Certificate for multi- engine SPA – (CRI(A) ME SPA)~~	

~~Applicant’s name:~~ ~~(Block Letters)~~	~~Signature:~~

~~6~~	**~~Declaration by the chief flight instructor~~**

~~I certify that ………………………………… has satisfactorily completed an approved course of training for the~~

~~Flight Instructor Certificate FI(A)~~		~~Instrument Rating Instructor Certificate (IRI(A))~~		~~Class Rating Instructor Certificate for multi- engine SPA – (CRI(A) ME SPA)~~	

~~in accordance with the relevant syllabus approved by the Authority.~~

~~Flying hours during the course:~~
~~Aeroplane/s, simulator/s or flight and navigation procedure trainers used :~~
~~Name of CFI:~~
~~Signature:~~
~~Name of ATO:~~

~~7~~	**~~Flight instructor examiner’s certificate~~**

~~I have tested the applicant according to Appendix 12 to Part-FCL~~

~~A – FLIGHT INSTRUCTOR EXAMINER’S ASSESSMENT in case of partial pass:~~

~~Theoretical oral examination:~~		~~Skill test:~~	
~~Passed~~	***~~Failed~~***	***~~Passed~~***	***~~Failed~~***

	~~I recommend further flight/ground training with a FI instructor before re-test~~

	~~I do not consider further flight/theoretical instruction necessary before re-test~~ ~~*Tick as applicable*~~
~~**B – FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT:**~~	
	~~Flight Instructor certificate~~
	~~Instrument Instructor certificate~~
	~~Class Rating Instructor Certificate for multi-engine SPA~~ ~~*Tick as applicable*~~
~~FIE's name (block letters):~~	
~~Signature:~~	
~~Licence number:~~	~~Date:~~

~~B. Helicopters~~

~~**APPLICATION AND REPORT FORM FOR THE FI(H) SKILL TEST**~~				
~~**1**~~	~~**Applicants personal particulars:**~~			
~~Applicant's last name:~~		~~First names:~~		
~~Date of Birth:~~		~~Tel (Home):~~	~~Tel (Work):~~	
~~Address:~~		~~Country:~~		
~~**2**~~	~~**Licence Details**~~			
~~Licence type:~~		~~Number:~~		
		~~Exp. Date:~~		
~~Type ratings included in the licence:~~	~~1.~~			
	~~2.~~			
	~~3.~~			
	~~4.~~			
	~~5.~~			
~~Other ratings included in the licence:~~	~~1.~~			
	~~2.~~			
	~~3.~~			

	~~4.~~
	~~5.~~

~~3~~	**~~Pre-course flying experience~~**		
~~IR (hours)~~	~~PIC (hours)~~	~~TOTAL (hours)~~	~~CROSS-COUNTRY (hours)~~

~~4~~	**~~Pre-entry flight test~~**
~~I recommend ....for the Flight Instructor Course.~~	
~~Name of ATO:~~	~~Date of flight test:~~
~~Name of FI conducting the test (Block capitals):~~	
~~Licence number:~~	
~~Signature:~~	

~~5~~	**~~Declaration by the applicant~~**				
~~I have received a course of training in accordance with the syllabus approved by the Authority for the:~~ *~~(Tick as applicable)~~*					
~~Flight Instructor Certificate FI(H)~~		~~Instrument Rating Instructor Certificate (IRI(H))~~			
~~Applicant's name: (Block Letters)~~		~~Signature:~~			

~~6~~	**~~Declaration by the chief flight instructor~~**				
~~I certify that .... has satisfactorily completed an approved course of training for the~~					
~~Flight Instructor Certificate FI(H)~~		~~Instrument Rating Instructor Certificate (IRI(H))~~			
~~in accordance with the relevant syllabus approved by the Authority.~~					
~~Flying hours during the course:~~					
~~Helicopter/s, flight simulator/s or flight and navigation procedure trainers used :~~					
~~Name of CFI:~~					

~~Signature:~~			
~~Name of ATO:~~			
~~7~~	**~~Flight instructor examiner's certificate~~**		
~~I have tested the applicant according to Appendix 12 to Part-FCL~~			
~~A – FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT in case of partial pass:~~			
~~Theoretical oral examination:~~		~~Skill test:~~	
~~Passed~~	***~~Failed~~***	***~~Passed~~***	***~~Failed~~***
	~~I recommend further flight/ground training with a FI instructor before re-test~~		
	~~I do not consider further flight/theoretical instruction necessary before re-test~~ *~~Tick as applicable~~*		
~~B – FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT:~~			
	~~Flight Instructor certificate~~		
	~~Instrument Instructor certificate~~ *~~Tick as applicable~~*		
~~FIE's name (block letters):~~			
~~Signature:~~			
~~Licence number:~~		~~Date:~~	

~~C. Airships~~

~~APPLICATION AND REPORT FORM FOR THE INSTRUCTOR SKILL TEST (AIRSHIPS)~~			
~~1~~ **~~Applicants personal particulars:~~**			
~~Applicant's last name:~~		~~First names:~~	
~~Date of Birth:~~		~~Tel (Home):~~	~~Tel (Work):~~
~~Address:~~		~~Country:~~	
~~2~~ **~~Licence Details~~**			
~~Licence type:~~		~~Number:~~	
~~Type ratings included in the licence:~~	~~1.~~	~~Exp. Date:~~	
	~~2.~~		
	~~3.~~		

	~~4.~~

~~3~~	**~~Pre-course flying experience~~**

~~TOTAL FLYING HOURS~~	~~PIC hours~~	~~PIC hours holding a CPL(As)~~		

~~4~~	**~~Pre-entry flight test~~**

~~I recommend ....for the Flight Instructor Course.~~

~~Name of ATO:~~	~~Date of flight test:~~
~~Name of FI conducting the test (Block capitals):~~	
~~Licence number:~~	
~~Signature:~~	

~~5~~	**~~Declaration by the applicant~~**

~~I have received a course of training in accordance with the syllabus approved by the Authority for the:~~
~~(Tick as applicable)~~

~~Flight Instructor Certificate FI(As)~~		~~Instrument Rating Instructor Certificate (IRI(As))~~		
~~Applicant's name:~~ ~~(Block Letters)~~			~~Signature :~~	

~~6~~	**~~Declaration by the chief flight instructor~~**

~~I certify that .... has satisfactorily completed an approved course of training for the~~

~~Flight Instructor Certificate FI(As)~~		~~Instrument Rating Instructor Certificate (IRI(As))~~		

~~in accordance with the relevant syllabus approved by the Authority.~~

~~Flying hours during the course:~~	
~~Airship/s, simulator/s or flight and navigation procedure trainers used :~~	
~~Name of CFI:~~	
~~Signature:~~	

~~Name of ATO:~~				
~~**7**~~	~~**Flight instructor examiner's certificate**~~			
~~***I have tested the applicant according to Appendix 12***~~				
~~**A – FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT in case of partial pass:**~~				
~~Theoretical oral examination:~~			~~Skill test:~~	
~~***Passed***~~		~~***Failed***~~	~~***Passed***~~	~~***Failed***~~
	~~I recommend further flight/ground training with a FI instructor before re-test~~			
	~~I do not consider further flight/theoretical instruction necessary before re-test~~ ~~*Tick as applicable*~~			
~~**B – FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT:**~~				
	~~Flight Instructor certificate~~			
	~~Instrument Instructor certificate~~ ~~*Tick as applicable*~~			
~~FIE's name (block letters):~~				
~~Signature:~~				
~~Licence number:~~			~~Date:~~	

~~D. Sailplanes~~

~~The AMC No 2 to Appendix 12 (Skill test and proficiency check form for the Light Aircraft Flight Instructor certificate) should be used.~~

~~E. Balloons~~

~~The AMC No 2 to Appendix 12 (Skill test and proficiency check form for the Light Aircraft Flight Instructor certificate) should be used.~~

~~AMC No 2 to Appendix 12~~

~~Skill test and proficiency check form for the Light Aircraft Flight Instructor certificate~~

~~A. Aeroplanes~~

~~**APPLICATION AND REPORT FORM FOR THE LIGHT AIRCRAFT FLIGHT INSTRUCTOR SKILL TEST (LAFI(A))**~~			
~~**1**~~	~~**Applicants personal particulars:**~~		
~~Applicant's last name:~~		~~First names:~~	

~~Date of Birth:~~		~~Tel (Home):~~	~~Tel (Work):~~
~~Address:~~		~~Country:~~	

~~**2**~~	~~**Licence Details**~~			
~~Licence type:~~			~~Number:~~	
~~Class included in the licence:~~	~~1.~~		~~Exp. Date:~~	
	~~2.~~		~~Exp. Date:~~	
~~Ratings included in the licence:~~	~~1.~~			
	~~2.~~			
	~~3.~~			

~~**3**~~	~~**Pre-course flying experience**~~			
~~TOTAL FLYING HOURS~~ ~~(SEP and TMG)~~	~~PIC hours~~	~~SINGLE-ENGINE total and~~ ~~preceding 6 months~~	~~INSTRUMENT FLIGHT INSTRUCTION~~	~~CROSS-COUNTRY hours~~

~~**4**~~	~~**Pre-entry flight test**~~
~~***I recommend ....for the Light Aircraft Flight Instructor Course.***~~	
~~Name of ATO:~~	~~Date of flight test:~~
~~Name of FI conducting the test (Block capitals):~~	
~~Licence number:~~	
~~Signature:~~	

~~**5**~~	~~**Declaration by the applicant**~~				
~~***I have received a course of training in accordance with the syllabus approved by the Authority for the:***~~					
~~Light Aircraft Flight Instructor Certificate LAFI(A)~~					
~~Applicant's name:~~ ~~(Block Letters)~~			~~Signature:~~		
~~**6**~~	~~**Declaration by the chief flight instructor**~~				
~~***I certify that .... has satisfactorily completed an approved course of training for the***~~					
~~Light Aircraft Flight~~					

~~Instructor Certificate LAFI(A)~~					
~~in accordance with the relevant syllabus approved by the Authority.~~					
~~Flying hours during the course:~~					
~~Aeroplane/s, simulator/s or flight and navigation procedure trainers used :~~					
~~Name of CFI:~~					
~~Signature:~~					
~~Name of ATO:~~					

~~7~~	**~~Flight instructor examiner's certificate~~**			
~~I have tested the applicant according to Appendix 12~~				
~~A – LIGHT AIRCRAFT FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT in case of partial pass:~~				
~~Theoretical oral examination:~~			~~Skill test:~~	
~~Passed~~		***~~Failed~~***	***~~Passed~~***	***~~Failed~~***
	~~I recommend further flight/ground training with a LAFI or FI before re-test~~			
	~~I do not consider further flight/theoretical instruction necessary before re-test~~ *~~Tick as applicable~~*			
~~B – FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT:~~				
	~~Light Aircraft Flight Instructor Certificate~~			
~~FIE's name (block letters):~~				
~~Signature:~~				
~~Licence number:~~			~~Date:~~	

~~B. Helicopters~~

~~APPLICATION AND REPORT FORM FOR THE LAFI(H) SKILL TEST~~			
~~1~~	**~~Applicants personal particulars:~~**		
~~Applicant's last name:~~		~~First names:~~	
~~Date of Birth:~~		~~Tel (Home):~~	~~Tel (Work):~~
~~Address:~~		~~Country:~~	
~~2~~	**~~Licence Details~~**		

~~Licence type:~~		~~Number:~~	
		~~Exp. Date:~~	
~~Ratings included in the licence:~~	~~1.~~		
	~~2.~~		
	~~3.~~		

~~3~~	**~~Pre-course flying experience~~**		
~~IR (hours)~~	~~PIC (hours total and on type)~~	~~TOTAL (hours)~~	~~CROSS-COUNTRY (hours)~~

~~4~~	**~~Pre-entry flight test~~**
~~I recommend .... for the Light Aircraft Flight Instructor Course.~~	
~~Name of ATO:~~	~~Date of flight test:~~
~~Name of FI conducting the test (Block capitals):~~	
~~Licence number:~~	
~~Signature:~~	

~~5~~	**~~Declaration by the applicant~~**				
~~I have received a course of training in accordance with the syllabus approved by the Authority for the:~~ *~~(Tick as applicable)~~*					
~~Light Aircraft Flight Instructor Certificate LAFI(H)~~					
~~Applicant's name: (Block Letters)~~		~~Signature:~~			

~~6~~	**~~Declaration by the chief flight instructor~~**				
~~I certify that .... has satisfactorily completed an approved course of training for the~~					
~~Flight Instructor Certificate FI(H)~~					
~~in accordance with the relevant syllabus approved by the Authority.~~					
~~Flying hours during the course:~~					

~~Helicopter/s, flight simulator/s or flight and navigation procedure trainers used :~~
~~Name of CFI:~~
~~Signature:~~
~~Name of ATO:~~

~~**7**~~	~~**Flight instructor examiner's certificate**~~		
~~***I have tested the applicant according to Appendix 12***~~			
~~**A – LIGHT AIRCRAFT FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT in case of partial pass:**~~			
~~Theoretical oral examination:~~		~~Skill test:~~	
~~***Passed***~~	~~***Failed***~~	~~***Passed***~~	~~***Failed***~~

	~~I recommend further flight/ground training with a LAFI / FI instructor before re-test~~
	~~I do not consider further flight/theoretical instruction necessary before re-test~~ ~~*Tick as applicable*~~
~~**B – LIGHT AIRCRAFT FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT:**~~	
	~~Light Aircraft Flight Instructor certificate~~
~~FIE's name (block letters):~~	
~~Signature:~~	
~~Licence number:~~	~~Date:~~

~~C. Sailplanes~~

~~**APPLICATION AND REPORT FORM FOR THE LAFI(S) / FI(S) SKILL TEST**~~

~~**1**~~	~~**Applicants personal particulars:**~~		
~~Applicant's last name:~~		~~First names:~~	
~~Date of Birth:~~		~~Tel (Home):~~	~~Tel (Work):~~
~~Address:~~		~~Country:~~	

~~2~~	~~**Licence Details**~~		
~~Licence type:~~		~~Number:~~	
~~TMG extension:~~			

~~3~~	~~**Pre-course flying experience**~~			
~~TOTAL HOURS~~	~~PIC hours~~	~~SAILPLANE (PIC hours and take offs)~~	~~TOURING MOTOR GLIDER (PIC hours and take offs)~~	

~~4~~	~~**Pre-entry flight test**~~
~~***I recommend ....for the Flight Instructor / Light Aircraft Flight Instructor Course.***~~	
~~Name of ATO:~~	~~Date of flight test:~~
~~Name of LAFI /FI conducting the test (Block capitals):~~	
~~Licence number:~~	
~~Signature:~~	

~~5~~	~~**Declaration by the applicant**~~				
~~***I have received a course of training in accordance with the syllabus approved by the Authority for the:***~~					
~~Light Aircraft Flight Instructor Certificate LAFI(S)~~		~~Flight Instructor Certificate FI(S)~~			
~~Applicant's name: (Block Letters)~~			~~Signature:~~		

~~6~~	~~**Declaration by the chief flight instructor**~~				
~~***I certify that .... has satisfactorily completed an approved course of training for the***~~					
~~Light Aircraft Flight Instructor Certificate LAFI(A)~~		~~Flight Instructor Certificate FI(S)~~			
~~***in accordance with the relevant syllabus approved by the Authority.***~~					
~~Flying hours during the course:~~			~~Take-offs during the course:~~		
~~Sailplanes / powered sailplanes / touring motor gliders used :~~					

~~Name of CFI:~~				
~~Signature:~~				
~~Name of ATO:~~				
~~7~~	**~~Light Aircraft Flight instructor / Flight Instructor examiner's certificate~~**			
~~I have tested the applicant according to Appendix 12~~				
~~A – LIGHT AIRCRAFT FLIGHT INSTRUCTOR / FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT in case of partial pass:~~				
~~Theoretical oral examination:~~		~~Skill test:~~		
~~Passed~~	***~~Failed~~***	***~~Passed~~***	***~~Failed~~***	
	~~I recommend further flight/ground training with a LAFI / FI before re-test~~			
	~~I do not consider further flight/theoretical instruction necessary before re-test~~ *~~Tick as applicable~~*			
~~B – LIGHT AIRCRAFT FLIGHT INSTRUCTOR / FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT:~~				
	~~Light Aircraft Flight Instructor certificate / Flight Instructor certificate~~			
	~~Date:~~			
~~FIE's name (block letters):~~				
~~Signature:~~				
~~Licence number:~~		~~Date:~~		

~~D. Balloons~~

~~APPLICATION AND REPORT FORM FOR THE LAFI(B) / FI(B) SKILL TEST~~			
~~1~~ ~~Applicants personal particulars:~~			
~~Applicant's last name:~~		~~First names:~~	
~~Date of Birth:~~		~~Tel (Home):~~	~~Tel (Work):~~
~~Address:~~		~~Country:~~	
~~2~~ ~~Licence Details~~			
~~Licence type:~~		~~Number :~~	
~~Class extensions:~~	~~1.~~	~~Groups:~~	
	~~2.~~	~~Groups:~~	

	~~3.~~	~~Groups:~~	

~~3~~	**~~Pre-course flying experience~~**

~~TOTAL FLYING HOURS~~	~~PIC hours~~	~~HOT AIR BALLOON~~	~~GAS BALLOON~~	~~HOT AIR AIRSHIP~~
~~small~~				
~~mdium~~				
~~large~~				

~~4~~	**~~Pre-entry flight test~~**

~~I recommend ....for the Light Aircraft Flight Instructor / Flight Instructor course~~

~~Name of ATO:~~	~~Date of flight test:~~
~~Name of LAFI / FI conducting the test (Block capitals):~~	
~~Licence number:~~	
~~Signature:~~	

~~5~~	**~~Declaration by the applicant~~**

~~I have received a course of training in accordance with the syllabus approved by the Authority for the:~~

~~Light Aircraft Flight Instructor Certificate LAFI(B)~~		~~Flight Instructor Certificate FI(B)~~			
~~Applicant's name:~~ ~~(Block Letters)~~			~~Signature:~~		

~~6~~	**~~Declaration by the chief flight instructor~~**

~~I certify that .... has satisfactorily completed an approved course of training for the~~

~~Light Aircraft Flight Instructor Certificate LAFI(A)~~		~~Flight Instructor Certificate FI(B)~~		

~~in accordance with the relevant syllabus approved by the Authority.~~

~~Flying hours during the course:~~	~~Take-offs during the course:~~
~~Balloons, hot-air airships used :~~	
~~Name of CFI:~~	

~~Signature:~~			
~~Name of ATO:~~			
~~7~~	**~~Light Aircraft Flight instructor / Flight Instructor examiner's certificate~~**		
~~I have tested the applicant according to Appendix 12~~			
~~A – LIGHT AIRCRAFT FLIGHT INSTRUCTOR / FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT in case of partial pass:~~			
~~Theoretical oral examination:~~		~~Skill test:~~	
~~Passed~~	***~~Failed~~***	***~~Passed~~***	***~~Failed~~***
	~~I recommend further flight/ground training with a LAFI or FI before re-test~~		
	~~I do not consider further flight/theoretical instruction necessary before re-test~~ *~~Tick as applicable~~*		
~~B – FLIGHT INSTRUCTOR EXAMINER'S ASSESSMENT:~~			
	~~Light Aircraft Flight Instructor Certificate / Flight Instructor Certificate~~		
~~FIE's name (block letters):~~			
~~Signature:~~			
~~Licence number:~~		~~Date:~~	