

MOZAMBIQUE CIVIL AVIATION TECHNICAL STANDARDS



PART 61 MOZ-CATS-FCL 61 FLIGHT CREW LIENSING: PILOTS

MOZAMBIQUE CIVIL AVIATION TECHNICAL STANDARDS: CATS
Each Chapter is re-printed from the amended page onwards.

Parts	Parts Title	Control Date
21	MOZ-CATS-AR Airworthiness Requirements	
43	MOZ-CATS-GMR General Maintenance Rules	
47	MOZ-CATS-ARM Registration and Marking	
61	MOZ-CATS-FCL61 Pilot Licensing	
63	MOZ-CATS-FCL63 Flight Engineer Licensing	
65	MOZ-CATS-GSPL Ground Service Personnel Licensing	
66	MOZ-CATS- AMEL Aircraft Maintenance Engineer Licensing	
67	MOZ-CATS-MR Medical Requirements	
71	MOZ-CATS-AS Designation of Airspace	
91	MOZ-CATS-OPS-91 General Operating and Flight Rules	
103	MOZ-CATS-OPS 103 Microlight Aircraft Operations	
121	MOZ-CATS-OPS-121 Air Transport Operations – Large Aeroplanes	
127	MOZ-CATS-OPS-127 Air Transport Operations – Helicopters	
135	MOZ-CATS-OPS-135 Air Transport Operations – Small Aeroplanes	
138	MOZ-CATS-138-Air Ambulance Operations	
139	MOZ-CATS-AH Licensing and Operation of Aerodromes and Heliports	
141	MOZ-CATS-ATO Aviation Training Organizations	
145	MOZ-CATS-AMO Aircraft Maintenance Organizations	
171	MOZ-CATS-TMS Aeronautical Telecommunication Service	
172	MOZ-CATS-ATS Air Traffic Service Organizations	
175	MOZ-CATS-AIS Aeronautical Information Service Organizations	

**MOZAMBIQUE CIVIL AVIATION TECHNICAL STANDARDS: CATS
RECORD OF REVISIONS**

Revision	Revision of Parts	No of pages	New Date
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

**MOZAMBIQUE CIVIL AVIATION TECHNICAL STANDARDS:
CATS RELATING TO FLIGHT CREW LICENSING - PILOTS**

1. GENERAL

Decree 41 of 2001 empowers the Director General for Civil Aviation to issue technical standards for civil aviation on the matters which are prescribed by regulation.

2. PURPOSE

Document MOZ-CATS-FCL 61 contains the standards, rules, requirements, methods, specifications, characteristics and procedures, which are applicable in respect of flight crew licensing.

Each reference to a technical standard in this document, is a reference to the corresponding regulation in the Mozambique Civil Aviation Regulations, 1999, for example, technical standard 61.01.3 refers to regulation 3 of Subpart 01 of Part 61 of the Regulations.

The abbreviation “MOZ-CAR” is used throughout this document when referring to any regulation.

The abbreviation “TS” refers to any technical standard.

3. SCHEDULES AND NOTES

Guidelines and recommendations in support of any particular technical standard are contained in schedules to, and/or notes inserted throughout the technical standards.

LIST OF TECHNICAL STANDARDS

61.01.7	TYPE RATINGS.....	9
61.01.10	VALIDATION OF LICENSE ISSUED BY APPROPRIATE AUTHORITY.....	10
61.01.11	CREDIT FOR MILITARY SERVICE.....	13
61.01.12	CONVERSION OF PILOT LICENSE ISSUED BY APPROPRIATE AUTHORITY.....	14
61.01.15	LANGUAGE	16
61.01.16	LOGBOOKS.....	18
61.01.18	RETESTING AFTER FAILURE	19
61.01.21	CHANGE OF NAME OR ADDRESS	20
61.01.22	VOLUNTARY SURRENDER OR REPLACEMENT OF LICENSE	21
61.01.23	DUPLICATE PILOT LICENSE AND RATING	22
61.01.25	DESIGNATION OF PILOTS	23
61.01.26	DESIGNATION OF EXAMINERS	24
61.01.30	INTEGRATED TRAINING	27
61.02.2	APPLICATION FOR STUDENT PILOT LICENSE	89
61.02.3	ISSUING OF STUDENT PILOT LICENSE.....	90
61.02.4	TRAINING (SPL).....	91
61.02.5	THEORETICAL KNOWLEDGE EXAMINATION (SPL).....	100
61.02.8	PRIVILEGES AND LIMITATIONS OF STUDENT PILOT LICENSE.....	102
61.03.3	TRAINING (PPL-A)	103
61.03.4	THEORETICAL KNOWLEDGE EXAMINATION (PPL-A)	116
61.03.5	SKILL TEST (PPL-A).....	119
61.03.6	APPLICATION FOR PRIVATE PILOT LICENSE (A)	124
61.03.7	ISSUING OF PRIVATE PILOT LICENSE (A)	125
61.03.11	MAINTENANCE OF COMPETENCY (PPL-A).....	126
61.04.3	TRAINING (PPL-H)	127
61.04.4	THEORETICAL KNOWLEDGE EXAMINATION (PPL-H)	142
61.04.5	SKILL TEST (PPL-H)	145
61.04.6	APPLICATION FOR PRIVATE PILOT LICENSE (H).....	148
61.04.7	ISSUING OF PRIVATE PILOT LICENSE (H)	149
61.04.11	MAINTENANCE OF COMPETENCY (PPL-H).....	150
61.05.3	TRAINING (CPL-A)	151
61.05.4	THEORETICAL KNOWLEDGE EXAMINATION (CPL-A)	155
61.05.5	SKILL TEST (CPL-A)	158
61.05.6	APPLICATION FOR COMMERCIAL PILOT LICENSE (CPL-A)	162
61.05.7	ISSUING OF COMMERCIAL PILOT LICENSE (CPL-A).....	163
61.05.11	MAINTENANCE OF COMPETENCY (CPL-A).....	164
61.06.3	TRAINING (CPL-H).....	165
61.06.4	THEORETICAL KNOWLEDGE EXAMINATION (CPL-H)	167
61.06.5	SKILL TEST (CPL-H)	170
61.06.6	APPLICATION FOR COMMERCIAL PILOT LICENSE (CPL-H)	173
61.06.7	ISSUING OF COMMERCIAL PILOT LICENSE (CPL-H)	174
61.06.11	MAINTENANCE OF COMPETENCY (CPL-H)	175
61.07.2	EXPERIENCE (MULTI-CREW PILOT).....	176
61.07.3	TRAINING (MULTI-CREW PILOT).....	178
61.07.4	THEORETICAL KNOWLEDGE EXAMINATION (MULTI-CREW PILOT).....	182
61.07.5	SKILL TEST (MULTI-CREW PILOT)	185
61.07.6	APPLICATION FOR MULTI-CREW PILOT LICENSE	191

61.07.7	ISSUING OF MULTI-CREW PILOT LICENSE.....	192
61.07.11	MAINTENANCE OF COMPETENCY (MULTI-CREW PILOT)	193
61.08.3	TRAINING (ATP-A)	194
61.08.4	THEORETICAL KNOWLEDGE EXAMINATION (ATP-A)	199
61.08.5	SKILL TEST (ATP-A)	202
61.08.6	APPLICATION FOR AIRLINE TRANSPORT PILOT LICENSE (A).....	208
61.08.7	ISSUING OF AIRLINE TRANSPORT PILOT LICENSE (A)	209
61.08.11	MAINTENANCE OF COMPETENCY (ATP-A).....	210
61.09.3	TRAINING (ATP-H)	211
61.09.4	THEORETICAL KNOWLEDGE EXAMINATION (ATP-H)	213
61.09.5	SKILL TEST (ATP-H)	216
61.09.6	APPLICATION FOR AIRLINE TRANSPORT PILOT LICENSE (H)	220
61.09.7	ISSUING OF AIRLINE TRANSPORT PILOT LICENSE (H)	221
61.09.11	MAINTENANCE OF COMPETENCY (ATP-H)	222
61.10.3	TRAINING (MPL)	223
61.10.4	THEORETICAL KNOWLEDGE EXAMINATION (MPL)	227
61.10.5	SKILL TEST (MPL).....	230
61.10.6	APPLICATION FOR MICROLIGHT PILOT LICENSE.....	234
61.10.7	ISSUING OF MICROLIGHT PILOT LICENSE	235
61.11.3	TRAINING (CMPL).....	236
61.11.4	THEORETICAL KNOWLEDGE EXAMINATION (CMPL).....	238
61.11.5	SKILL TEST (CMPL)	241
61.11.6	APPLICATION FOR COMMERCIAL MICROLIGHT PILOT LICENSE.....	245
61.11.7	ISSUING OF COMMERCIAL MICROLIGHT PILOT LICENSE	246
61.12.3	TRAINING (GLIDER) (RESERVED).....	247
61.12.4	THEORETICAL KNOWLEDGE EXAMINATION (GLIDER) (RESERVED).....	247
61.12.5	SKILL TEST (GLIDER) (RESERVED).....	247
61.12.6	APPLICATION FOR GLIDER PILOT LICENSE (RESERVED)	247
61.12.7	ISSUING OF GLIDER PILOT LICENSE (RESERVED)	247
61.13.3	TRAINING (FREE BALLOON) (RESERVED).....	247
61.13.4	THEORETICAL KNOWLEDGE EXAMINATION (FREE BALLOON) (RESERVED)	247
61.13.5	SKILL TEST (FREE BALLOON) (RESERVED).....	247
61.13.6	APPLICATION FOR FREE BALLOON PILOT LICENSE (RESERVED).....	247
61.13.7	ISSUING OF FREE BALLOON PILOT LICENSE (RESERVED)	247
61.14.3	TRAINING (COMMERCIAL FB) (RESERVED)	248
61.14.4	THEORETICAL KNOWLEDGE EXAMINATION (COMMERCIAL FB) (RESERVED)	248
61.14.5	SKILL TEST (COMMERCIAL FB) (RESERVED).....	248
61.14.6	APPLICATION FOR COMMERCIAL FREE BALLOON PILOT LICENSE (RESERVED).....	248
61.14.7	ISSUING OF COMMERCIAL FREE BALLOON PILOT LICENSE (RESERVED)	248
61.15.3	TRAINING (AIRSHIP) (RESERVED).....	248
61.15.4	THEORETICAL KNOWLEDGE EXAMINATION (AIRSHIP) (RESERVED).....	248
61.15.5	SKILL TEST (AIRSHIP) (RESERVED).....	248
61.15.6	APPLICATION FOR AIRSHIP PILOT LICENSE (RESERVED)	248
61.15.7	ISSUING OF AIRSHIP PILOT LICENSE (RESERVED)	248

61.16.3	TRAINING (COMMERCIAL AIRSHIP) (RESERVED)	249
61.16.4	THEORETICAL KNOWLEDGE EXAMINATION (COMMERCIAL AIRSHIP) (RESERVED)	249
61.16.5	SKILL TEST (COMMERCIAL AIRSHIP) (RESERVED)	249
61.16.6	APPLICATION FOR COMMERCIAL AIRSHIP PILOT LICENSE (RESERVED)	249
61.15.4	THEORETICAL KNOWLEDGE EXAMINATION (AIRSHIP) (RESERVED)	249
61.17.3	TRAINING (GYROPLANE) (RESERVED)	249
61.17.4	THEORETICAL KNOWLEDGE EXAMINATION (GYROPLANE) (RESERVED)	249
61.17.5	SKILL TEST (GYROPLANE) (RESERVED)	249
61.17.6	APPLICATION FOR GYROPLANE PILOT LICENSE (RESERVED)	249
61.17.7	ISSUING OF GYROPLANE PILOT LICENSE (RESERVED)	249
61.18.3	TRAINING (COMMERCIAL GYROPLANE) (RESERVED)	250
61.18.4	THEORETICAL KNOWLEDGE EXAMINATION (COMMERCIAL GYRO) (RESERVED)	250
61.18.5	SKILL TEST (COMMERCIAL GYROPLANE) (RESERVED)	250
61.18.6	APPLICATION FOR COMMERCIAL GYROPLANE PILOT LICENSE (RESERVED)	250
61.18.7	ISSUING OF COMMERCIAL GYROPLANE PILOT LICENSE (RESERVED)	250
61.19.2	TRAINING (TYPE RATING)	251
61.19.3	THEORETICAL KNOWLEDGE EXAMINATION (TYPE RATING)	256
61.19.4	SKILL TEST (TYPE RATING)	263
61.19.5	APPLICATION FOR TYPE RATING	270
61.19.6	ISSUING OF TYPE RATING	271
61.19.9	NOTIFICATION OF ADDITION OF TYPE TO A GROUP TYPE RATING	272
61.19.10	NOTIFICATION OF ADDITION OF TYPE RATING BY NAME	273
61.18.11	RENEWAL (TYPE RATING)	274
61.19.12	REISSUE (TYPE RATING)	276
61.20.3	TRAINING (INSTRUMENT RATING)	277
61.20.4	THEORETICAL KNOWLEDGE EXAMINATION (INSTRUMENT RATING)	280
61.20.5	SKILL TEST (INSTRUMENT RATING)	282
61.20.6	APPLICATION FOR INSTRUMENT RATING	283
61.20.7	ISSUING OF INSTRUMENT RATING	284
61.20.11	RENEWAL (INSTRUMENT RATING)	285
61.20.12	REISSUE (INSTRUMENT RATING)	286
61.21.5	SKILL TEST (GR 1 INSTRUCTOR - A)	287
61.21.6	APPLICATION FOR GRADE 1 INSTRUCTOR RATING –AEROPLANES	290
61.21.7	ISSUING OF GRADE 1 INSTRUCTOR RATING -AEROPLANES	291
61.21.10	RENEWAL (GR 1 INSTRUCTOR - A)	292
61.21.11	REISSUE (GR 1 INSTRUCTOR - A)	293
61.22.3	TRAINING (GR 2 INSTRUCTOR - A)	294
61.22.4	THEORETICAL KNOWLEDGE EXAMINATION (GR 2 INSTRUCTOR - A)	296
61.22.5	SKILL TEST (GR 2 INSTRUCTOR - A)	297
61.22.6	APPLICATION FOR GRADE 2 INSTRUCTOR RATING -AEROPLANES	300
61.22.7	ISSUING OF GRADE 2 INSTRUCTOR RATING –AEROPLANES	301
61.22.9	PRIVILEGES (GR 2 INSTRUCTOR – A)	302
61.22.10	RENEWAL (GR 2 INSTRUCTOR - A)	303
61.22.11	REISSUE (GR 2 INSTRUCTOR - A)	304

61.23.2	TRAINING (GR 3 INSTRUCTOR - A).....	305
61.23.3	THEORETICAL KNOWLEDGE EXAMINATION (GR 3 INSTRUCTOR - A).....	330
61.23.4	SKILL TEST (GR 3 INSTRUCTOR - A).....	332
61.23.5	APPLICATION FOR GRADE 3 INSTRUCTOR RATING -AEROPLANES	335
61.23.6	ISSUING OF GRADE 3 INSTRUCTOR RATING -AEROPLANES	336
61.23.7	PRIVILEGES AND LIMITATIONS (GR 3 INSTRUCTOR – A)	337
61.23.9	RENEWAL (GR 3 INSTRUCTOR - A)	338
61.23.10	REISSUE (GR 3 INSTRUCTOR - A).....	339
61.25.5	SKILL TEST (GR 1 INSTRUCTOR - H).....	340
61.25.6	APPLICATION FOR GRADE 1 INSTRUCTOR RATING - HELICOPTERS	343
61.25.7	ISSUING OF GRADE 1 INSTRUCTOR RATING - HELICOPTERS	344
61.25.10	RENEWAL (GR 1 INSTRUCTOR - H).....	345
61.25.11	REISSUE (GR 1 INSTRUCTOR - H).....	346
61.26.3	TRAINING (GR 2 INSTRUCTOR - H).....	347
61.26.4	THEORETICAL KNOWLEDGE EXAMINATION (GR 2 INSTRUCTOR - H).....	349
61.26.5	SKILL TEST (GR 2 INSTRUCTOR - H).....	350
61.26.6	APPLICATION FOR GRADE 2 INSTRUCTOR RATING - HELICOPTERS	353
61.26.7	ISSUING OF GRADE 2 INSTRUCTOR RATING - HELICOPTERS	354
61.26.9	PRIVILEGES (GR 2 INSTRUCTOR – H).....	355
61.26.10	Renewal (GR 2 INSTRUCTOR – H).....	356
61.26.11	REISSUE (GR 2 INSTRUCTOR - H).....	357
61.27.2	TRAINING (GR 3 INSTRUCTOR - H).....	358
61.27.3	THEORETICAL KNOWLEDGE EXAMINATION (GR 3 INSTRUCTOR-H).....	364
61.27.4	SKILL TEST (GR 3 INSTRUCTOR - H).....	366
61.27.5	APPLICATION FOR GRADE 3 INSTRUCTOR RATING – HELICOPTERS	369
61.27.6	ISSUING OF GRADE 3 INSTRUCTOR RATING – HELICOPTERS.....	370
61.27.9	RENEWAL (GR 3 INSTRUCTOR - H).....	371
61.27.10	REISSUE (GR 3 INSTRUCTOR - H).....	372
61.29.2	TRAINING (MPL INSTRUCTOR)	373
61.29.3	THEORETICAL KNOWLEDGE EXAMINATION (MPL INSTRUCTOR)	378
61.29.4	SKILL TEST (MPL INSTRUCTOR)	380
61.29.5	APPLICATION FOR MICROLIGHT INSTRUCTOR RATING	383
61.29.6	ISSUING OF MICROLIGHT INSTRUCTOR RATING.....	384
61.29.9	RENEWAL (MPL INSTRUCTOR).....	385
61.29.10	REISSUE (MPL INSTRUCTOR).....	386
61.30.3	APPLICATION FOR TUG PILOT RATING	387
61.30.4	ISSUING OF TUG PILOT RATING	388
61.31.3	TRAINING (EXTERNAL LOAD)	389
61.31.4	APPLICATION FOR EXTERNAL LOAD RATING.....	393
61.31.5	ISSUING OF EXTERNAL LOAD RATING.....	394
61.32.3	SKILL TEST (AGRICULTURAL PILOT RATING)	395
61.32.4	APPLICATION FOR AGRICULTURAL PILOT RATING	397
61.32.5	ISSUING OF AGRICULTURAL PILOT RATING.....	398
	ANNEX A: ICAO LANGUAGE PROFICIENCY RATING SCALE	399
	ANNEX B: LOGBOOK.....	401

61.01.7 TYPE RATINGS

1. Conditions, requirements, rules, procedures or standards

- (1) The establishment of separate type ratings for aircraft is assessed on the basis of the following criteria:
 - (a) The aircraft has a separate airworthiness type certificate;
 - (b) the aircraft has handling characteristics that require additional flying or simulator training; or
 - (c) the aircraft has a different certificated minimum flight crew complement.
- (2) On completion of the required type rating training prescribed in Subpart 19, the theoretical knowledge examination as prescribed in Subpart 19 must be completed.
- (3) The Grade I/II instructor or designated examiner must indicate and recommend that the applicant has successfully completed the training and theoretical knowledge examination and is ready for his/her type rating skill test. The skill test may not be conducted by the same person/s who has been involved with the training and theoretical knowledge examination.
- (4) The test officer (Grade I/II instructor or designated examiner) must recommend that the Director General issue the type rating only after the applicant has successfully completed the training and theoretical knowledge examination and passed the type rating skill test.
- (5) The Grade I/II instructor or designated examiner may issue a temporary certificate valid for 30 days only.
- (6) The Grade I/II instructor or designated examiner must complete the type rating application form and the type rating skill test form and must forward it to the Director General for the addition of the type rating to the license holder's license within 7 days of completion of the skill test.

61.01.10 VALIDATION OF LICENSE ISSUED BY APPROPRIATE AUTHORITY

1. Form of application

The form referred to in CAR 61.01.10(1), in which application must be made for the validation of a foreign pilot license and rating, is form MZ 61-04 which is available from the Director General.

2. Requirements and conditions**2.1 General**

- (1) The Director General may not provide for any additions to a license or rating, other than the types of aircraft for which the applicant is rated in terms of his or her original license and rating.
- (2) The holder of a validation may only fly the types of aircraft for which he or she is rated in terms of his or her original license and rating.
- (3) The holder of a private pilot license or commercial pilot license which has been validated by the Director General, may obtain an instrument rating if such holder –
 - (a) obtains a private pilot license issued in terms of Part 61; and
 - (b) complies with the requirements prescribed for an instrument rating in Part 61.

2.2 Validation of any pilot license and rating, to be exercised for PRIVATE purposes

- (1) The Director General may validate any pilot license and rating for private use, if the applicant complies with the following requirements and conditions:
 - (a) The applicant must pass a theoretical knowledge examination in Mozambique air law;
 - (b) The applicant must undergo a skill test, including a cross-country flight, with a Grade I or II flight instructor or a designated examiner; and
 - (c) the applicant must comply with the requirements pertaining to radiotelephony certificates.
- (2) The Director General may validate an INSTRUMENT RATING if the applicant complies with the following requirements and conditions:
 - (a) The applicant must pass an examination in Mozambique air law and procedures; and
 - (b) the applicant must undergo an instrument skill test with a designated examiner or an IACM inspector.

Note: If an applicant applies for the validation of both a pilot license and an instrument rating, the applicant does not have to comply with the requirements and conditions referred to in subparagraph (1)(a) and (b).

2.3 Validation and renewal of a validation to be exercised for COMMERCIAL purposes

- (1) The Director General may validate any commercial pilot license and airline transport pilot license with ratings for commercial use, if the applicant complies with the following requirements and conditions: The applicant must -
 - (a) be in possession of a valid commercial pilot license or airline transport pilot license and, if applicable, a valid instrument rating;
 - (b) have flown a minimum of 500 hours as a commercial pilot or airline transport pilot in the country of issue of his or her license or in an environment at least equal to or similar than that of Mozambique;
 - (c) pass a theoretical knowledge examination in Mozambique air law;
 - (d) in the case of a validation of an INSTRUMENT rating, pass an examination in Mozambique air law and procedures;
 - (e) undergo a cross-country skill test, including an instrument rating skill test when applicable, with a designated examiner or an IACM inspector; and
 - (f) comply with the requirements applicable to radiotelephony certificates.
- (2) In the case of a cross-country flight referred to in subparagraph (1)(e), the inspector of flying may request the applicant to fly without the use of navigational aids.
- (3) The Director General may renew a validation of a commercial pilot license, airline transport pilot license and rating for commercial use only ONCE, if -
 - (a) the applicant is, at the time of renewal, employed by a Mozambique employer and is in possession of a letter of employment from the employer;
 - (b) the original license is valid and all requirements regarding proficiency and other requirements prescribed by the country of issue, are complied with; and
 - (c) the requirements prescribed in Part 61 for the renewal of a rating, are complied with.

Note: If an applicant needs to continue flying within Mozambique for commercial purposes he/she needs to make application for the conversion of his/her foreign pilot license during the last 6 months of validity of the validation.

3. Form of validation

The form referred to in CAR 61.01.10(3)(c), on which a foreign license and rating is validated, is determined by the Director General.

4. Renewal of validation

The Director General may renew the validation if the holder of such validation has, for the duration of the validation, exercised the privileges of the pilot license to which the validation pertains, in accordance with the provisions of the Act, the Regulations and this Document.

5. Compliance

The appropriate standards, rules, requirements, methods, specifications, characteristics and procedures contained in the Act, the Regulations and this Document, must be complied with at all times.

61.01.11 CREDIT FOR MILITARY SERVICE

1. Form of application

The form referred to in CAR 61.01.11 (4)(a), in which application must be made for the issuing of a pilot license and rating is the application form for the type of license applied for.

2. Skill test report

The skill test report referred to in CAR 61.01.11(4)(e) that must accompany the application, is the skill test report required for the type of license applied for.

61.01.12 CONVERSION OF PILOT LICENSE ISSUED BY APPROPRIATE AUTHORITY

1. Form of application

The form referred to in CAR 61.01.12(2)(a), in which application must be made for the conversion of a foreign pilot license and rating, is forms MZ 61-05 and MZ 61-06, which is available from the Director General.

2. Conditions, rules, requirements, procedures or standards**2.1 Conditions & requirements**

- (1) The Director General may convert a foreign license into a Mozambique license by issuing a Mozambique license on the basis of the foreign license.
- (2) The Director General shall only consider converting a foreign license after the equivalence in standards between the specific country and Mozambique has been determined.
- (3) Where the foreign country's standards are not to the equivalent of the standards applied in Mozambique, the applicant shall be required to undergo additional training, examinations and tests in order to satisfy the Mozambique requirements before a license will be issued.
- (4) Where the foreign country's standards are equivalent or better than those applied in Mozambique, the applicant shall be required to complete a Mozambique Air Law and Procedures examination and to pass a practical skill test on the level of the license applied for.
- (5) Once a Mozambique License has been issued on the basis of the foreign license, the holder holds a valid Mozambique license and is required to meet all legal requirements and standards applicable to the currency of the license and the validity of the ratings.

2.2 Procedures

- (1) An applicant is required to submit a Pre-approval application for the conversion of the foreign license (MZ 61-05).
- (2) The Director General shall perform an equivalence assessment of the standards of the country of issue of the applicant's license and inform the applicant of the training, examinations and tests to be performed.
- (3) The applicant shall undergo any required training and pass the examinations and the tests and apply for the conversion on form MZ61-06, accompanied by the proof of meeting the requirements.
- (4) The Director General shall assess the application and issue the conversion when all requirements have been met.

3. Form of conversion

The form referred to in CAR 61.01.12(4), on which a foreign license and rating is converted, is determined by the Director General.

61.01.15 LANGUAGE

1. Proficiency testing requirements**1.1 General requirements**

- (1) Initial applicants for licenses shall be tested for language proficiency and rated in accordance with the ICAO rating scale which is attached as Annex A.
- (2) The completion of an English Language training course would be required before the test for language proficiency can be completed. A course certificate would be required to be admitted to the language proficiency test.
- (3) The initial language test would determine the level of English proficiency and shall be reflected on the Proficiency certificate.
- (4) Language proficiency retesting would have to be completed in the following intervals:
 - (a) Level 4 proficiency – every 3 years
 - (b) Level 5 proficiency – every 6 years
 - (c) Level 6 proficiency – no re-testing required
- (5) The license holder shall carry his Language Proficiency Certificate with his license and shall submit it to any authorized officer or inspector on request.

1.2 Proficiency Training and Testing

- (1) The Language Proficiency training course shall be completed by all initial applicants for licenses.
- (2) The Language Proficiency training course shall only be completed with an approved training organization which is approved by the Director General or with a foreign training organization which is accepted by the Director General.
- (3) The Language Proficiency test shall be conducted by an organization or establishment which is approved by the Director General for this purpose.
- (4) If the license holder fails to achieve the required level of proficiency, his license would be restricted until such time that the required level of proficiency is attained.
- (5) The Language Proficiency certificate must be submitted to the Director General together with the application for the issuance of a pilot license.

1.3 Re-testing

- (1) Language proficiency re-testing shall only be conducted by an organization or establishment which is approved by the Director General.
- (2) If the proficiency re-test indicates a lower than acceptable (level 4) level of proficiency, the license holder shall be required to attend a language proficiency training course again before being re-tested.
- (3) If the license holder fails to achieve the required level of proficiency, his license would be restricted until such time that the required level of proficiency is attained again.

61.01.16 LOGBOOKS

1. Form of logbooks

Logbooks must be maintained in the form contained in Annex B.

2. Information to be contained in logbooks

The following information must be recorded in logbooks:

- (1) Full name and address of owner;
- (2) summary of previous flying experience, if any; and
- (3) particulars of flights -
 - (a) date;
 - (b) type and registration of the aircraft in which the flight occurs;
 - (c) operating capacity of holder;
 - (d) flight time; and
 - (e) nature of flight.

3. Manner in which logbooks are to be maintained

In order to facilitate the issuing of licenses and ratings, a pilot must -

- (1) clearly indicate instrument, night and instructional flight times and time in simulators; and
- (2) summarise his or her logbook in the form contained in Annex B.

61.01.18 RETESTING AFTER FAILURE

1. Retesting after failure

- (1) The pass mark for any written theoretical knowledge examination referred to in Part 61 is 70%.
- (2) A candidate who fails with a mark between 66% and 69%, may apply in writing for a re-mark within 30 days from the date of receiving the examination results, on payment of the appropriate fee.
- (3) A candidate who fails, may apply in writing for retesting after 30 days from the date of receiving the examination results, on payment of the appropriate fee.
- (4) A candidate may apply four times for retesting, after which the candidate must undergo the appropriate training at an approved aviation training organisation. Any further application for retesting must be accompanied by a training certificate issued by the aviation training organisation concerned.

61.01.21 CHANGE OF NAME OR ADDRESS

1. Form of application

The form referred to in CAR 61.01.21(2)(a), in which application must be made for the issuing of a new pilot license and rating, is form MZ Gen-01, which is available from the Director General.

61.01.22 VOLUNTARY SURRENDER OR REPLACEMENT OF LICENSE

1. Form of notification

The Director General must be notified of the voluntary surrender or replacement of a pilot license and rating by means of a letter of notification accompanied by the license which is surrendered or being replaced.

61.01.23 DUPLICATE PILOT LICENSE AND RATING

1. Form of application

The form referred to in CAR 61.01.23(2)(a), in which application must be made for the issuing of a duplicate pilot license and rating, is form MZ Gen-03, which is available from the Director General.

61.01.25 DESIGNATION OF PILOTS

1. Conditions, requirements, rules, procedures or standards**1.1 Requirements & Conditions**

- (1) The Director General may designate any pilot to perform functions on behalf of the Director General, when the pilot possesses specific skill and/or competence that is required for the assessment of any application in terms of Part 61.
- (2) The scope of the designation depends upon the qualifications and experience of the pilot and on the specific skill required by the Director General.
- (3) The applicant must possess the qualifications and experience appropriate to the particular function for which designation is intended.
- (4) Designation will be limited to a specific function and will be limited to a specific time period.

1.2 Procedures

- (1) The Director General will identify and appoint a pilot after consultation with the pilot to be designated.
- (2) The Director General will issue a document indicating the scope and time of the designation.
- (3) The Director General may withdraw a designation if -
 - (a) it becomes evident that the designated pilot does not comply with the provisions of the designation; or
 - (b) the withdrawal is necessary in the interests of aviation safety.
- (4) The designated pilot must, upon the withdrawal of the designation by the Director General, forthwith surrender the designation document to the Director General.

2. Submission of reports

- (1) A designated pilot must submit a report to the Director General on all skill tests and proficiency checks conducted. These reports must be submitted regardless of the results of the skill tests/proficiency checks.
- (2) In the event of a failure, the report must indicate notes on the de-briefing done and the candidate must initial all such notes.
- (3) Any report not duly completed by the designated pilot may be rejected by the Director General, and in this case the test would be void and would have to be re-submitted.

61.01.26 DESIGNATION OF EXAMINERS

1. Conditions, requirements, rules, procedures or standards**1.1 Requirements & Conditions**

- (1) The Director General may designate the following flight instructors as examiners to perform the functions referred to in CAR 61.01.26:
 - (a) Category A flight instructors (Aeroplane Instructors):

Grade I aeroplane flight instructor - for the issuing of a commercial pilot license (aeroplane), an airline transport pilot license (aeroplane) and the issuing, renewal or reissuing of associated ratings and certificates.
 - (b) Category B flight instructors (Helicopter Instructors)

Grade I helicopter flight instructor – for the issuing of a commercial pilot license (helicopter), an airline transport pilot license (helicopter) and the issuing, renewal or reissuing of associated ratings and certificates.
 - (c) Category C flight instructors (Microlight Instructors)

Microlight aeroplane flight instructor - for the issuing of a microlight aeroplane pilot license and a commercial microlight aeroplane pilot license and the issuing, renewal or reissuing of associated ratings.
- (2) The scope of the designation depends upon the qualifications and experience of the designated examiner.
- (3) To qualify for a designation, the applicant must possess the qualifications listed in the MOZ-CAR and experience appropriate to the particular function for which designation is sought:
 - (a) Current and thorough knowledge of the MOZ-CAR and relevant Information Circulars, Technical Standards Documents, etc
 - (b) Current technical knowledge and experience commensurate with that required for the particular function.
 - (c) Unquestionable integrity, cooperative attitude, and ability to exercise sound judgment;
 - (d) The ability to maintain the highest degree of objectivity, while performing authorized functions on behalf of the Director General;
 - (e) At least 200 hours of practical experience in the field covered by the designation.

1.2. Procedures

- (1) Any person who desires to be designated as an examiner, must apply in writing to the Director General.
- (2) An application for the designation as an examiner must be accompanied by proof that the applicant complies with the conditions, requirements and standards prescribed in this technical standard.
- (3) The Director General may, after due consideration of the application, designate the applicant as an examiner.
- (4) The Director General may designate the applicant as an examiner for the period determined by the Director General, which period may not exceed one year, calculated from the date of designation.
- (5) The Director General may withdraw a designation if -
 - (a) it becomes evident that the designated examiner does not comply with the provisions of this technical standard; or
 - (b) the withdrawal is necessary in the interests of aviation safety.
- (6) The designated examiner must, upon the withdrawal of the designation by the Director General, forthwith surrender the document referred to in CAR 61.01.26(3) to the Director General.

2. Submission of reports

- (1) An examiner must submit a report to the Director General quarterly, on all skill tests and proficiency checks conducted by the examiner. These reports must be submitted regardless of the results of the skill tests/proficiency checks or even if no skill tests/proficiency checks were conducted by the examiner.
- (2) Skill Test Reports where the tests or checks resulted in a failure must be forwarded by the examiner to the Director General for record keeping within 7 days of the date of the test.
- (3) In the event of a failure, the report must indicate notes on the de-briefing done and the candidate must initial all such notes.
- (4) Any report not duly completed by an examiner may be rejected by the Director General and in this case the test would be void and would have to be re-submitted.

3. Responsibility

- (1) It is the responsibility of the examiner to ensure that the candidate has passed the relevant theoretical knowledge examinations with the IACM or with the ATO or operator before commencing the skill test, where applicable.
- (2) It is also the responsibility of the examiner to ensure that the candidate is in possession of a valid license and that his or her flying hours comply with the requirements for that particular license as is required by Part 61.

4. Monitoring of the system

- (1) The Director General may, at any time, require an examiner to subject himself or herself to a ground or skill test/monitor, should it become evident that such examiner is not maintaining the required standard of testing.

61.01.30 INTEGRATED TRAINING

1. Conditions, requirements, rules, procedures or standards

- (1) Any integrated training course must provide competence to the level of the license for which the training is provided.
- (2) Any integrated training may only be provided by an Aviation Training Organization or by a foreign aviation training organization which is accepted by the Director General.

2. Integrated Training Course for COMMERCIAL PILOT LICENSE (AEROPLANE or HELICOPTER) WITHOUT INSTRUMENT RATING**2.1 Aim of training course**

The aim of the training course is to train a candidate to the level of proficiency necessary for the issuing of a commercial pilot license (aeroplane or helicopter), and, when applied for to provide specialised training for aerial work, such as aerial application which the candidate wishes to pursue. The course excludes the training requirements for an instrument rating and a flight instructor rating.

2.2 Duration, contents and requirements of training course

- (1) The course is expected to last between 9 and 24 months. The course is continuous. The applicant may be admitted as an ab initio entrant or as the holder of a private pilot license (aeroplane or helicopter). In the case of the holder of a private pilot license (aeroplane or helicopter), 50% of the hours flown by the holder prior to the course, may be credited towards the course flight time requirement, up to a maximum of 40 hours, of which a maximum of 20 hours may be dual instruction.
- (2) If the candidate fails to complete the course, he or she may apply to the Director General to complete the theoretical knowledge examination and skill test prescribed for a private pilot license (aeroplane and helicopter).
- (3) Should the candidate wish to transfer from one aviation training organisation (ATO) to another, he or she may apply to the Director General for an assessment of the further hours of training that may be required at the other ATO.
- (4) Prior to being admitted to the training course, the ATO must ensure that the candidate has sufficient knowledge of mathematics and physics to facilitate an understanding of the theoretical knowledge instruction element of the course.
- (5) The course comprises -
 - (a) a theoretical knowledge course to commercial pilot license (aeroplane and helicopter) knowledge level; and

- (b) visual and instrument flying training.

2.3 Theoretical knowledge course

The theoretical knowledge course comprises at least 400 hours of instruction, or 350 hours of instruction, in the case of a candidate who holds a private pilot license (aeroplane or helicopter). The course includes formal classroom work, computer-based training, slide/tape presentation, interactive video and learning carrels, where appropriate.

The required hours of instruction should preferably be divided as follows:

Subject	Hours Ab initio Candidate	Hours Holder of PPL
Air law and ATC procedures	50	40
Aircraft general knowledge	60	50
Flight performance and planning	60	55
Human performance and limitations	10	10
Meteorology	60	50
Navigation	100	90
Operational procedures	10	10
Principles of flight	30	25
Communications	20	20

2.4 Visual and instrument flying training

Phase 1									
Exercise	Sim	Dual	Solo	Acc Total	SPIC	VFR	IFR	S/E	M/E
Pre-solo		11	.5	11.5	.5	11.5		11.5	
Consolidation		3	2.5	17	2.5	5.5		5.5	
Advanced Exercises		3	5	25	5	8		8	
Intro to IF		2		27			2	2	
Navigation		6	6	39	6	12		12	
Consolidation		1	2	42	2	3		3	
Flight test/Check (PPL)			3'	45	3	3		3	
Totals (45)		26	19		19	43	2	45	

Phase 2									
Exercise	Sim	Dual	Solo	Acc Total	SPIC	VFR	IFR	S/E	M/E
Conversion Hi-performance SE			1	6	1	6		6	
Consolidation			24	30	24	30		24	
Navigation			24	54	24	20		24	
Instrument flying	10	10		74			10	10	
Night flying under supervision (plus test)		4	10	88	10	15		14	
Totals (88)	10	19	59		59	41	10	78	

Phase 3									
Exercise	Sim	Dual	Solo	Acc Total	SPIC	VFR	IFR	S/E	M/E
Specialist Work		30						30	
CPL flight test			2'		2			2	
Grand totals (165)	10	75	80		80	99	95	32	

2.4.1 Phase One

This phase encompasses the training required for a Private Pilot License. A PPL is not necessarily required in an integrated Course but provision has been made for this license. The two hour instrument appreciation is provided with a view to providing the student with the necessary skill to conduct a 180° turn in the event of encountering poor weather during the navigation exercises. If the flight test is successful this time may be counted towards the total SPIC / solo time of 80 hours.

2.4.2 Phase Two

This phase is aimed at making the student proficient at general flying in complex single-engine aircraft. This is followed by VFR navigation exercises one of which must be solo and over a triangular route of at least 300 nm with at least two full stop landings at two different aerodromes. Once this is complete the student learns to fly on instruments prior to the night flight training. The night flight training is followed by IFR navigation exercises some of which may count as SPIC time provided the flight instructor does not have to influence or control any part of the flight. Debriefing following the flight does not constitute influencing the flight.

2.4.3 Phase Three

Phase three is entirely advanced flight training towards the specialist work that the student intends pursuing e.g. aerial application. Some of hours towards the specialist training may be reallocated to repetition in phase two as required. This phase culminates in the CPL flight test.

All flight times and simulator times are to be considered as being minimum times. The object of this and the other courses is to produce proficient crew members.

3. Integrated Training Course for COMMERCIAL PILOT LICENSE (Aeroplane or Helicopter) WITH INSTRUMENT RATING

3.1. Aim of training course

The aim of the training course is to train a candidate to the level of proficiency necessary for the issuing of a commercial pilot license (aeroplane or helicopter) with an instrument rating and to operate single-pilot, single-engine and single-pilot, multi-engine aeroplanes and helicopters in commercial air transportation.

3.2 Duration, contents and requirements of training course

- (1) The course is expected to last between 9 and 24 months. The course is continuous. The applicant may be admitted as an ab-initio entrant or as the holder of a private pilot license (aeroplane or helicopter). In the case of the holder of a private pilot license (aeroplane or helicopter), 50% of the hours flown by the holder prior to the course, may be credited towards the course, flight time requirement, up to a maximum of 40 hours, of which a maximum of 20 hours may be dual instruction.
- (2) If the candidate fails to complete the course, he or she may apply to the Director General to complete the theoretical knowledge examination and skill test prescribed for a private pilot license (aeroplane or helicopter).
- (3) Should the candidate wish to transfer from one aviation training organisation (ATO) to another, he or she may apply to the Director General for an assessment of the further hours of training that may be required at the other ATO.
- (4) Prior to being admitted to the training course, the ATO must ensure that the candidate has sufficient knowledge of mathematics and physics to facilitate an understanding of the theoretical knowledge instruction element of the course.
- (5) The course comprises -
 - (a) a theoretical knowledge course to commercial pilot license (aeroplane or helicopter) , knowledge level; and
 - (b) visual and instrument flying training.

3.3 Theoretical knowledge course

The theoretical knowledge course comprises at least 650 hours of instruction, in the form of formal classroom work, computer-based training, slide/tape presentation, interactive video and learning carrels, where appropriate.

The 650 hours of instruction should preferably be divided as follows:

Subject	Hours instruction
Air Law	60
ATC procedures	80
Aircraft general knowledge	90
Flight performance and Planning	10
Human performance and limitations	80
Meteorology	280
Navigation	20
Operational procedures	30
Principles of flight	60
Communications	30
	70
	50

Successfully passing the theoretical knowledge examinations means that the candidate meets the theoretical knowledge requirements for commercial pilot license (aeroplane or helicopter).

3.4. Visual and instrument flying training

Phase 1									
Exercise	Sim	Dual	Solo	Acc Total	SPIC	VFR	IFR	S/E	WE
Pre-solo		11	.5	11.5	.5	11.5		11.5	
Consolidation		3	2.5	17	2.5	5.5		5.5	
Advanced exercises		3		25	5	8		8	
Intro to IF		2		27			2	2	
Navigation		6	6	39	6	12		12	
Consolidation		1	2	42	2	3		3	
Flight test/Check (PPL)		3		45	3	3			
Totals		29	16		23.5	43	2	45	

Phase 2									
Exercise	Sim	Dual	Solo	Acc Total	SPIC	VFR	IFR	S/E	WE
Conversion HI Pert SE		5	1	6	1	6		6	
Consolidation			6	12	6	6			
Navigation			20	32	20	20		20	
Instrument flying	20	10		62			30	10	
Night flying (plus test)		5*	10	77	11	15		15	
Navigation IFR		35*		112	25		25	35	
Totals	20	55	37		63	41	65	86	

Phase 3									
Exercise	Sim	Dual	Solo	Acc Total	SPIC	VFR	IFR	S/E	WE
Conversion to WE a/c		10	3	13	3	13			13
Instrument flying	10	6		29			16		6
Airways flying		10*		39	10		10		10
CPL flight test		2`		41	2	2			2
I/R flight test		2'		43	2		2		2
Totals	10	30	3		17	15	28		33
Grand totals	30	114	56		100	99	95		

3.4.1 Phase One

This phase encompasses the training required for a Private Pilot License. A PPL is not necessarily required in an integrated course but provision has been made for this license. The two hour instrument appreciation is provided with a view to providing the student with the necessary skill to conduct a 180° turn in the event of encountering poor weather during the navigation exercises. If the flight test is successful this time may be counted towards the total SPIC / solo time of 100 hours.

3.4.2 Phase Two

This phase is aimed at making the student proficient at general flying in complex single-engine aircraft. This is followed by VFR navigation exercises one of which must be solo and over a triangular route of at least 300 nm with at least two full stop landings at two different aerodromes. Once this is complete the student learns to fly on instruments prior to the night flight training. The night flight training is followed by IFR navigation exercises some of which may count as SPIC time provided the flight instructor does not have to influence or control any part of the flight. Debriefing following the flight does not constitute influencing the flight.

3.4.3 Phase Three

Phase three is entirely advanced flight training on complex single-engine or multi-engine aircraft. This phase culminates in the CPL and instrument rating flight tests. Should the student pilot elect not to do the multi-engine training, the 10 hours dual flight time and 10 hours of simulator time in phase 3 may be subtracted from the total flight time. The Single-Engine Integrated CPL / instrument rating course is therefore 151/101 hours and for the Multi-engine CPL / instrument rating course, 171/121 hours, 80 hours dual instruction is required of which 10 hours can be in a simulator and 70 hours solo of which 23 hours can be as student pilot-in-command. This syllabus meets all of these requirements.

All flight times and simulator times are to be considered as being minimum times. The object of this and the other courses is to produce proficient crew members.

4. Generic Theoretical Knowledge Training Syllabus

The theoretical knowledge course must cover the subjects as detailed in the syllabus. The knowledge acquired must be sufficient for the candidate to pass the following theoretical knowledge examinations:

1. Aviation Meteorology
2. Flight Planning and Performance
3. Radio Aids and Communication
4. General Navigation
5. Navigation (Plotting)
6. Operational Procedures
7. Instruments and Electronics
8. Aircraft Technical & Principles of Flight
9. Air Law
10. Human Performance

1. METEOROLOGY

PPL = Private pilot license; CPL = Commercial pilot license; ATPL = Airline Transport pilot license; IR = Instrument rating;

A = Aeroplane; H = Helicopter; M = Microlight; N/a = not applicable

1.1	THE ATMOSPHERE	PPL	CPL	IR	ATPL
	Composition of the Atmosphere	A/H/M	A/H/M	N/a	A/H
	Water Vapour	N/a	A/H/M	N/a	A/H
	Condensation nuclei	N/a	A/H/M	N/a	A/H
	Ozone	N/a	A/H/M	N/a	A/H
	Structure of the Atmosphere	A/H/M	A/H/M	N/a	A/H
	The Troposphere	N/a	A/H/M	N/a	A/H
	The Stratosphere	N/a	A/H/M	N/a	A/H
	The Mesosphere	N/a	A/H/M	N/a	A/H
	International Standard Atmosphere	N/a	A/H/M	N/a	A/H
	Jet Standard Atmosphere	N/a	A/H/M	N/a	A/H

1.2	PRESSURE	PPL	CPL	IR	ATPL
	Definition of Atmospheric Pressure	A/H/M	A/H/M	N/a	A/H
	Imperial System	N/a	A/H/M	N/a	A/H
	Metric System	A/H/M	A/H/M	N/a	A/H
	Mercury Barometer	A/H/M	A/H/M	N/a	A/H
	Aneroid Barometer	A/H/M	A/H/M	N/a	A/H
	Barograph	A/H/M	A/H/M	N/a	A/H
	Digital Display Barometer	A/H/M	A/H/M	N/a	A/H
	Pressure Tendency	A/M	A/H/M	N/a	A/H
	Density Change	A/H/M	A/H/M	N/a	A/H
	Mean Sea Level Pressure Change	A/M	A/H/M	N/a	A/H
	Thermal Depressions	N/a	A/H/M	N/a	N/a
	Orographic Depressions	N/a	A/H/M	N/a	N/a
	Secondary Depressions	N/a	A/H/M	N/a	A/H
	Trough of Low Pressure	N/a	A/H/M	N/a	A/H
	Coastal Low	N/a	A/H/M	N/a	N/a

1.2	PRESSURE	PPL	CPL	IR	ATPL
	Tropical cyclones	N/a	A/H/M	N/a	N/a
	Anti-Cyclone or High Pressure	N/a	A/H/M	N/a	A/H
	Cold anti-cyclones	N/a	A/H/M	N/a	N/a
	Warm anti-cyclones	N/a	A/H/M	N/a	N/a
	Ridge or High Pressure	N/a	A/H/M	N/a	A/H
	Cold Area	A/M	A/H/M	N/a	A/H
	Pressure Gradient	A/H/M	A/H/M	N/a	A/H
	Diurnal Pressure Variation	H	A/H/M	N/a	A / H
	Altimetry	A/H/M	A/H/M	N/a	A / H
	QFE	H	A/H/M	N/a	A / H
	QNH	H	A/H/M	N/a	A / H
	QNE	N/a	A/H/M	N/a	A / H
	Changes of pressure, density and temperature with altitude	A/H/M	A/H/M	N/a	A/H
	Altimetry terminology	A/H/M	A/H/M	N/a	A/H
	Stability and instability	A/H/M	A/H/M	N/a	A/H
	Application of Altimetry	N/a	H	N/a	A/H

1.3	TEMPERATURE	PPL	CPL	IR	ATPL
	Temperature Scales	N/a	H	N/a	A/H
	Solar and terrestrial energy radiation, temperature	A/H/M	A/H/M	N/a	A/H
	Temperature lapse rate	A/H/M	A/H/M	N/a	A/H
	Thermometers	N/a	A/H/M	N/a	A / H
	Radiation	A/H/M	A/H/M	N/a	A / H
	Conduction	N/a	H	N/a	A / H
	Convection	N/a	H	N/a	A / H
	Advection	A/H/M	A/H/M	N/a	A / H
	Land and Sea Heating / Cooling	N/a	H	N/a	A / H
	Diurnal Variation	A/H/M	A/H/M	N/a	A / H
	Lapse Rates	A/M	A/H/M	N/a	A / H
	Inversion	N/a	A/H/M	N/a	A / H
	Environmental Lapse Rate	N/a	A/H/M	N/a	A / H

1.4	DENSITY	PPL	CPL	IR	ATPL
	Compressibility of Gases	N/a	A/H/M	N/a	A / H
	Pressure	A	A/H/M	N/a	A / H
	Effect of Pressure	A/H/M	A/H/M	N/a	A / H
	Effect of Temperature	A/H/M	A/H/M	N/a	A / H
	Combined effect of Pressure and Temperature	A/H/M	A/H/M	N/a	A / H
	Effect of Humidity	N/a	A/H/M	N/a	A / H
	Density Altitude	N/a	A/H/M	N/a	A / H

1.5	HUMIDITY	PPL	CPL	IR	ATPL
	Water Vapour	A/H/M	A/H/M	N/a	A / H
	Saturation	N/a	A/H/M	N/a	A / H
	Dew Point	A/H/M	A/H/M	N/a	A / H
	Condensation	A/H/M	A/H/M	N/a	A / H
	Sublimation	N/a	A/H/M	N/a	A / H
	Evaporation	A/H/M	A/H/M	N/a	A / H
	Relative Humidity	N/a	A/H/M	N/a	A / H
	Vapour Pressure	A/H/M	A/H/M	N/a	A / H

1.5	HUMIDITY	PPL	CPL	IR	ATPL
	Change of State	A/H/M	A/H/M	N/a	A / H
	Psychrometer	N/a	A/H/M	N/a	A / H

1.6	ADIABATIC PROCESS, LAPSE RATE & STABILITY	PPL	CPL	IR	ATPL
	Adiabatic Process	A/H/M	A/H/M	N/a	A / H
	Dry Adiabatic Lapse Rate (DALR)	N/a	A/H/M	N/a	A / H
	Saturated Adiabatic Lapse Rate (SALR)	N/a	A/H/M	N/a	A / H
	Environmental Lapse Rate (ELR)	N/a	A/H/M	N/a	A / H
	Relation SALR and DALR	N/a	A/H/M	N/a	A / H
	Absolute Stability	N/a	A/H/M	N/a	A / H
	Absolute Instability	N/a	A/H/M	N/a	A / H
	Conditional Instability	N/a	A/H/M	N/a	A / H
	Neutral Stability	N/a	A/H/M	N/a	A / H

1.7	WIND	PPL	CPL	IR	ATPL
	Buy Ballot's Law	N/a	A/H/M	N/a	A / H
	Coriolis Force	N/a	A/H/M	N/a	A / H
	Geostrophic Wind	A/H/M	A/H/M	N/a	A / H
	Gradient Wind	A/H/M	A/H/M	N/a	A / H
	Surface Friction	N/a	A/H/M	N/a	A / H
	Thermal wind	A/H/M	A/H/M	N/a	A / H
	Local winds	A/H/M	A/H/M	N/a	A / H
	The Föhn Wind	A/H/M	A/H/M	N/a	A / H
	The Berg Wind	A/H/M	A/H/M	N/a	A / H
	Anabatic Wind	A/H/M	A/H/M	N/a	A / H
	Katabatic Wind	A/H/M	A/H/M	N/a	A / H
	Sea Breeze	A/H/M	A/H/M	N/a	A / H
	Land Breeze	A/H/M	A/H/M	N/a	A / H
	Monsoon	N/a	A/H/M	N/a	A / H
	Trade Winds and the ITCZ (Inter Tropical Convergence Zone)	A/H/M	A/H/M	N/a	A / H
	Effect of wind gradient and windshear on take-off and landing	A/H/M	A/H/M	N/a	A/H
	Relationship between isobars and wind, Buys Ballot's law	A/H/M	A/H/M	N/a	A/H
	Turbulence and gustiness	A/H/M	A/H/M	N/a	A/H
	General Global Upper Wind Circulation	N/a	A/H/M	N/a	A / H
	Westerly Wind Waves	N/a	A/H/M	N/a	A / H
	Tropical Easterly wind Wave	N/a	A/H/M	N/a	A / H
	Jet Streams	N/a	A/H/M	N/a	A / H

1.8	AIR MASSES	PPL	CPL	IR	ATPL
	Definition of an Air mass	A/H/M	A/H/M	N/a	A / H
	Geographical Classification	A/H/M	A/H/M	N/a	A / H
	Moisture Content Classification	N/a	A/H/M	N/a	A / H
	Thermodynamic Classification	N/a	A/H/M	N/a	A / H
	Warm Air Masses	A/H/M	A/H/M	N/a	A / H
	Cold Air Masses	A/H/M	A/H/M	N/a	A / H
	Modification of an Air Mass	A/H/M	A/H/M	N/a	A / H

1.9	CLOUDS	PPL	CPL	IR	ATPL
	Causes of Cloud Formation	A/M/H	A/H/M	N/a	A / H
	Orographic cloud	A/H/M	A/H/M	N/a	A / H
	Convergent Cloud	N/a	A/H/M	N/a	A / H
	Convection Cloud	A/H/M	A/H/M	N/a	A / H
	Turbulent Cloud	N/a	A/H/M	N/a	A / H
	Frontal Cloud	N/a	A/H/M	N/a	A / H
	Cloud Classification	A/H/M	A/H/M	N/a	A / H
	Flying conditions in each cloud type	A/H/M	N/a	N/a	A/H
	Cloud Observations/ Amount and Height	A/H/M	A/H/M	N/a	A / H

1.10	FOG, MIST & HAZE	PPL	CPL	IR	ATPL
	Definition for Fog, Mist and Haze	A/H/M	A/H/M	N/a	A / H
	Radiation fog	A/H/M	A/H/M	N/a	A / H
	Advection fog	A/H/M	A/H/M	N/a	A / H
	Upslope fog	A/M	H	N/a	A / H
	Valley fog	A/M	H	N/a	A / H
	Frontal fog	A/M	H	N/a	A / H
	Smog	A/M	H	N/a	A / H
	Reduction of visibility due to mist, snow, smoke, dust and sand	A/M	H	N/a	A/H
	Assessment of probability of reduced visibility	A/M	H	N/a	A/H
	Hazards in flight due to low visibility, horizontal and vertical	A/M	H	N/a	A/H

1.11	VISIBILITY	PPL	CPL	IR	ATPL
	Definition of Visibility	A/H/M	H	N/a	A / H
	Glare	A/H/M	H	N/a	A / H
	Runway Visual Range (RVR)	A/H/M	H	N/a	A / H
	Visibility from the Air	A/H/M	H	N/a	A / H
	Visibility into Sun / Moon	A/H/M	H	N/a	A / H
	Causes of reduced visibility	A/H/M	H	N/a	A / H
	Effect of volcanic eruptions on visibility	A/H/M	A / H	N/a	A / H

1.12	PRECIPITATION	PPL	CPL	IR	ATPL
	Condensation Nuclei	A/H/M	A/H/M	N/a	A / H
	Ice Particle Theory	A/H/M	A/H/M	N/a	A / H
	Coalescence Theory	A/H/M	A/H/M	N/a	A / H
	Drizzle	A/H/M	A/H/M	N/a	A / H
	Rain	A/H/M	A/H/M	N/a	A / H
	Showers	A/H/M	A/H/M	N/a	A / H
	Snow	A/H/M	A/H/M	N/a	A / H
	Sleet	A/H/M	A/H/M	N/a	A / H
	Hail	A/H/M	A/H/M	N/a	A / H
	Freezing Rain	N/a	A/H/M	N/a	A / H
	Precipitation and Aviation	A/H/M	A/H/M	N/a	A / H

1.13	FRONTS	PPL	CPL	IR	ATPL
	Frontal Slope	A/H/M	A/H/M	N/a	A / H
	Stationary Front – Stage 1	A/H/M	A/H/M	N/a	A / H
	Start of a Front – Stage 2	A/H/M	A/H/M	N/a	A / H
	Frontal Wave – Stage 3	A/H/M	A/H/M	N/a	A / H
	Moving Front – Stage 4	A/H/M	A/H/M	N/a	A / H
	Occluded Front – Stage 5	A/H/M	A/H/M	N/a	A / H
	Dissipating Stage – Stage 6	A/H/M	A/H/M	N/a	A / H
	The Cold Front	A/H/M	A/H/M	N/a	A / H
	The Warm Front	A/H/M	A/H/M	N/a	A / H
	Occluded Fronts	A/H/M	A/H/M	N/a	A / H
	Factors determining Weather Intensity of Fronts	A/H/M	A/H/M	N/a	A / H

1.14	THUNDERSTORMS	PPL	CPL	IR	ATPL
	Developing Conditions	A/H/M	A/H/M	N/a	A / H
	Convective Thunderstorms	A/H/M	A/H/M	N/a	A / H
	Frontal Thunderstorms	A/H/M	A/H/M	N/a	A / H
	Convergent Thunderstorms	A/H/M	A/H/M	N/a	A / H
	Orographic Thunderstorms	A/H/M	A/H/M	N/a	A / H
	Nocturnal Thunderstorms	A/H/M	A/H/M	N/a	A / H
	Cellular Structure of Thunderstorms	A/H/M	A/H/M	N/a	A / H
	Cumulus Stage	A/H/M	A/H/M	N/a	A / H
	Mature Stage	A/H/M	A/H/M	N/a	A / H
	Dissipating Stage	A/H/M	A/H/M	N/a	A / H
	Surface Weather with Thunderstorms	N/a	N/a	N/a	A / H
	Flight Hazards with Thunderstorms	N/a	A/H/M	N/a	A / H
	Penetration Procedures	N/a	N/a	N/a	A / H
	After Entry	N/a	N/a	N/a	A / H
	Avoidance of Thunderstorms	A/H/M	A/H/M	N/a	A / H

1.15	TURBULENCE	PPL	CPL	IR	ATPL
	Definition of Turbulence	A/H/M	A/H/M	N/a	A / H
	Criteria for Turbulence	A/H/M	A/H/M	N/a	A / H
	Mechanical Turbulence	N/a	N/a	N/a	A / H
	Low-level Turbulence	N/a	N/a	N/a	A / H
	Wake Turbulence	N/a	N/a	N/a	A / H
	Mountain / Standing Waves	N/a	N/a	N/a	A / H
	Microburst	N/a	N/a	N/a	A / H
	Clear Air Turbulence – CAT	N/a	N/a	N/a	A / H
	Low-level Turbulence	N/a	N/a	N/a	A / H
	Terrain features causing Wind Shear Conditions	N/a	N/a	N/a	A / H
	Flying Techniques for Wind Shear Conditions	N/a	N/a	N/a	A / H

1.16	ICE ACCRETION	PPL	CPL	IR	ATPL
	Airframe Icing	A	A/H	N/a	A / H
	Hoar Frost	H	A	N/a	A / H
	Rime Ice	H	A	N/a	A / H
	Clear Ice	H	A	N/a	A / H
	Rain Ice	A/H	A/H	N/a	A / H
	Airframe Icing Protection Techniques	A/H	A/H	N/a	A / H

1.16	ICE ACCRETION	PPL	CPL	IR	ATPL
	Symptoms of and clearing of Carburettor Icing	A/H	A/H	N/a	A / H
	Throttle Icing	A/H	A/H	N/a	A / H
	Fuel Evaporation Icing	A/H	A/H	N/a	A / H
	Jet Engine Icing	N/a	N/a	N/a	A
	Impact Icing	N/a	N/a	N/a	A / H
	Dangers of Icing	A/H	A/H	N/a	A / H
	Avoiding Icing Regions	H	A	N/a	A / H

1.17	PRESSURE SYSTEMS	PPL	CPL	IR	ATPL
	Trough of Low Pressure	A/H/M	A/H/M	N/a	A / H
	Thermal Depression	A/H/M	A/H/M	N/a	A / H
	Orographic Depressions	A/H/M	A/H/M	N/a	A / H
	Coastal Low	A/H/M	A/H/M	N/a	A / H
	Tropic Cyclones	N/a	A/H/M	N/a	A / H
	Anti-cyclones (Highs)	N/a	A/H/M	N/a	A / H
	Cold Anti-cyclones	N/a	A/H/M	N/a	A / H
	Warm Anti-cyclones	N/a	A/H/M	N/a	A / H

1.18	CLIMATOLOGY	PPL	CPL	IR	ATPL
	General world circulation	A/H/M	A/M	N/a	A / H
	Basic climatic zones	A/H/M	A/H/M	N/a	A / H
	Some world weather systems	A/H/M	N/a	N/a	A / H
	Doldrums	N/a	A/H/M	N/a	A / H
	Trade Winds	N/a	A/H/M	N/a	A / H
	Horse Latitude & Westerly's	N/a	A/H/M	N/a	A / H
	Mozambique Summer patterns	A/H/M	A/M	N/a	A / H
	Mozambique Winter patterns	A/H/M	A/H/M	N/a	A / H
	The South Westerly Buster	A/H/M	A/H/M	N/a	A / H
	The Cape Doctor	A/H/M	A/H/M	N/a	A / H
	The Black South Easter	N/a	A/H/M	N/a	A / H

1.19	AIRCRAFT MET OBSERVATIONS	PPL	CPL	IR	ATPL
	Airep	N/a	A / H	N/a	A / H
	Position Information	A/H/M	A/H/M	N/a	A / H
	Aircraft identification	A/H/M	A/H/M	N/a	A / H
	Position	A/H/M	A/H/M	N/a	A / H
	Time	A/H/M	A/H/M	N/a	A / H
	Flight level or altitude	A/H/M	A/H/M	N/a	A / H
	Next position and ETA	A/H/M	A/H/M	N/a	A / H
	Operational Information	A/H/M	A/H/M	N/a	A / H
	Destination	A/H/M	A/H/M	N/a	A / H
	Endurance	A/H/M	A/H/M	N/a	A / H
	Meteorological Information	A/H/M	A/H/M	N/a	A / H
	Outside air temperature	M	A / H	N/a	A / H
	Wind direction and wind speed	A/H/M	A/H/M	N/a	A / H
	Turbulence	A/H	A / H	N/a	A / H
	Aircraft icing	A/H	A / H	N/a	A / H
	Cloud base and cloud tops	A/H/M	A/H/M	N/a	A / H
	Supplementary information	N/a	A / H	N/a	A / H
	ASDAR and ADMAR Systems	N/a	A / H	N/a	A / H
	Weather Satellite	N/a	A / H	N/a	A / H
	orbits	N/a	A / H	N/a	A / H

1.19	AIRCRAFT MET OBSERVATIONS	PPL	CPL	IR	ATPL
	polar	N/a	A / H	N/a	A / H
	geostationary	N/a	A / H	N/a	A / H
	Advantages / disadvantages	N/a	A / H	N/a	A / H
	Imagery	N/a	A / H	N/a	A / H
	Data Collecting and relay	N/a	A / H	N/a	A / H
	Current operational Satellites	N/a	A / H	N/a	A / H
	Internet + WWW Satellite data	N/a	A / H	N/a	A / H

1.20	SYNOPS AND SYNOPTICS	PPL	CPL	IR	ATPL
	Station Model	N/a	A / H	N/a	A / H
	Synoptic Charts	A	A / H	N/a	A / H
	Drawing of Isobars	A	A / H	N/a	A / H
	Synoptics	N/a	A / H	N/a	A / H

1.21	CODES / DOCUMENTATION	PPL	CPL	IR	ATPL
	Metar	N/a	A / H	N/a	A / H
	Speci	N/a	A / H	N/a	A / H
	Taf	N/a	A / H	N/a	A / H
	Actual Upper winds	N/a	A / H	N/a	A / H
	Prognostic Upper winds	N/a	A / H	N/a	A / H
	Local and world wide Significant Weather Charts	N/a	A / H	N/a	A / H

1.22	METEOROLOGICAL ORGANISATIONS	PPL	CPL	IR	ATPL
	World Meteorological Organisation	A	A / H	N/a	A / H
	International Civil Aviation Organisation	A/H	A / H	N/a	A / H
	Mozambique Weather Bureau – SAWB	A/H/M	A/H/M	N/a	A / H
	Central Forecasting Office – CFO	A/H/M	A/H/M	N/a	A / H
	Main Forecasting Offices – MFO	A/H/M	A/H/M	N/a	A / H
	Weather Offices – WO	A/H/M	A/H/M	N/a	A / H
	Subsidiary Stations	A	A / H	N/a	A / H
	Automatic Weather Stations (AWS)	A	A / H	N/a	A / H
	Weather services for Aviation	A	A / H	N/a	A / H

2. FLIGHT PLANNING AND PERFORMANCE

2.1	DEFINITIONS AND TERMS ICAO, ANNEX 6	PPL	CPL	IR	ATPL
	Airspeed terminology and symbols	A/M	A/H/M	N/a	A / H
	RAIS, RCAS, RTAS, Mach numbers	A/M	A/H/M	N/a	A / H
	VA, VFO, VFE, VF	N/a	A / H	N/a	A / H
	VLO, VLE	N/a	A / H	N/a	A / H
	VNO, VNE	N/a	A / H	N/a	A / H
	VX, VY	N/a	A / H	N/a	A / H
	VMO, MMO	N/a	A / H	N/a	A / H
	VMCA, VMCG	N/a	A / H	N/a	A / H
	VS, VSO	N/a	A / H	N/a	A / H
	VSSE	N/a	A / H	N/a	A / H
	VI, VR, V2, VREF, VLOF, VMBE	A/H/M	A/H/M	N/a	A / H
	Meteorological terminology (ISA, JSA)	A/H/M	A/H/M	N/a	A / H
	OAT, IOTA, TAT, SAT, RAT	N/a	A / H	N/a	A / H
	Temperature deviation from ISA	A/H/M	A/H/M	N/a	A / H
	Pressure altitude	A/H/M	A/H/M	N/a	A / H

2.1	DEFINITIONS AND TERMS ICAO, ANNEX 6	PPL	CPL	IR	ATPL
	Density altitude	A/H/M	A/H/M	N/a	A / H
	Aerodrome pressure	A/H	A / H	N/a	A / H
	Aerodrome terminology	A/H/M	A/H/M	N/a	A / H
	Balanced and unbalanced field lengths	A/H/M	A/H/M	N/a	A / H
	Clearway, stopway	A/H/M	A/H/M	N/a	A / H
	TORA (take-off run available)	A/H	A / H	N/a	A / H
	TODA (take-off distance available)	A/H/M	A/H/M	N/a	A / H
	EMDA (emergency distance available)	A/H/M	A/H/M	N/a	A / H
	WAT limits	A/H	A / H	N/a	A / H
	LDA (landing distance available)	A	A / H	N/a	A / H
	Displaced threshold	A	A / H	N/a	A / H
	Runway slope	A/M	A / H	N/a	A / H
	Runway strength	A/M	A / H	N/a	A / H
	Load classification number	N/a	A / H	N/a	A / H
	Single isolated wheel loading	N/a	A / H	N/a	A / H
	Take-off flight plan	A/M	A / H	N/a	A / H

2.2	AEROPLANE MANUALS Use of graphs or tables to determine, where applicable:-	PPL	CPL	IR	ATPL
	Take-off	A/M	A	N/a	A
	Take-off run (TORA)	A/M	A	N/a	A
	Take-off distance (TODA)	A/M	A	N/a	A
	Take-off speeds (V1, VR, V2)	A/M	A	N/a	A
	Maximum take-off mass	A/M	A	N/a	A
	Accelerate-go distance	A/M	A	N/a	A
	Accelerate-stop distance (ASDA)	A/M	A	N/a	A
	VMCA, VMCG limits	A/M	A	N/a	A
	Anti-skid inoperative	A/M	A	N/a	A
	Reduced braking capability	A/M	A	N/a	A
	Tyre speed limits	A/M	A	N/a	A
	Power settings	A/M	A	N/a	A
	Cruise	A/H/M	A/H/M	N/a	A
	Constant-power cruise	A/H/M	A/H/M	N/a	A
	Constant-speed cruise	A/H/M	A/H/M	N/a	A
	Long-range cruise	A/H/M	A/H/M	N/a	A
	Optimum altitude	A/H/M	A/H/M	N/a	A
	Range	A/H/M	A/H/M	N/a	A
	Endurance	A/H/M	A/H/M	N/a	A
	Fuel consumption, fuel used, fuel flow	A/H/M	A/H/M	N/a	A
	ANM / fuel ratio	A/H/M	A/H/M	N/a	A
	GNM / fuel ratio	A/H/M	A/H/M	N/a	A
	Wind components, wind range correction / trade off	A/H/M	A/H/M	N/a	A
	Mid zone masses	N/a		N/a	A
	One engine inoperative	N/a	A / H	N/a	A
	In-flight diversion	N/a	A/H	N/a	A
	Integrated range tables	N/a	A/H	N/a	A
	Simplified flight planning graphs	A/H/M	M	N/a	A
	Step climb to optimum altitude	N/a	N/a	N/a	A
	Power settings	A/H/M	A/H/M	N/a	A

2.2	AEROPLANE MANUALS Use of graphs or tables to determine, where applicable:-	PPL	CPL	IR	ATPL
	Fuel management	A/H/M	A/H/M	N/a	A/H
	Alternate planning	N/a	A/H	N/a	A/H
	Re dispatch planning	N/a	A/H	N/a	A/H
	Contingency allowance	A/H/M	A/H/M	N/a	A/H
	Descent	A/H	A / H	N/a	A
	Time, distance, fuel used	A/H/M	A/H/M	N/a	A/H
	Reserve fuel	A/H/M	N/a	N/a	A/H
	Holding fuel	A/H	A / H	N/a	A/H
	Contingency allowance	A/H/M	N/a	N/a	A/H
	Approach and landing fuel	N/a	N/a	N/a	A
	Minimum in tanks	A/H/M	A/H/M	N/a	A/H
	Landing	A	H	N/a	A
	Maximum landing mass	A/M	N/a	N/a	A
	Landing distance	A/M	A/M	N/a	A
	Landing ground roll	A/M	A/M	N/a	A
	Anti-skid inoperative	N/a	N/a	N/a	A
	Reverse thrust	N/a	N/a	N/a	A
	Flight Plan	A/H/M	A/H/M	N/a	A
	Completion of fuel flight plan	A/H/M	A/H/M	N/a	A
	Miscellaneous graphs	A/H/M	A/H/M	N/a	A
	Airspeed calibration	A/H/M	A/H/M	N/a	A
	Stall speeds	A/M	A	N/a	A
	Altimeter calibration	A/H/M	A/H/M	N/a	A
	Indicated outside air temperature (IOAT)	A/H/M	A/H/M	N/a	A
	Total air temperature	N/a	N/a	N/a	A
	Stall speeds	A/H/M	A/H/M	N/a	A
	Pressurisation controller settings	N/a	N/a	N/a	A

2.3	MASS AND BALANCE	PPL	CPL	IR	ATPL
	Terminology	A/H/M	A/H/M	N/a	A / H
	Arm	A/H/M	A/H/M	N/a	A / H
	Movement	A/H/M	A/H/M	N/a	A / H
	Reference datum	A	A / H	N/a	A / H
	Station	A	A / H	N/a	A / H
	Centre of gravity	A/H/M	A/H/M	N/a	A / H
	CG arm	A/H/M	A/H/M	N/a	A / H
	CG limits	A/H/M	A/H/M	N/a	A / H
	Mean aerodynamic chord (MAC)	N/a	A / H	N/a	A / H
	(LEMAC)	N/a	A / H	N/a	A / H
	Maximum ramp and taxi mass	A	A / H	N/a	A / H
	Maximum take-off mass	A/H/M	A/H/M	N/a	A / H
	Maximum zero fuel mass	A/H/M	A/H/M	N/a	A / H
	Empty operating mass	A	A/H/M	N/a	A / H
	Cargo pallets	N/a	A/H/M	N/a	A / H
	Maximum floor load	N/a	A/H/M	N/a	A / H
	Load sheet and trim sheet	N/a	A / H	N/a	A / H
	Preparation of load sheet and trim sheet	N/a	A / H	N/a	A / H
	Calculation of CG	A	A/H/M	N/a	A / H
	Movement of CG in flight	A	A/H/M	N/a	A / H
	Maximum load at station	A	A/H/M	N/a	A / H

	Ballast	N/a	A / H	N/a	A / H
2.4	PET & PNR	PPL	CPL	IR	ATPL
	PET (Point of equal time)	N/a	A / H	N/a	A / H
	All engines operating	N/a	A / H	N/a	A / H
	One engine inoperative (critical point)	N/a	A / H	N/a	A / H
	With alternate aerodrome	N/a	A / H	N/a	A / H
	PNR (Point of no return)	N/a	A / H	N/a	A / H
	With or without reserve fuel	N/a	A / H	N/a	A / H
	With alternate aerodrome	N/a	A / H	N/a	A / H

3. RADIO AND COMMUNICATION

3.1	BASIC RADIO THEORY	PPL	CPL	IR	ATPL
	Electromagnetic waves	A/H	A / H	N/a	A / H
	Frequency, wavelength, cycle, phase, amplitude	A/H/M	A/H/M	N/a	A / H
	Frequency bands	A/H/M	A/H/M	N/a	A / H
	Sidebands, double sideband, single sideband, bandwidth	A/H/M	A/H/M	N/a	A / H
	Carrier wave, modulation, demodulation	N/a	A/H/M	N/a	A / H
	Amplitude demodulation	N/a	A/H/M	N/a	A / H
	Frequency demodulation	N/a	A/H/M	N/a	A / H
	Pulse modulation	N/a	A/H/M	N/a	A / H
	Multiplex	N/a	A/H/M	N/a	A / H
	Designation of emission	N/a	A/H/M	N/a	A / H
	Signal / noise ratio	N/a	A/H/M	N/a	A / H
	Antennae		A / H	N/a	A / H
	Characteristics	A/H/M	A/H/M	N/a	A / H
	Polarisation	A/H/M	A/H/M	N/a	A / H
	Polar diagram	A/H/M	A/H/M	N/a	A / H
	Types of antennae	A/H/M	A/H/M	N/a	A / H
	Wave propagation	A/H	A / H	N/a	A / H
	Ground waves	A/H/M	A/H/M	N/a	A / H
	Direct waves	A/H/M	A/H/M	N/a	A / H
	Sky waves	A/H/M	A/H/M	N/a	A / H
	Ionosphere, critical angle skip distance, dead space, refraction	N/a	A / H	N/a	A / H
	Frequency prognosis (MUF)	N/a	A / H	N/a	A / H
	Fading	N/a	A/H/M	N/a	A / H
	Factors affecting propagation (reflection, absorption, attenuation, coastline, mountain, static)	N/a	A/H/M	N/a	A / H
	Communication	A/H/M	A/H/M		A / H
	VHD communications	A/H/M	A/H/M		A / H
	HF communications	A/H/M	A/H/M		A / H
	Selcal	A/H/M	A/H/M		A / H
	SATCOM	A/H/M	A/H/M	N/a	A / H
	Principle	A/H/M	A/H/M	N/a	A / H
	Advantages	A/H/M	A/H/M	N/a	A / H
	Orbital plane and coverage	N/a	A / H	N/a	A / H
	Frequency band used by aircraft	N/a	A / H	N/a	A / H

3.1	BASIC RADIO THEORY	PPL	CPL	IR	ATPL
	Function of ground station segment	N/a	A / H	N/a	A / H
	Services supported	N/a	A / H	N/a	A / H
	Ground Direction Finding (GDF)	A/H/M	A/H/M	N/a	A / H
	Principles	A/H/M	A/H/M	N/a	A / H
	Range	N/a	A/H/M	N/a	A / H
	Errors and accuracy	N/a	A/H/M	N/a	A / H
	Classification of bearings	N/a	A/H/M	N/a	A / H
	ADF (Automatic Direction Finding)	A/H/M	A/H/M	N/a	A / H
	NDB (Non-directional Beacon)	A/H/M	A/H/M	N/a	A / H
	A1A, A2A emissions, frequencies	A/H/M	A/H/M	N/a	A / H
	ADF loop theory	A/H/M	A/H/M	N/a	A / H
	Rotating loop antenna	A/H/M	A/H/M	N/a	A / H
	Fixed loop antenna	A/H/M	A/H/M	N/a	A / H
	Range and coverage	A/H/M	A/H/M	N/a	A / H
	Errors	A/H/M	A/H/M	N/a	A / H
	Accuracy	A/H/M	A/H/M	N/a	A / H
	Factors affecting range and accuracy	A/H/M	A/H/M	N/a	A / H
	RBI (Relative Bearing Indicator)	A/H/M	A/H/M	N/a	A / H
	RMI (Relative Magnetic Indicator)	A/H/M	A/H/M	N/a	A / H
	Calculations	A/H/M	A/H/M	N/a	A / H
	VOR	A/H/M	A/H/M	N/a	A / H
	Principles	A/H/M	A/H/M	N/a	A / H
	Presentation and interpretation	A/H/M	A/H/M	N/a	A / H
	Range and coverage	A/H/M	A/H/M	N/a	A / H
	Errors and accuracy	A/H/M	A/H/M	N/a	A / H
	Factors affecting range and accuracy	A/H/M	A/H/M	N/a	A / H
	Doppler VOR	A/H/M	A/H/M	N/a	A / H
	TVOR (Terminal VOR)	A/H/M	A/H/M	N/a	A / H
	CDI (Course Deviation Indicator)	A/H/M	A/H/M	N/a	A / H
	Calculations	A/H/M	A/H/M	N/a	A / H
	Frequencies	A/H/M	A/H/M	N/a	A / H
	ILS (Instrument Landing System)	A	A / H	N/a	A / H
	Principles	A	A / H	N/a	A / H
	Presentation and interpretation	A	A / H	N/a	A / H
	Back beam	A/H	A / H	N/a	A / H
	Range and coverage	A/H	A / H	N/a	A / H
	Errors and accuracy	A/H	A / H	N/a	A / H
	Factors affecting range and accuracy	N/a	A / H	N/a	A / H
	Categories	N/a	A / H	N/a	A / H
	Frequencies	N/a	A / H	N/a	A / H
	Calculations	N/a	A / H	N/a	A / H
	MLS (Microwave Landing Systems)	A/H	A / H	N/a	A / H
	Principles	A/H	A / H	N/a	A / H
	Presentation and interpretation	A/H	A / H	N/a	A / H
	Range and coverage	A/H	A / H	N/a	A / H
	Errors and accuracy	A/H	A / H	N/a	A / H
	Factors affecting range and accuracy	N/a	A / H	N/a	A / H
	Radio Altimeter	A/H/M	A/H/M	N/a	A / H
	Principle	A/H/M	A/H/M	N/a	A / H
	Frequency band	A/H	A/H/M	N/a	A / H
	Presentation and interpretation	A/H	A/H/M	N/a	A / H
	Errors and accuracy	A/H	A/H/M	N/a	A / H

3.1	BASIC RADIO THEORY	PPL	CPL	IR	ATPL
	Calculations	A/H	A/H/M	N/a	A / H
	GPWS (Ground Proximity Warning System)	A/H	A / H	N/a	A / H
	Principles	A/H	A / H	N/a	A / H
	Modes of operation	A/H	A / H	N/a	A / H
	ELT (Emergency Locator Transmitter)	A/H/M	A/H/M	N/a	A / H
	Principles	A/H/M	A/H/M	N/a	A / H
	Frequencies	A/H	A / H	N/a	A / H
	Testing	A/H	A / H	N/a	A / H

3.2	BASIC RADAR THEORY	PPL	CPL	IR	ATPL
	Pulse techniques	A/H	A / H	N/a	A / H
	Associated terminology	A/H	A / H	N/a	A / H
	Primary radar	A/H	A / H	N/a	A / H
	Secondary radar	A/H	A / H	N/a	N/a
	Cathode Ray Tube (CRT)	N/a	A / H	N/a	A / H
	Ground Radar	A/H	A / H	N/a	A / H
	Principles	A/H	A / H	N/a	A / H
	Presentation and interpretation	A/H	A / H	N/a	A / H
	Range and coverage	A/H	A / H	N/a	A / H
	Errors and accuracy	N/a	A / H	N/a	A / H
	Factors affecting range and accuracy	N/a	A / H	N/a	A / H
	Calculations	N/a	A / H	N/a	A / H
	Principles	A/H	A / H	N/a	A / H
	Presentation and interpretation	A/H	A / H	N/a	A / H
	Range and coverage	A/H	A / H	N/a	A / H
	Errors and accuracy	A/H	A / H	N/a	A / H
	Frequencies	A/H	A / H	N/a	A / H
	DME / P (precision DME)	A/H	A / H	N/a	A / H
	Airborne Weather Radar	A/H	A / H	N/a	A / H
	Principles	A/H	A / H	N/a	A / H
	Presentation and interpretation	A/H	A / H	N/a	A / H
	Range and coverage	A/H	A / H	N/a	A / H
	Errors and accuracy	A/H	A / H	N/a	A / H
	Factors affecting range and accuracy	A/H	A / H	N/a	A / H
	SSR (Secondary Surveillance Radar)	A/H	A / H	N/a	A / H
	Principles	A/H	A / H	N/a	A / H
	Modes and codes	A/H	A / H	N/a	A / H
	TCAS / ACAS (Traffic Alert and Collision Avoidance System)	A/H	A / H	N/a	A / H
	Principles	A/H	A / H	N/a	A / H
	Doppler Radar	A/H	A / H	N/a	A / H
	Principles	A/H	A / H	N/a	A / H
	Groundspeed and drift calculation	A/H	A / H	N/a	A / H
	Errors and accuracy	A/H	A / H	N/a	A / H

3.3	RNAV (VOR / DME AREA NAVIGATION)	PPL	CPL	IR	ATPL
	Principles	A/H	A / H	N/a	A / H
	Range and coverage	A/H	A / H	N/a	A / H
	Errors and accuracy	A/H	A / H	N/a	A / H
	Approach mode	A/H	A / H	N/a	A / H
	Calculations	A/H	A / H	N/a	A / H

3.4	SATELLITE NAVIGATION	PPL	CPL	IR	ATPL
	GPS (Global Positioning System)	A/H	A / H	N/a	A / H
	System components, constellation, control and user	N/a	A / H	N/a	A / H
	Aircraft equipment requirements	A/H	A / H	N/a	A / H
	GPS satellite signal and pseudo random code	N/a	A / H	N/a	A / H
	Principles of position fixing	N/a	A / H	N/a	A / H
	Method of minimising receiving clock error	N/a	A / H	N/a	A / H
	Minimum satellites required for navigation functions	N/a	A / H	N/a	A / H
	Masking function	N/a	A / H	N/a	A / H
	Performance limitations of various equipment types	N/a	A / H	N/a	A / H
	GPS use of WGS84 co-ordinate system	N/a	A / H	N/a	A / H
	Navigation system performance requirements	A/H	A / H	N/a	A / H
	Accuracy	A/H	A / H	N/a	A / H
	Integrity	A/H	A / H	N/a	A / H
	Means of providing GPS integrity, RAIM, procedural systems integration	N/a	A / H	N/a	A / H
	Availability	N/a	A / H	N/a	A / H
	Continuity of service	N/a	A / H	N/a	A / H
	GPS errors and limitations	A/H	A / H	N/a	A / H
	Ephemeris	N/a	A / H	N/a	A / H
	Clock	N/a	A / H	N/a	A / H
	Receiver	N/a	A / H	N/a	A / H
	Atmospheric / Ionospheric	N/a	A / H	N/a	A / H
	Multipath	N/a	A / H	N/a	A / H
	MOZAMBIQUE availability	A/H	A / H	N/a	A / H
	Typical total error associated with C/A code	N/a	A / H	N/a	A / H
	Effect of PDOP / GDOP on position accuracy	N/a	A / H	N/a	A / H
	Susceptibility to interference	N/a	A / H	N/a	A / H
	Comparison of vertical and horizontal errors	N/a	A / H	N/a	A / H
	Tracking accuracy and collision avoidance	A/H	A / H	N/a	A / H
	Human Factors and GPS	A/H	A / H	N/a	A / H
	Mode errors	N/a	A / H	N/a	A / H
	Data entry errors	N/a	A / H	N/a	A / H
	Data validation and checking including independent cross-checking procedures	N/a	A / H	N/a	A / H
	Automation induced complacency	N/a	A / H	N/a	A / H
	Non-standardisation of the GPS-pilot interface	N/a	A / H	N/a	A / H
	Human information processing and situation awareness	N/a	A / H	N/a	A / H
	GPS equipment Operational modes	N/a	A / H	N/a	A / H
	Accessing information contained in the navigation database	N/a	A / H	N/a	A / H
	Predict RAIM availability	N/a	A / H	N/a	A / H
	Entry of user defined waypoints	N/a	A / H	N/a	A / H
	Enter / retrieve flight plan data	N/a	A / H	N/a	A / H
	Interpret typical GPS navigation displays LAT / LONG, distance and bearing to waypoint, CDI	N/a	A / H	N/a	A / H
	Intercept and maintain GPS defined tracks	N/a	A / H	N/a	A / H
	Determine TMG, GS, ETA, time and distance to	N/a	A / H	N/a	A / H

3.4	SATELLITE NAVIGATION	PPL	CPL	IR	ATPL
	WPT, WV in flight				
	Indication of waypoint passage	N/a	A / H	N/a	A / H
	Use of direct to function	A/H	A / H	N/a	A / H
	Use of nearest aerodrome function	A/H	A / H	N/a	A / H
	Use of GPS in GPS and VOR / DME / GPS arrival procedures	A/H	A / H	N/a	A / H
	GPS equipment check	A/H	A / H	N/a	A / H
	TSO	A/H	A / H	N/a	A / H
	Satellite required	A/H	A / H	N/a	A / H
	RAIM status	N/a	A / H	N/a	A / H
	PDOP / GDOP status	N/a	A / H	N/a	A / H
	IFR database currency	N/a	A / H	N/a	A / H
	Receiver serviceability	N/a	A / H	N/a	A / H
	CDI sensitivity	N/a	A / H	N/a	A / H
	Position indication	N/a	A / H	N/a	A / H
	GPS warning and messages	A/H	A / H	N/a	A / H
	Loss of RAIM	A/H	A / H	N/a	A / H
	2D Navigation	N/a	A / H	N/a	A / H
	In Dead Reckoning mode	N/a	A / H	N/a	A / H
	Database out of date	A/H	A / H	N/a	A / H
	GPS fail	A/H	A / H	N/a	A / H
	Barometric input fail	N/a	A / H	N/a	A / H
	Power / battery fail	A/H	A / H	N/a	A / H
	Parallel offset on	N/a	A / H	N/a	A / H
	Satellite fail	A/H	A / H	N/a	A / H

4. GENERAL NAVIGATION

4.1	THE EARTH	PPL	CPL	IR	ATPL
	Latitude, difference of latitude	A/H/M	A/H/M	N/a	A / H
	Longitude, difference of longitude	A/H/M	A/H/M	N/a	A / H
	Use of latitude and longitude co-ordinates to locate any specific position	A/H/M	A/H/M	N/a	A / H
	Great circle, small circle, rhumbline, convergency, conversion angle, great circle and rhumbline tracks and bearing calculations	A/H/M	A/H/M	N/a	A / H
	Direction	A/H/M	A/H/M	N/a	A / H
	True north, magnetic north, compass north, isogonals, variation, compass deviation	A/H/M	A/H/M	N/a	A / H
	Distance	A/H/M	A/H/M	N/a	A / H
	Nautical mile, statute mile, kilometre, metre, yard, feet, inch	A/H/M	A/H/M	N/a	A / H
	Conversion from one unit to another	A/H/M	A/H/M	N/a	A / H
	Standard nautical mile (6080 feet)	A/H/M	A/H/M	N/a	A / H
	International nautical mile (1852 metres)	A/H/M	A/H/M	N/a	A / H
	Geographical nautical mile (6087 feet)	A/H/M	A/H/M	N/a	A / H
	Departure	A/H/M	A/H/M	N/a	A / H
	Relationship between nautical miles and minutes of longitude, calculations	A/H/M	A/H/M	N/a	A / H
	Radio bearings	A/H/M	A/H/M	N/a	A / H

4.1	THE EARTH	PPL	CPL	IR	ATPL
	QTE, QDR, QDM, QUJ	A/H	A / H	N/a	A / H
	Navigational computer (slide rule) electronic navigation computers, units used	A/H	A / H	A/H	A / H

4.2	CHARTS	PPL	CPL	IR	ATPL
	Chart projection theory	A/H/M	A/H/M	N/a	A / H
	Orthomorphism	A/H/M	A/H/M	N/a	A / H
	Scale, chart length, earth distance, scale factor, representative fraction, scale problems	A/H/M	A/H/M	N/a	A / H
	Mercator chart	A/H	A / H	N/a	A / H
	Construction and properties, representation of great circle, rhumbline, meridians, parallels of latitude	A/H	A / H	N/a	A / H
	Plotting radio bearings	A/H	A / H	N/a	A / H
	Scale variation and calculations	A/H	A / H	N/a	A / H
	Measurement or calculation of tracks and distance	A/H	A / H	N/a	A / H
	Meridional parts	A/H	A / H	N/a	A / H
	Lambert Conformal Conic	A/H	A / H	N/a	A / H
	Construction and properties	A/H	A / H	N/a	A / H
	Representation of great circle, rhumb lines meridians and parallels of latitude	A/H	A / H	N/a	A / H
	Plotting radio bearings	A/H	A / H	N/a	A / H
	Scale variation and calculations	A/H	A / H	N/a	A / H
	Measurement or calculation of tracks and distance	A/H	A / H	N/a	A / H
	Polar Stereographic	A/H	A / H	N/a	A / H
	Construction and properties	A/H	A / H	N/a	A / H
	Representation of great circles, rhumb lines, meridians and parallels of latitude	N/a	A / H	N/a	A / H
	Plotting radio bearings	N/a	A / H	N/a	A / H
	Scale variation and calculations	N/a	A / H	N/a	A / H
	Measurement or calculation of tracks and distance	N/a	A / H	N/a	A / H
	Grid navigation	A/H	A / H	N/a	A / H
	Grid superimposed on Lamberts and Polar Stereographic charts	A/H	A / H	N/a	A / H
	Grid north, isogrivs, grivation	A/H	A / H	N/a	A / H
	Calculation of true, magnetic and grid headings or track	A/H	A / H	N/a	A / H

4.3	RELATIVE VELOCITY	PPL	CPL	IR	ATPL
	Speed of opening and closing	A/H	A / H	N/a	A / H
	Aircraft separation	A/H	A / H	N/a	A / H
	Controlled time of arrival by changing speed	A/H	A / H	N/a	A / H
	Line of constant bearing	A/H	A / H	N/a	A / H

4.4	SOLAR SYSTEM – TIME	PPL	CPL	IR	ATPL
	Measurement of time	A/H/M	A/H/M	N/a	A / H
	The solar system	A/H/M	A/H/M	N/a	A / H
	Apparent solar day	A/H/M	A/H/M	N/a	A / H
	Mean solar day	A/H/M	A/H/M	N/a	A / H
	Sidereal day	A/H/M	A/H/M	N/a	A / H
	Equinox, solstice, aphelion, perihelion	A/H	A / H	N/a	A / H
	Tropics of Cancer, Capricorn	A/H	A / H	N/a	A / H
	Arctic and Antarctic circles	A/H	A / H	N/a	A / H
	UTC, GMT, LMT, Standard time	A/H	A / H	N/a	A / H
	Time conversions	A/H	A / H	N/a	A / H
	International Date Line	A/H	A / H	N/a	A / H
	Determination of Sunrise, Sunset, Civil Twilight	A/H	A / H	N/a	A / H
	Variation of the time of Sunrise, Sunset with latitude and altitude	A/H	A / H	N/a	A / H
	Sunrise and Sunset along track	A/H	A / H	N/a	A / H
	Moonrise, Moonset	A/H	A / H	N/a	A / H

4.5	DEAD RECKONING (DR) NAVIGATION	PPL	CPL	IR	ATPL
	Basics of DR	A/H	A/ H	N/a	A / H
	Track	A/H	A/ H	N/a	A / H
	Heading (true, magnetic, compass)	A/H	A/ H	N/a	A / H
	Wind velocity	A/H	A/ H	N/a	A / H
	Airspeed (IAS, RAS, TAS, Mach number)	A/H	A/ H	N/a	A / H
	Groundspeed	A/H	A/ H	N/a	A / H
	ETA	A/H	A/ H	N/a	A / H
	Drift, wind correction angle	A/H	A/ H	N/a	A / H
	DR Position, fix	A/H	A/ H	N/a	A / H
	Use of the navigational computer	A/H	A/ H	N/a	A / H
	Speed, distance, time	A/H	A/ H	N/a	A / H
	Fuel consumption	A/H	A/ H	N/a	A / H
	Conversion	A/H	A/ H	N/a	A / H
	Heading, track, groundspeed	A/H	A/ H	N/a	A / H
	RAS, TAS, compressibility correction	A/H	A/ H	N/a	A / H
	Wind velocity	A/H	A/ H	N/a	A / H
	Triangle of velocities, determination of	A/H	A/ H	N/a	A / H
	Heading	A/H	A/ H	N/a	A / H
	Track	A/H	A/ H	N/a	A / H
	Groundspeed	A/H	A/ H	N/a	A / H
	Wind velocity	A/H	A/ H	N/a	A / H
	Drift	A/H	A/ H	N/a	A / H
	Track error	A/H	A/ H	N/a	A / H

5. NAVIGATION (PLOTING)

5.1	NAVIGATION ON THE CLIMB AND DESCENT	PPL	CPL	IR	ATPL
	Mean climb TAS	A/H	A/ H	N/a	A / H
	Mean climb wind velocity	A/H	A/ H	N/a	A / H
	Groundspeed	A/H	A/ H	N/a	A / H
	Distance flown	A/H	A/ H	N/a	A / H
	Mean W / V en route	A/H	A/ H	N/a	A / H

5.2	EN ROUTE NAVIGATION	PPL	CPL	IR	ATPL
	Air plot	A/H	A/ H	N/a	A / H
	Track plot	A/H	A/ H	N/a	A / H
	DR position	A/H	A/ H	N/a	A / H
	Use of signal position lines, groundspeed check, back bearing, track made good	A/H	A/ H	N/a	A / H
	Running fix, transfer of position lines	A/H	A/ H	N/a	A / H
	Off-track corrections	A/H	A/ H	N/a	A / H
	Revised ETA	A/H	A/ H	N/a	A / H
	1-in-60 rule, alteration of heading	A/H	A/ H	N/a	A / H
	Double the angle on the bow	A/H	A/ H	N/a	A / H
	Relative bearing when abeam NDB	A/H	A/ H	N/a	A / H
	Air plot wind velocity	A/H	A/ H	N/a	A / H
	Track and groundspeed wind velocity	A/H	A/ H	N/a	A / H
	Doppler wind velocity	A/H	A/ H	N/a	

5.3	SEARCH PATTERN	PPL	CPL	IR	ATPL
	Simple searches		A/ H	N/a	A / H
	Square search		A/ H	N/a	A / H

6. OPERATIONAL PROCEDURES

6.1	DEFINITIONS AND ABBREVIATIONS APPLICABLE TO INSTRUMENT FLYING	PPL	CPL	IR	ATPL
	Definitions and Abbreviations	A/H/M	A/H/M	N/a	A

6.2	ICAO DOCUMENT 8168 – VOLUME I “FLIGHT PROCEDURES”	PPL	CPL	IR	ATPL
		A/H	H		A
	“APPROACH PROCEDURES”	A/H/M	A/H/M	X	A
	Chapter 1 – General Criteria	PPL	CPL	IR	ATPL
	The Instrument approach procedure	N/a	A/H	X	A
	Categories of aircraft	A/H/M	A/H/M	X	A
	Obstacle clearance	A/H/M	A/H/M	X	A
	Obstacle clearance altitude / height (OCA/H)	A/H/M	A/H/M	X	A
	Factors affecting operational minima	A/H/M	A/H/M	X	A
	Chapter 2 - Approach Procedure Design	PPL	CPL	IR	ATPL
	Instrument approach areas	N/a	A/H	X	A
	Chapter 3 - Approach Segments	PPL	CPL	IR	ATPL
	General	A/H	A	X	A/H
	Standard instrument arrivals	N/a	A	X	A/H
	Initial approach segment	N/a	A	X	A/H
	Intermediate Approach segment	N/a	A	X	A/H

6.2	ICAO DOCUMENT 8168 – VOLUME I “FLIGHT PROCEDURES”	PPL	CPL	IR	ATPL
	Final Approach segment	N/a	A	X	A/H
	Missed Approach	N/a	A	X	A/H
	HOLDING APPROACH	PPL	CPL	IR	ATPL
	Chapter 1				A
	Shape and terminology associated with holding pattern	A	A/M	X	A
	Speeds, rate of turn, timing, distance and limiting radial	N/a	A/M	X	A
	Entry	N/a	A/M	X	A
	Holding	N/a	A/M	X	A
	Chapter 2	N/a	A/M	X	A
	Holding area	N/a	A/M	X	A
	Buffer area	N/a	A/M	X	A
	Minimum holding level	N/a	A/M	X	A
	ALTIMETER SETTING PROCEDURES	PPL	CPL	IR	ATPL
					A
	Chapter 1 – Basic Requirements	A/H	A	N/a	A
	Chapter 2 – Procedures applicable to operators and pilots	A/H	A	N/a	A
	Pre-flight operational test	A/H	A	N/a	A

6.3	AERONAUTICAL INFORMATION PUBLICATION (AIP) IN MOZAMBIQUE	PPL	CPL	IR	ATPL
	ARRIVAL AND DEPARTURE PROCEDURES	A/H/M	A/M	N/a	A
	AIP ENR 1.9 – Air Traffic flow management	A/H/M	A/M	N/a	A
	Slot time selectors	N/a	A	N/a	A
	Slot times	N/a	A	N/a	A
	AIP ENR 1.5 – Approach procedures	PPL	CPL	IR	ATPL
	General	A/H	A	N/a	A
	Arriving flights	A	A	N/a	A
	General procedures for arriving aircraft	A/H	A/H/M	N/a	A
	VMC approach	A/H/M	A/M	N/a	A
	Visual approach	A/H/M	A/M	N/a	A
	Communication failure procedures	A/H/M	A/M	N/a	A
	Interpretation of information provided on Standard Terminal Arrival Routes (STAR) and Standard Instrument Departures (SID) as published in the AIP	A/H	A	N/a	A
	AERODROME CHARTS	PPL	CPL	IR	ATPL
	Interpretation of information provided on aerodrome charts as published in the AIP	A/H/M	A/H/M	N/a	A
	NAVIGATION CHARTS	PPL	CPL	IR	ATPL
	World Aeronautical Charts	A/H	A	N/a	A
	Aerodrome Route facility chart	A/H	A	N/a	A
	Area charts	A/H	A	N/a	A

6.4	AERONAUTICAL INFORMATION CIRCULARS	PPL	CPL	IR	ATPL
	AIC 21.28 – Flying at unmanned aerodromes	A/H/M	A/H/M	N/a	A
	AIC 40.1 – Airspace Designation	A/H	A/H	N/a	A
	AIC 42.1 – Filing of flight plans and wake turbulence categories	A/H	A/H/M	N/a	A

6.5	ICAO ANNEX 14 – AERODROMES	PPL	CPL	IR	ATPL
	Definitions				
	Runway and Taxiway Markings	A/H/M	A/M	N/a	A
	Runway designation marking	A/H/M	A/M	N/a	A
	Runway centre line marking	A/H/M	A/M	N/a	A
	Threshold marking	A/H/M	A/M	N/a	A
	Displaced threshold marking	A/H/M	A/M	N/a	A
	Touchdown zone markings	A/H/M	A/M	N/a	A
	Runway side stripe marking	A/M	A/M	N/a	A
	Taxiway centre line marking	A/M	A/M	N/a	A
	Taxi-holding position markings	A/M	A/M	N/a	A
	Angle of Approach and Runway lighting System	A/M	A/M	N/a	A
	PAPI and APAPI	A/M	A/M	N/a	A
	Runway threshold identification light	A/M	A/M	N/a	A
	Runway edge lights	A/M	A/M	N/a	A
	Runway threshold and wing bar lights	A/M	A/M	N/a	A
	Runway end lights and stopway lights	A/M	A/M	N/a	A
	Runway centre line lights	A/M	A/M	N/a	A
	Runway touchdown lights	A/M	A/M	N/a	A
	Taxiway centre line lights	A/M	A/M	N/a	A
	Declared Distances	A/M	A/M	N/a	A
	Runway length	A/M	A/M	N/a	A
	Landing distance available (LDA)	A/M	A/M	N/a	A
	Clearways and stopways	A/M	A/M	N/a	A
	Accelerated-stop distance available (ASDA)	A/M	A/M	N/a	A
	Take-off run available (TORA)	A/M	A/M	N/a	A
	Take-off distance available (TODA)	A/M	A/M	N/a	A

6.6	AERODROME OPERATING MINIMA	PPL	CPL	IR	ATPL
	MOZ-CAR				
	91.06.31 – Minimum heights	A/H/M	A/H/M	N/a	A
	91.97.1 – Minimum flight altitudes	A/H/M	A/H/M	N/a	A
	91.07.5 – Aerodrome operating minima	A/H/M	A/H/M	N/a	A
	91.07.7 – Pre-flight selection of aerodromes	A/H/M	A/H/M	N/a	A
	91.07.8 – Planning minima for IFR flights		A/H/M	N/a	A
	91.07.9 – Meteorological conditions	A/H/M	A/H/M	N/a	A
	91.07.24 – Approach and landing conditions	A/H/M	A/H/M	N/a	A
	91.07.25 – Commencement and continuation of approach	A/H/M	A/H/M	N/a	A
	91.08.1 – Aerodrome operating minima: low-visibility	N/a	A/H	N/a	A
	91.08.2 – General operating minima for low-visibility operations	N/a	A/H	N/a	A

6.6	AERODROME OPERATING MINIMA	PPL	CPL	IR	ATPL
	91.08.3 – Aerodrome considerations for low visibility operations	N/a	A/H	N/a	A
	91.08.5 – Operating procedures for low-visibility operations	N/a	A/H	N/a	A
	91.08.6 – Minimum equipment for low-visibility operations	N/a	A	N/a	A
	121.07.7 – Aerodrome operating minima: Flight Operations	N/a		N/a	A
	127.07.7 – Heliport operating minima: Flight Operations	N/a	H	N/a	H
	135.07.7 – Aerodrome operating minima: Flight Operations	N/a	H	N/a	A
	Civil Aviation Technical Standards (CATS)	A/H	H	N/a	A
	TS 91.07.8 – Planning minima for destination and alternate aerodromes	A/H	H	N/a	A
	TS 135.07.7	A/H	A/H	N/a	A
	Take-off minima	A/H	A/H	N/a	A
	Non-precision approach	N/a	A/H	N/a	A
	Precision approach – CAT I Operation	N/a	A	X	A
	Precision approach – CAT II Operation	N/a	A	X	A
	Precision approach – CAT III Operation	N/a	A	X	A
	Circling	N/a	A	N/a	A
	Visual approach	A/H	A/H	N/a	A
	Conversion of reported meteorological visibility to RVR	N/a	N/a	N/a	A
	Recommended study references:	PPL	CPL	IR	ATPL
	ICAO Document 8168 Volume 1	A/H	A/H	N/a	A
	ICAO Annex 14	A/H	A/H	N/a	A
	Mozambique AIP and AIC	A/H	A/H	N/a	A
	World Aeronautical Chart	A/H	A/H	N/a	A
	Aerod Route Facility Chart	A/H	A/H	N/a	A
	Aerod Area Chart	A/H	A/H	N/a	A
	Symbol and legends relating to the above charts	A/H	A/H	N/a	A

7. INSTRUMENTS AND ELECTRONICS (INSTRUMENTS, MAGNETISM AND COMPASSES)

7.1	AIR DATA INSTRUMENTS	PPL	CPL	IR	ATPL
	Pitot / Static system	A/H/M	A/H/M	X	A / H
	Pitot tube	A/H/M	A/H/M	X	A / H
	Construction	A/H/M	A/H/M	X	A / H
	Principle of operation	A/H/M	A/H/M	X	A / H
	Heating	A/H/M	A/H/M	X	A / H
	Static source	A/H/M	A/H/M	X	A / H
	Malfunction	A/H/M	A/H/M	X	A / H
	Heating	A/H/M	A/H/M	X	A / H
	Alternate static source	A/H/M	A/H/M	X	A / H
	Air Data Computer (ADC)	N/a	A / H	X	A / H
	Principle of operation	N/a	A / H	X	A / H
	Input and output data, signals	N/a	A / H	X	A / H
	Uses of output data	N/a	A / H	X	A / H
	Airspeed indicator	A/H/M	A/H/M	X	A / H
	Construction and calibration	A/H/M	A/H/M	X	A / H
	Principle of operation	A/H/M	A/H/M	X	A / H
	Airspeed indications	A/H/M	A/H/M	X	A / H
	Meaning of coloured arcs	A/H	A / H	X	A / H
	Maximum speed indicators	A/H	A / H	X	A / H
	Errors, blockages and leaks	N/a	A / H	X	A / H
	Calculations	N/a	A / H	X	A / H
	Mach meter	N/a	A	X	A / H
	Mach number formula	N/a	A	X	A / H
	Construction and calibration	N/a	A	X	A / H
	Principle of operation	N/a	A	X	A / H
	Errors, blockages and leaks	N/a	A	X	A / H
	Calculations	N/a	A	X	A / H
	Altimeter	A/H/M	A/H/M	X	A / H
	Simple altimeter	A/H/M	A/H/M	X	A / H
	Sensitive altimeter	A/H/M	A/H/M	X	A / H
	Servo-assisted altimeter	A/H	A / H	X	A / H
	Construction and calibration	A/H	A / H	X	A/H
	Errors	A/H/M	A/H/M	X	A / H
	Tolerances	A/H/M	A/H/M	X	A / H
	Altitude alert	A/H/M	A/H/M	X	A / H
	Encoding altimeters	A/H	A / H	X	A / H
	Altimeter settings, QNH, QFE, QNE	A/H	A / H	X	A / H
	Pressure, true, absolute altitude	A/H	A / H	X	A / H
	Calculations	N/a	A / H	X	A / H
	Vertical Speed Indicator (VSI)	A/H	A / H	X	A / H
	Aneroid and instantaneous (IVSI)	A/H	A / H	X	A / H
	Construction	A/H	A / H	X	A / H
	Principle of operation	A/H	A / H	X	A / H
	Errors	A/H	A / H	X	A / H

7.2	GYROSCOPIC INSTRUMENTS	PPL	CPL	IR	ATPL
	Gyro fundamentals	N/a	A / H	X	A / H
	Theory of gyroscopic forces	N/a	A / H	X	A / H
	Types, construction and principles of operation	N/a	A / H	X	A / H
	Vertical gyro	N/a	A / H	X	A / H
	Tied gyro	N/a	A / H	X	A / H
	Rate gyro	N/a	A / H	X	A / H
	Rate integration gyro	N/a	A / H	X	A / H
	Single degree of freedom gyro	N/a	A / H	X	A / H
	Ring laser gyro	N/a	A / H	X	A / H
	Apparent drift / wander	N/a	A / H	X	A / H
	Random / real drifter/ wander	N/a	A / H	X	A / H
	Mountings, gimbals	N/a	A / H	X	A / H
	Drive types, monitoring	N/a	A / H	X	A / H
	Directional gyro (DG)	N/a	A / H	X	A / H
	Construction	N/a	A / H	X	A / H
	Principle of operation	N/a	A / H	X	A / H
	Limitations	N/a	A / H	X	A / H
	Drift calculations	N/a	A / H	X	A / H
	Artificial Horizon (vertical gyro)	N/a	A / H	X	A / H
	Construction	N/a	A / H	X	A / H
	Principle of operation	N/a	A / H	X	A/H
	Turn and acceleration errors	N/a	A / H	X	A / H
	Standby altitude indicator	N/a	A / H	X	A / H
	Turn and Slip Indicator (rate gyro)	N/a	A / H	X	A / H
	Construction	N/a	A / H	X	A / H
	Principles of operation	N/a	A / H	X	A / H
	Errors	N/a	A / H	X	A / H
	Turn co-ordinator	N/a	A / H	X	A / H
	Rate of turn	N/a	A / H	X	A / H
	Angle of bank	N/a	A / H	X	A / H
	Radius of turn	N/a	A / H	X	A / H
	Calculations	N/a	A / H	X	A / H

7.3	INERTIAL NAVIGATION SYSTEM (INS)	PPL	CPL	IR	ATPL
	Principles and practical application	N/a	A/H	X	A / H
	Gyroscopic principles	N/a	A/H	X	A / H
	Platform mounting	N/a	A/H	X	A / H
	Accelerometer principles	N/a	A/H	X	A / H
	Integrator principles	N/a	A/H	X	A / H
	Shuler tuned platform	N/a	A/H	X	A / H
	Navigation computer	N/a	A/H	X	A / H
	Strap-down systems	N/a	A/H	X	A / H
	Ring laser gyro	N/a	A/H	X	A / H
	Alignment procedures	N/a	A/H	X	A / H
	Gyro compassing	N/a	A/H	X	A / H
	Levelling	N/a	A/H	X	A / H
	Accuracy, errors	N/a	A/H	X	A / H
	Flight deck equipment and operation	N/a	A/H	X	A / H
	Mode selector unit (HSU)	N/a	A/H	X	A / H
	Control display unit (CDU)	N/a	A/H	X	A / H

7.3	INERTIAL NAVIGATION SYSTEM (INS)	PPL	CPL	IR	ATPL
	Horizontal situation unit (HSU)	N/a	A/H	X	A / H
	INS operation	N/a	A/H	X	A / H
	Normal flight, position and waypoint entries	N/a	A/H	X	A / H
	Flight plan changes	N/a	A/H	X	A / H
	Bypassing waypoint	N/a	A/H	X	A / H
	Change of waypoint data	N/a	A/H	X	A / H
	System check and updating	N/a	A/H	X	A / H
	Angle of Attack Indicator	N/a	A/H	X	A / H
	Principle of operation	N/a	A/H	X	A / H
	Sensors	N/a	A/H	X	A / H
	Indicators	N/a	A/H	X	A / H
	Flight Data Recorders	A/H	H	X	A / H
	General Principles, function, operation	A/H	H	X	A / H
	Air Temperature Indicators	N/a	H	X	A / H
	Type or sensors	N/a	H	X	A / H
	Method of sensors	N/a	H	X	A / H
	Method of operation	N/a	H	X	A / H
	SAT, RAT, TAT, recovery factor	N/a	H	X	A / H
	Flight Director Systems	A/H	A/H	X	A / H
	General principles	A/H	A/H	XX	A / H
	Method of operation	N/a	A/H	X	A / H
	Flight Management System (FMS)	N/a	A/H	X	A / H
	General principles	N/a	A/H	X	A / H
	Method of operation	N/a	A/H	X	A / H
	Electronic Flight Instrument System (EFIS)	A/H	A/H	X	A / H
	Principle of operation	A/H	A/H	X	A / H
	Information display types	N/a	A/H	X	A / H
	Data input	N/a	A/H	X	A / H
	Control panel, display unit	N/a	A/H	X	A / H
	Examples of typical installation	N/a	A/H	X	A / H
	Autopilot	N/a	A/H	XX	A / H
	General principles	N/a	A/H	X	A / H

7.4	MAGNETISM	PPL	CPL	IR	ATPL
	Terrestrial Magnetism	A/H/M	A/H/M	X	A / H
	Resolution of the earth's total magnetic field into horizontal and vertical components	A/H/M	A/H/M	X	A / H
	Directive force, isodynes	A/H/M	A/H/M	X	A / H
	Magnetic dip, isoclinals	A/H/M	A/H/M	X	A / H
	Variation, isogonals, agonic line	A/H/M	A/H/M	X	A / H
	Secular change in variation	A/H	A / H	X	A / H
	Aircraft Magnetism	A/H	A / H	X	A / H
	Horizontal Hard Iron (HHI)	N/a	A / H	X	A / H
	Components P and Q	N/a	A / H	X	A / H
	Vertical Soft Iron (VSI)	N/a	A	X	A / H
	Components cZ and fZ	N/a	A	X	A / H
	Compass swing	A/H/M	A/H/M	X	A / H
	Calculation of coefficient A, B and C	N/a	A / H	X	A / H
	Correction of Coefficient A, B and C	N/a	A / H	X	A / H
	Deviation on any heading	A/H/M	A/H/M	X	A / H
	Headings of zero and maximum deviation	A/H	A	X	A / H
	Change of deviation with change of latitude	A/H	A / H	X	A / H

7.5	COMPASSES	PPL	CPL	IR	ATPL
	Direct reading magnetic compass	A/H	A / H	X	A / H
	Micro-adjuster	A/H	A / H	X	A / H
	Serviceability tests	A/H	A / H	X	A / H
	Detailed knowledge of the above	N/a	A / H	X	A / H
	Remote indicating compasses	A/H	A / H	X	A / H
	Sperry CL2	N/a	A / H	X	A / H
	Principle	N/a	A / H	X	A / H
	Construction	N/a	A / H	X	A / H
	Operation	N/a	A / H	X	A / H
	Correction of Coefficient A, B and C	N/a	N/a	X	A / H
	Landing compass	N/a	N/a	X	A / H

8. AIRCRAFT TECHNICAL GENERAL

8.1	PRINCIPLES OF FLIGHT	PPL	CPL	IR	ATPL
	Application of Elements of Physics relating to aerodynamics	A/H/M	A/H/M	N/a	A / H
	Review of units of measurement	A/H/M	A/H/M	N/a	A / H
	Mass, weight, force, resolution and composition of forces, speed, acceleration inertia, momentum, motion on a curved track, work, power, energy, pressure, air density, moments and couples, velocity, temperature	A/H/M	A/H/M	N/a	A / H
	Derivation of Lift	A/H/M	A/H/M	N/a	A / H
	Equation of continuity	A/H/M	A/H/M	N/a	A / H
	Bernoulli's theorem	A/H/M	A/H/M	N/a	A / H
	Streamline flow	A/H/M	A/H/M	N/a	A / H
	Angle of attack	A/H/M	A/H/M	N/a	A / H
	Pressure distribution about a wing (transverse and longitudinal)	N/a	N/a	N/a	A / H
	Centre of pressure	A/H/M	N/a	N/a	A / H
	Wing shape (plan and section) and its effects on lift	N/a	N/a	N/a	A / H
	Lift formula	A/H/M	A/H/M	N/a	A / H
	Lift / drag ration	A/H/M	A/H/M	N/a	A / H
	Drag	A/H/M	A/H/M	N/a	A / H
	Profile drag	A/H/M	A/H/M	N/a	A / H
	Causes	A/H/M	A/H/M	N/a	A / H
	Variation with speed	A/H/M	A/H/M	N/a	A / H
	Methods of minimising	A/H/M	A/H/M	N/a	A / H
	Induced drag	A/H	A/H	N/a	A / H
	Causes	A/H	A/H	N/a	A / H
	Vortices	A/H	A/H	N/a	A / H
	Variation with speed	A/H	A/H	N/a	A / H
	Design factors affecting	N/a	A/H	N/a	A / H
	Total effect of the combination of profile and induced drag	N/a	A/H	N/a	A / H
	Distribution of forces – balance of couples	N/a	A	N/a	A / H
	Lift / mass and thrust / drag couples	N/a	A	N/a	A / H
	Necessity of achieving balance	A/H/M	A/H/M	N/a	A / H
	Methods of achieving balance	A/H/M	A/H/M	N/a	A / H

8.1	PRINCIPLES OF FLIGHT	PPL	CPL	IR	ATPL
	Stability	A/H/M	A/H/M	N/a	A / H
	Axes and planes of rotation	A/H/M	A/H/M	N/a	A / H
	Static stability	A/H/M	A/H/M	N/a	A / H
	Dynamic Stability	A/H/M	A/H/M	N/a	A / H
	Effects of design features on stability	A/H/M	A/H/M	N/a	A / H
	Interaction between stability in different planes	A/H	A/H	N/a	A / H
	Effect of altitude / speed on stability	N/a	A	N/a	A / H
	Roll and yaw dampers	N/a	A	N/a	A / H
	Stalling	N/a	A/H	N/a	A / H
	Angle of attack	A/H/M	A/H/M	N/a	A / H
	Boundary layer and causes of stalling	A/H/M	A/H/M	N/a	A / H
	Variation of lift and drag in the stall	A/H	A/H	N/a	A / H
	Movement of the centre of pressure	A/H	A/H	N/a	A / H
	Tip stalling, its dangers and methods of minimising	A/H	A/H	N/a	A / H
	The spin (autorotation)	A/H	A/H	N/a	A / H
	Symptoms of the stall	A/H	A/H	N/a	A / H
	Stall warning devices	A/H	A/H	N/a	A / H
	Stall recovery	A/H	A/H	N/a	A / H
	Effects of turbulent flow over tail surfaces on stall recovery	N/a	A	N/a	A / H
	Stick pushers / shakers	N/a	A	N/a	A / H
	Enhanced stalling speed in manoeuvre	N/a	A	N/a	A / H
	Lift augmentation	A/H	A/H	N/a	A / H
	Flaps	N/a	A	N/a	A / H
	Leading and trailing edge	N/a	A	N/a	A / H
	Effects of	N/a	A/H	N/a	A / H
	Advantages and disadvantages	A/H	A/H	N/a	A / H
	Slots and slats	N/a	A	N/a	A / H
	Effects of	N/a	A	N/a	A / H
	Advantages and disadvantages	N/a	A	N/a	A / H
	Effects of lift augmentation devices on lift / drag ratio	N/a	A	N/a	A / H
	Flying controls	A/H/M	A/H/M	N/a	A / H
	Ailerons, elevators, rudders, spoilers	A/H/M	A/H/M	N/a	A / H
	Primary effects of	A/H/M	A/H/M	N/a	A / H
	Secondary effects	A/H/M	A/H/M	N/a	A / H
	Balancing of controls	A/H/M	A/H/M	N/a	A / H
	Aerodynamic balance	A/H/M	A/H/M	N/a	A / H
	Mass balance	A/H/M	A/H/M	N/a	A / H
	Powered controls	N/a	A/H	N/a	A / H
	Methods of transmitting demands to control surfaces	N/a	A/H	N/a	A / H
	Feedback of control surface displacement (fee)	N/a	A/H	N/a	A / H
	Trim (including variable incidence tailplane)	N/a	A	N/a	A / H

8.2	PERFORMANCE (factors affecting)	PPL	CPL	IR	ATPL
	Take-off and Climb	A/H/M	A/H/M	N/a	A / H
	Level flight	A/H/M	A/H/M	N/a	A / H
	Maximum range	A/H/M	A/H/M	N/a	A / H
	Maximum endurance	A/H/M	A/H/M	N/a	A / H
	Descending, Approach and landing gliding	A/H/M	A/H/M	N/a	A / H
	Landing techniques	A/H/M	A/H/M	N/a	A / H
	Considerations factors affecting	A/H/M	A/H/M	N/a	A / H
	Turning, manoeuvre	A/H/M	A/H/M	N/a	A / H
	High speed flight	N/a	A/H	N/a	A / H
	Speed of sound, compressibility of air, airflow distribution and pressure wave formation, detached and attached shock waves, mach line, separation	N/a	A/H	N/a	A / H
	Aerofoils in compressible flows, boundary conditions, subsonic, transonic and supersonic flow patterns	N/a	A/H	N/a	A / H
	Wings and wing-fuselage combinations in compressible flow, influence of sweep-back, change of aspect ratio	N/a	A/H	N/a	A / H
	Variable incidence tailplane, large CG range, large speed range and large trim range, trim drag. Dutch roll, yaw and yaw dampers. Spiral stability, direction and lateral trim, high lift devices. Powered controls and artificial feel, stick pushers	N/a	A/H	N/a	A / H
	Free stream-mach number, local Mach number, critical Mach number, use of the Mach metre, shock stall – behaviour of aeroplane, effects of increasing Mach number, coefficient of lift and drag at transonic speed	N/a	A/H	X	A / H

8.3	AIRCRAFT ELEMENTS	PPL	CPL	IR	ATPL
	Valves	A/H/M	A/H/M	N/a	A
	Check valves	A/H/M	A/H/M	N/a	A
	Pressure release valves	A/H/M	A/H/M	N/a	A
	Selector valves	A/H/M	A/H/M	N/a	A
	Restrictors	N/a	A/H	N/a	A
	Thermal relief valves	N/a	A/H	N/a	A
	Bearings	A/H/M	A/H/M	N/a	A
	Plain bearings, split bearings an bushes	A/H/M	A/H/M	N/a	A
	Ball and roller bearings	A/H/M	A/H/M	N/a	A
	Pumps	A/H/M	A/H/M	N/a	A
	Gear type	A/H/M	A/H/M	N/a	A
	Diaphragm type	A/H/M	A/H/M	N/a	A
	Vane type	A/H/M	A/H/M	N/a	A
	Piston type	A/H/M	A/H/M	N/a	A
	Wobble type	A/H/M	A/H/M	N/a	A
	Centrifugal	A/H/M	A/H/M	N/a	
	Pump drives	A/H/M	A/H/M	N/a	A
	Filters	A/H/M	A/H/M	N/a	A

8.3	AIRCRAFT ELEMENTS	PPL	CPL	IR	ATPL
	Strainers	A/H/M	A/H/M	N/a	A
	Sediment traps	A/H/M	A/H/M	N/a	A

8.4	AIRFRAME AND SYSTEMS (AEROPLANES)	PPL	CPL	IR	ATPL
	Fuselage	A	A	N/a	A
	Types of construction	A	A	N/a	A
	Structural components and materials	A	A	N/a	A
	Cockpit and cabin windows	A	A	N/a	A
	Construction (laminated glass)	A	A	N/a	A
	Structural limitations	A	A	N/a	A
	Window heating	A	A	N/a	A
	Aerofoils	A	A	N/a	A
	Types of construction	A	A	N/a	A
	Structural components and materials	A	A	N/a	A
	Control surfaces	A	A	N/a	A
	Vertical, horizontal and V tail surfaces	A	A	N/a	A
	Landing gear	A	A	N/a	A
	Types	A	A	N/a	A
	Construction	A	A	N/a	A
	Locking devices	A	A	N/a	A
	Emergency extension systems	A	A	N/a	A
	Accidental retraction prevention systems	A	A	N/a	A
	Position, movement lights and indicators	A	A	N/a	A
	Nose wheel steering	A	A	N/a	A
	Wheels and tyres (construction, limitations)	A	A	N/a	A
	Braking systems	A	A	N/a	A
	Construction	A	A	N/a	A
	Parking brake	A	A	N/a	A
	Operation of anti-skid system	A	A	N/a	A
	Operation of auto-brake system	A	A	N/a	A
	Operation, indications and warning systems	A	A	N/a	A
	Limitations and precautions	A	A	N/a	A
	Flight controls	A	A	N/a	A
	Primary controls	A	A	N/a	A
	Elevator, aileron, wing spoilers, rudder	A	A	N/a	A
	Trim	A	A	N/a	A
	Mode of actuation	A	A	N/a	A
	Operation, indicators	A	A	N/a	A
	Warning devices and controls	A	A	N/a	A
	Secondary controls lift augmentation and wing flaps	A	A	N/a	A
	Lift dumping and speed brakes	A	A	N/a	A
	Variable elevator	A	A	N/a	A
	Mode of operation (mechanical, hydraulic, fly by wire)	A	A	N/a	A
	Operation, indicators, warning devices	A	A	N/a	A
					A
	Hydraulics	A	A	N/a	A
	Basic principals of hydromechanics	A	A	N/a	A
	Hydraulic fluids	A	A	N/a	A
	Schematic construction and functioning of hydraulic systems	A	A	N/a	A

8.4	AIRFRAME AND SYSTEMS (AEROPLANES)	PPL	CPL	IR	ATPL
	Hydraulic systems	A	A	N/a	A
	Main, stand-by and emergency systems	A	A	N/a	A
	accumulators	A	A	N/a	A
	reservoirs	A	A	N/a	A
	Operation, indicators, warning systems	A	A	N/a	A
	Ancillary systems	A	A	N/a	
	Air driven systems – piston engine aircraft	A	A	N/a	A
	Pneumatic systems	A	A	N/a	A
	Power sources	A	A	N/a	A
	Schematic construction and functioning of pneumatic systems	A	A	N/a	A
	De-ice systems	A	A	N/a	A
	Pneumatic leading edge de-icing of wings and control surfaces	A	A	N/a	A
	Schematic construction	A	A	N/a	A
	Operational limitations	A	A	N/a	A
	Initiation / timing of de-icing system usage	A	A	N/a	A
	Air driven systems – Turbo propeller and Jet aircraft	N/a	A	N/a	A
	Pneumatic system	N/a	A	N/a	A
	Power sources	N/a	A	N/a	A
	Schematic construction	N/a	A	N/a	A
	Potential failures, safety devices	N/a	A	N/a	A
	Operation, indicators, warning systems	N/a	A	N/a	A
	Pneumatic operated systems	N/a	A	N/a	A
	Anti-ice systems	N/a	A	N/a	A
	Airfoil and control surfaces, power plant, air intakes, windshield	N/a	A	N/a	A
	Schematic construction, operating limitations and initiation	N/a	A	N/a	A
	Timing of de-ice wing system	N/a	A	N/a	A
	Ice warning systems	N/a	A	N/a	A
	Non-pneumatic operated de-ice and anti-ice systems	N/a	A	N/a	A
	Schematic construction, functioning and operation of	N/a	A	N/a	A
	Air intake	N/a	A	N/a	A
	propeller	N/a	A	N/a	A
	Pitot static pressure sensor and stall warning devices	N/a	A	N/a	A
	windshield	N/a	A	N/a	A
	Weeping anti-ice wing systems	N/a	A	N/a	A
	Rain repellent system	N/a	A	N/a	A
	Pressurisation	A	A	N/a	A
	Cabin altitude, maximum cabin altitude	A	A	N/a	A
	Differential pressure	A	A	N/a	A
	Operation and indicators	A	A	N/a	A
	Safety devices and warning systems	A	A	N/a	A
	Rapid decompression, cabin altitude warning	A	A	N/a	A
	Emergency procedures	A	A	N/a	A
	Air conditioning systems	A	A	N/a	A
	Construction, functioning, operation	A	A	N/a	A

8.4	AIRFRAME AND SYSTEMS (AEROPLANES)	PPL	CPL	IR	ATPL
	Indicators and warning devices	A	A	N/a	A
	Heating and cooling	A	A	N/a	A
	Temperature regulation	A	A	N/a	A
	Automatic and manual	A	A	N/a	A
	Ram air ventilation	A	A	N/a	A
	Fuel system	A	A	N/a	A
	Fuel tanks	A	A	N/a	A
	Structural components and types	A	A	N/a	A
	Location of tanks on single and multi-engine aircraft	A	A	N/a	A
	Sequence and type of refuelling	A	A	N/a	A
	Unusable fuel	A	A	N/a	A
	Fuel feed	A	A	N/a	A
	Gravity and pressure feed	A	A	N/a	A
	Cross feed	A	A	N/a	A
	Schematic construction	A	A	N/a	A
	Fuel dumping system	A	A	N/a	A
	Fuel system monitoring	A	A	N/a	
	Operation, indicators, warning systems	A	A	N/a	A
	Fuel management (sequencing of fuel tank switching)	A	A	N/a	A
	dipstick	A	A	N/a	A
	Electrics – direct current (DC)	A	A	N/a	A
	General	A	A	N/a	A
	Electric circuits	A	A	N/a	A
	Voltage, current, resistance	A	A	N/a	A
	Ohm's law	A	A	N/a	A
	Resistive circuits	A	A	N/a	A
	Resistance as a function of temperature	A	A	N/a	A
	Electrical power, electrical work	A	A	N/a	A
	Fuses (function, type and operation)	A	A	N/a	A
	The electrical field	A	A	N/a	A
	The capacitor (function)	A	A	N/a	A
	Batteries	A	A	N/a	A
	Theory, types, characteristics	A	A	N/a	A
	Capacity	A	A	N/a	A
	Uses, servicing	A	A	N/a	A
	Hazards	A	A	N/a	A
	Magnetism	A	A	N/a	A
	Permanent magnetism	A	A	N/a	A
	electromagnetism	N/a	A	N/a	A
	Relay, circuit breaker, solenoid valve (principle, function and application)	N/a	A	N/a	A
	Electromagnetic power	N/a	A	N/a	A
	Electromagnetic induction	N/a	A	N/a	A
	Generators / Alternators	A	A	N/a	A
	Principle, function and application	A	A	N/a	A
	Monitoring devices	A	A	N/a	A
	Regulation, control and Protection	A	A	N/a	A
	Modes of excitation	A	A	N/a	A
	Starter generator	A	A	N/a	A
	Distribution	A	A	N/a	A

8.4	AIRFRAME AND SYSTEMS (AEROPLANES)	PPL	CPL	IR	ATPL
	Current distribution	A	A	N/a	A
	Buses	A	A	N/a	A
	Monitoring of electrical flight instrument / systems	A	A	N/a	A
	Ammeter, voltmeter	A	A	N/a	A
	Annunciators	A	A	N/a	A
	Electric consumers	A	A	N/a	A
	DC power distribution	A	A	N/a	A
	Construction, operation and system monitoring	A	A	N/a	A
	Elementary switching circuits	A	A	N/a	A
	Inverter (application)	A	A	N/a	A
	The aircraft structure as an electrical conductor	A	A	N/a	A
	Electric – alternating current (AC)	A	A	N/a	A
	General	A	A	N/a	A
	Single and multi-phase AC	A	A	N/a	A
	Frequency	A	A	N/a	A
	Phase shift	A	A	N/a	A
	AC components	A	A	N/a	A
	Alternator / Generator	A	A	N/a	A
	3 phase	A	A	N/a	A
	Brushless (construction and operation)	A	A	N/a	A
	Drive	A	A	N/a	A
	Constant speed drive	A	A	N/a	A
	Integrated drive	A	A	N/a	A
	AC power distribution	A	A	N/a	A
	Construction, operation and monitoring	A	A	N/a	A
	Protection circuits, paralleling of AC generators	A	A	N/a	A
	Transformers and inverters	A	A	N/a	A
	Function	A	A	N/a	A
	Types and application	A	A	N/a	A
	Synchronous and asynchronous motors	A	A	N/a	A
	Operation	A	A	N/a	A
	Application	A	A	N/a	A
	Transformer / rectifier units	A	A	N/a	A
	Semiconductors	A	A	N/a	A
	Principles of semiconductors	A	A	N/a	A
	Semiconductors resistors (properties and application)	A	A	N/a	A
	Rectifier (function and application)	A	A	N/a	A
	Transistor (function and application)	A	A	N/a	A
	Diode (function and application)	A	A	N/a	A
	Basic knowledge of computers	A	A	N/a	A
	Logic circuits	A	A	N/a	A
	Logic symbols	A	A	N/a	A
	Switching circuits and logical symbols	A	A	N/a	A
	Basic radio propagation theory	A	A	N/a	A
	Basic principles	A	A	N/a	A
	Electromagnetic waves	A	A	N/a	A
	Wavelength, amplitude, phase angle, frequency, frequency bands, sidebands, single sidebands	A	A	N/a	A
	Pulse characteristics	A	A	N/a	A

8.4	AIRFRAME AND SYSTEMS (AEROPLANES)	PPL	CPL	IR	ATPL
	Carrier, modulation and demodulation	A	A	N/a	A
	Kinds of modulation (amplitude, frequency, pulse, multiplex) and	A	A	N/a	A
	Oscillation circuits	A	A	N/a	A
	Antennas	A	A	N/a	A
	Characteristics	A	A	N/a	A
	Polarisation; and	A	A	N/a	A
	Types of antennas	A	A	N/a	A
	Wave propagation	A	A	N/a	A
	Ground waves	A	A	N/a	A
	Space waves	A	A	N/a	A
	Propagation with the frequency bands;	A	A	N/a	A
	Frequency prognosis (MUF)	A	A	N/a	A
	Fading; and	A	A	N/a	A
	Factors affecting propagation (reflection, absorption, interference, twilight, shoreline, mountain and static	A	A	N/a	A

8.5	AIRFRAME AND SYSTEMS – HELICOPTERS	PPL	CPL	IR	ATPL
	Airframe and systems, electrics, powerplant and emergency equipment	H	H	N/a	H
	Airframe and systems	H	H	N/a	H
	Fuselage	H	H	N/a	H
	Types of construction; and	H	H	N/a	H
	Structural components and materials	H	H	N/a	H
	Cockpit and cabin windows	H	H	N/a	H
	Construction (laminated glass); and	H	H	N/a	H
	Structural limitations	H	H	N/a	H
	Aerofoil	H	H	N/a	H
	Rotor blades	H	H	N/a	H
	Types of construction;	H	H	N/a	H
	Properties of different aerofoil sections; and	H	H	N/a	H
	Rotor balance, static and dynamic	H	H	N/a	H
	Control surfaces	H	H	N/a	H
	Vertical and horizontal stabilisers	H	H	N/a	H
	Landing gear	H	H	N/a	H
	Types	H	H	N/a	H
	Skid landing gear	H	H	N/a	H
	Floatation gear	H	H	N/a	H
	Floatation emergency gear	H	H	N/a	H
	Construction	H	H	N/a	H
	Locking devices and emergency extension systems	H	H	N/a	H
	Accidental retraction prevention devices	H	H	N/a	H
	Position, movement lights and indicators	H	H	N/a	H
	Nose wheel steering	H	H	N/a	H
	Wheels and tyres (construction and limitations);	H	H	N/a	H
	Braking systems	H	H	N/a	H
	Construction;	H	H	N/a	H
	Parking brake	H	H	N/a	H
	Method of operation of anti-skid system	H	H	N/a	H
	Method of operation of auto brake system and	H	H	N/a	H

Operation, indication and warning systems	H	H	N/a	H
Flight controls (construction and operation)	H	H	N/a	H
Flight controls	H	H	N/a	H
Collective pitch control;	H	H	N/a	H
Throttle / fuel control;	H	H	N/a	H
Cyclic pitch control;	H	H	N/a	H
Mixing unit;	H	H	N/a	H
Yaw pedals;	H	H	N/a	H
Power assisted flight controls	H	H	N/a	H
Swash plate assembly	H	H	N/a	H
Rotating star	H	H	N/a	H
Non-rotating star	H	H	N/a	H
Main rotor head system	H	H	N/a	H
Fully articulated system	H	H	N/a	H
Semi-rigid rotor system; and	H	H	N/a	H
Rigid rotor systems	H	H	N/a	H
Dynamic transmission system	H	H	N/a	H
Main gear box	H	H	N/a	H
Intermediate gear box	H	H	N/a	H
Tail rotor gear box	H	H	N/a	H
Freewheel unit	H	H	N/a	H
Clutch unit	H	H	N/a	H
Engine to main gear box coupling, and	H	H	N/a	H
Rotor brake system	H	H	N/a	H
Hydraulics	H	H	N/a	H
Basic principles of hydromechanics	H	H	N/a	H
Hydraulic fluids; and	H	H	N/a	H
Schematic construction and functioning of hydraulic systems	H	H	N/a	H
Hydraulic systems	H	H	N/a	H
Main, standby and emergency systems	H	H	N/a	H
Operation, indicators and warning systems, and	H	H	N/a	H
Ancillary systems	H	H	N/a	H
Air driven systems (piston engines only)	H	H	N/a	H
Pneumatic system	H	H	N/a	H
Power sources; and	H	H	N/a	H
Schematic construction and functioning of pneumatic systems	H	H	N/a	H
De-ice systems	N/a	H	N/a	H
Pneumatic leading edge de-icing of wings and control surfaces	N/a	H	N/a	H
Schematic construction;	N/a	H	N/a	H
Operational limitation; and	N/a	H	N/a	H
Initiation / timing of de-icing system usage	N/a	H	N/a	H
Air Driven Systems – Turbo-propeller and Jet aircraft	N/a	H	N/a	H
Pneumatic system	H	H	N/a	H
Power sources;	H	H	N/a	H
Schematic construction	H	H	N/a	H
Potential failures, warning and devices	H	H	N/a	H
Operation, indicators, warning systems and	H	H	N/a	H
Pneumatic operated systems	H	H	N/a	H
Air conditioning system	H	H	N/a	H

	Construction, functioning, operation, indicators and warning devices	H	H	N/a	H
	Heating and cooling	H	H	N/a	H
	Temperature regulation	H	H	N/a	H
	Automatic and manual; and	H	H	N/a	H
	Ram air ventilation	H	H	N/a	H
	Fuel system	H	H	N/a	H
	Fuel tanks	H	H	N/a	H
	Structural components and types;	H	H	N/a	H
	Location of tanks on single and multi-engine aircraft	H	H	N/a	H
	Sequence and type of refuelling; and	H	H	N/a	H
	Unusable fuel	H	H	N/a	H
	Fuel feed	H	H	N/a	H
	Gravity and pressure feed	H	H	N/a	H
	Cross feed; and	H	H	N/a	H
	Schematic construction	H	H	N/a	H
	Fuel dumping system	H	H	N/a	H
	Fuel system monitoring	H	H	N/a	H
	Operation, indicators, warning systems	H	H	N/a	H
	Fuel management (sequencing of fuel tank switching) and	H	H	N/a	H
	Dipstick	H	H	N/a	H

8.6	POWERPLANT – PISTON ENGINE	PPL	CPL	IR	ATPL
	Engine nomenclature	A/H/M	A/H/M	N/a	A/H
	Major parts and assemblies	A/H/M	A/H/M	N/a	A/H
	Cylinder arrangements	A/H/M	A/H/M	N/a	A/H
	Cylinder numbering	A/H/M	A/H/M	N/a	A/H
	Bore, stroke, engine displacement	A/H/M	A/H/M	N/a	A/H
	Swept volume	A/H/M	A/H/M	N/a	A/H
	Compression ratio	A/H/M	A/H/M	N/a	A/H
	Design type	A/H/M	A/H/M	N/a	A/H
	Principles of the 4-stroke internal combustion engine;	A/H/M	A/H/M	N/a	A/H
	Mechanical components	A/H/M	A/H/M	N/a	A/H
	Four stroke cycle	A/H/M	A/H/M	N/a	A/H
	Compression ignition, spark ignition, valve lead, lag and overlap, ignition timing	A/H/M	A/H/M	N/a	A/H
	Combustion process, factors necessary for efficient combustion, mixture ratios, temperatures	A/H/M	A/H/M	N/a	A/H
	Cylinder pressure in normal operating engine indicator / instruments	A/H/M	A/H/M	N/a	A/H
	Supercharging and turbo-supercharging	N/a	A/H	N/a	A/H
	Detonation	A/H	A/H	N/a	A/H
	Factors contributing to detonation	A/H	A/H	N/a	A/H
	Effects and indications	A/H	A/H	N/a	A/H
	Stopping and prevention	A/H	A/H	N/a	A/H
	Pre-ignition	A/H/M	A/H/M	N/a	A/H
	Factors contributing to pre-ignition	A/H/M	A/H/M	N/a	A/H
	Effects and indications	A/H/M	A/H/M	N/a	A/H
	Stopping and prevention	A/H/M	A/H/M	N/a	A/H

8.6	POWERPLANT – PISTON ENGINE	PPL	CPL	IR	ATPL
	Relationship between detonation and pre-ignition	A/H	A/H	N/a	A/H
	Cylinder construction	A/H	A/H	N/a	A/H
	Barrel, cylinder head, head valves, valve operating mechanism, valve timing, valve clearances	A/H	A/H	N/a	A/H
	Piston	A/H/M	A/H/M	N/a	A/H
	Piston rings, piston pin, connecting rods	A/H/M	A/H/M	N/a	A/H
	Crank shafts and camshaft gearing	A/H/M	A/H/M	N/a	A/H
	Dynamic dampers, bearings, camshafts	A/H/M	A/H/M	N/a	A/H
	Crankcase	A/H/M	A/H/M	N/a	A/H
	Construction, accessories, supercharger, breather systems	A/H/M	A/H/M	N/a	A/H
	Ignition system	A/H/M	A/H/M	N/a	A/H
	Battery (coil) ignition, HT magnetos, LT magnetos	A/H/M	A/H/M	N/a	A/H
	Ignition timing, single point and dual point ignition, flame pattern, staggered ignition	A/H/M	A/H/M	N/a	A/H
	Impulse coupling, booster coil, induction vibrator	A/H/M	A/H/M	N/a	A/H
	High energy ignition burners, electrical and battery power requirements	A/H/M	A/H/M	N/a	A/H
	Spark plugs, ignition harness, shielding	A/H/M	A/H/M	N/a	A/H
	Lubrication and Cooling	A/H/M	A/H/M	N/a	A/H
	Lubrication for reduction of friction and cooling, wet and dry sump system, lubrication method (splash, spray, pressure, mist) oil pressure pump, scavenge pump, oil pressure relief valve	A/H/M	A/H/M	N/a	A/H
	Lubrication system, lubrication of components, oil grades, oil cooling system, heat removal, temperature regulator, factors affecting viscosity of oil	A/H/M	A/H/M	N/a	A/H
	Air cooling, fins, importance of airflow ground handling, control of airflow	A/H/M	A/H/M	N/a	A/H
	System monitoring	A/H/M	A/H/M	N/a	A/H
	Cylinder head temperature;	A/H	A/H	N/a	A/H
	Cowl flaps	A/H	A/H	N/a	A/H
	Fuel carburation and fuel injection system	A/H	A/H	N/a	A/H
	Fuel	A/H	A/H	N/a	A/H
	Types, grades	A/H	A/H	N/a	A/H
	Detonation characteristics, octane rating	A/H	A/H	N/a	A/H
	Colour coding	A/H	A/H	N/a	A/H
	Additives	A/H	A/H	N/a	A/H
	Water content, ice formation	A/H	A/H	N/a	A/H
	Fuel density; and	A/H	A/H	N/a	A/H
	Alternate fuels, difference in specifications, limitations	A/H	A/H	N/a	A/H
	Mixture	A/H/M	A/H/M	N/a	A/H
	Rich and lean mixture; and	A/H/M	A/H/M	N/a	A/H
	Maximum power and fuel economy mixture	A/H/M	A/H/M	N/a	A/H
	setting	A/H/M	A/H/M	N/a	A/H

8.6	POWERPLANT – PISTON ENGINE	PPL	CPL	IR	ATPL
	Fuel injection system, swirl atomisation	A/H	A/H	N/a	A/H
	Fuel loss through evaporation and boiling	A/H	A/H	N/a	A/H
	Control of fuel flow, pressure control system	A/H	A/H	N/a	A/H
	Flow control systems barometric pressure control	A/H	A/H	N/a	A/H
	Air-fuel ratio control	A/H	A/H	N/a	A/H
	Priming system	A/H	A/H	N/a	A/H
	Priming pump	A/H	A/H	N/a	A/H
	Solenoid	A/H	A/H	N/a	A/H
	Injection point	A/H	A/H	N/a	A/H
	Icing	A/H	A/H	N/a	A/H
	Effect of ice on engine performance	A/H	A/H	N/a	A/H
	Physical principle of ice formation	N/a	A/H	N/a	A/H
	Prevention and removal of ice	A/H	A/H	N/a	A/H
	Carburettor heat	N/a	A/H	N/a	A/H
	Engine power	A/H/M	A/H/M	N/a	A/H
	Power measurements	A/H/M	A/H/M	N/a	A/H
	Indicated horse-power	A/H/M	A/H/M	N/a	A/H
	Development of formula	A/H/M	A/H/M	N/a	A/H
	Brake horse-power	A/H/M	A/H/M	N/a	A/H
	Torque measuring devices	N/a	A/H	N/a	A/H
	Calculation of power	N/a	A/H/M	N/a	A/H
	Determination of friction horse-power	N/a	A/H/M	N/a	A/H
	Engine efficiency	N/a	A/H/M	N/a	A/H
	Thermal, mechanical, volumetric	N/a	A/H/M	N/a	A/H
	Power augmentation devices	N/a	A/H	N/a	A/H
	Turbocharger, supercharger (construction and effect on engine performance)	N/a	A/H	N/a	A/H
	Propellers	A/H/M	A/H/M	N/a	A/H
	General theory	A/H/M	A/H/M	N/a	A/H
	Conversion of engine torque to thrust	A/H/M	A/H/M	N/a	A/H
	Meaning of Pitch	A/H/M	A/H/M	N/a	A/H
	Reasons for blade twist	A/H/M	A/H/M	N/a	A/H
	Reasons for variable pitch / constant speed	A/H/M	A/H/M	N/a	A/H
	Propeller efficiency	A/H/M	A/H/M	N/a	A/H
	Wind milling drag	N/a	A/H	N/a	A/H
	Feathering	N/a	A/H/M	N/a	A/H
	Design features for power absorption	N/a	A/H/M	N/a	A/H
	Adverse effects of torque reaction	N/a	A/H/M	N/a	A/H
	Gyroscopic precession	N/a	A/H/M	N/a	A/H
	Asymmetric slipstream effect	N/a	A/H/M	N/a	A/H
	Asymmetric blade effect	N/a	A/H/M	N/a	A/H
	Fixed-pitch wood or metal propellers	N/a	A/H/M	N/a	A/H
	Variable speed and controllable pitch propellers	N/a	A/H/M	N/a	A/H
	Constant speed propeller, action of governor	N/a	A/H/M	N/a	A/H
	Propeller shaft, direct drive, reduction gear	N/a	A/H/M	N/a	A/H
	Unfeathering	N/a	A/H/M	N/a	A/H
	Piston engine handling	A/H/M	A/H/M	N/a	A/H
	Warm-up and ground checks	A/H/M	A/H/M	N/a	A/H
	Testing of engines and systems	A/H/M	A/H/M	N/a	A/H
	Engine limitations	A/H/M	A/H/M	N/a	A/H

8.6	POWERPLANT – PISTON ENGINE	PPL	CPL	IR	ATPL
	Take-off power, climb power, control of temperature, cruise power, procedure for altering power settings	A/H/M	A/H/M	N/a	A/H
	MAP / RPM relationship	A/H/M	A/H/M	N/a	A/H
	Exhaust gas temperature monitoring	A/H/M	A/H/M	N/a	A/H
	Use of supercharger / turbo-supercharger	N/a	A/H	N/a	A/H
	Identification of engine faults	A/H/M	A/H/M	N/a	A/H
	Incorrect temperatures or pressures, rough running, vibration, loss of power, probable causes, trouble shooting procedure, importance of cross checking information	A/H/M	A/H/M	N/a	A/H

8.7	POWERPLANT: TURBO-PROPELLER AND TURBOJET	PPL	CPL	IR	ATPL
	Principle of operation	A/H	A/H	N/a	A/H
	Types of construction	N/a	A/H	N/a	A/H
	Centrifugal, axial flow	N/a	A/H	N/a	A/H
	Engine construction	N/a	A/H	N/a	A/H
	Air inlet	N/a	A/H	N/a	A/H
	Function	N/a	A/H	N/a	A/H
	Compressor	N/a	A/H	N/a	A/H
	Function	N/a	A/H	N/a	A/H
	Construction and mode of operation	N/a	A/H	N/a	A/H
	Effects of damage	N/a	A/H	N/a	A/H
	Compressor stall and surge	N/a	A/H	N/a	A/H
	Compressor characteristics	N/a	A/H	N/a	A/H
	Diffuser	N/a	A/H	N/a	A/H
	Function	N/a	A/H	N/a	A/H
	Combustion chamber	N/a	A/H	N/a	A/H
	Function, types and working principles	N/a	A/H	N/a	A/H
	Mixing ratio	N/a	A/H	N/a	A/H
	Fuel injectors	N/a	A/H	N/a	A/H
	Thermal load	N/a	A/H	N/a	A/H
	Turbine	N/a	A/H	N/a	A/H
	Function, construction and working principles	N/a	A/H	N/a	A/H
	Thermal and mechanical stress	N/a	A/H	N/a	A/H
	Effects of damage	N/a	A/H	N/a	A/H
	Monitoring of exhaust gas temperature	N/a	A/H	N/a	A/H
	Jet pipe	N/a	A/H	N/a	A/H
	Function, different types, noise suppression	N/a	A/H	N/a	A/H
	Pressure, temperature and airflow in a turbine engine	N/a	A/H	N/a	A/H
	Reverse thrust	N/a	A/H	N/a	A/H
	Function, types and principles of operation	N/a	A/H	N/a	A/H
	Degree efficiency	N/a	A/H	N/a	A/H
	Use and monitoring	N/a	A/H	N/a	A/H
	Performance and thrust augmentation	N/a	A/H	N/a	A/H
	Water injection, principles of operation	N/a	A/H	N/a	A/H
	Use and system monitoring	N/a	A/H	N/a	A/H
	Bleed air	N/a	A/H	N/a	A/H
	Effects of use of bleed air on thrust, exhaust temperature, RPM and pressure ratio	N/a	A/H	N/a	A/H

	Auxiliary gearbox	N/a	A/H	N/a	A/H
	Function	N/a	A/H	N/a	A/H
	Ignition	N/a	A/H	N/a	A/H
	Function, types, components, operation, safety aspects	N/a	A/H	N/a	A/H
	Starter	N/a	A/H	N/a	A/H
	Function, type, construction and mode of operation	N/a	A/H	N/a	A/H
	Control and monitoring	N/a	A/H	N/a	A/H
	Self-sustaining and idle speeds	N/a	A/H	N/a	A/H
	Engine start malfunctions	N/a	A/H	N/a	A/H
	Cause and avoidance	N/a	A/H	N/a	A/H
	Fuel system	N/a	A/H	N/a	A/H
	Construction, components	N/a	A/H	N/a	A/H
	Operation and monitoring	N/a	A/H	N/a	A/H
	Malfunctions	N/a	A/H	N/a	A/H
	Lubrication	N/a	A/H	N/a	A/H
	Construction, components	N/a	A/H	N/a	A/H
	Operation and monitoring	N/a	A/H	N/a	A/H
	Malfunctions	N/a	A/H	N/a	A/H
	Fuel	N/a	A/H	N/a	A/H
	Effects of temperature	N/a	A/H	N/a	A/H
	Impurities	N/a	A/H	N/a	A/H
	Additives	N/a	A/H	N/a	A/H
	Thrust	N/a	A/H	N/a	A/H
	Thrust formula	N/a	A/H	N/a	A/H
	Flat rated engine	N/a	A/H	N/a	A/H
	Thrust as a function of airspeed, air density, pressure, temperature, RPM	N/a	A/H	N/a	A/H
	Engine operation and monitoring	N/a	A/H	N/a	A/H
	Auxiliary Power Unit (APU)	N/a	A/H	N/a	A/H
	Function, types	N/a	A/H	N/a	A/H
	Location	N/a	A/H	N/a	A/H
	Operation and monitoring	N/a	A/H	N/a	A/H
	Ram air turbine	N/a	A/H	N/a	A/H
	Function	N/a	A/H	N/a	A/H

8.8	SPECIAL OPERATIONAL PROCEDURES	PPL	CPL	IR	ATPL
	Minimum equipment list	A/H	A/H	N/a	A/H
	Ground de-icing	N/a	A/H	N/a	A/H
	Icing conditions	N/a	A/H	N/a	A/H
	Definition and recognition, on ground / in flight	N/a	A/H	N/a	A/H
	De-icing, anti-icing, types of de-icing fluids	N/a	A/H	N/a	A/H
	Performance deterioration, on ground / in flight	N/a	A/H	N/a	A/H
	Bird strike and avoidance	A/H	A/H	N/a	A/H
	Noise abatement	N/a	A/H	N/a	A/H
	Influence of the flight procedure (departure, cruise, approach)	N/a	A/H	N/a	A/H
	Influence by the Pilot (power setting, low drag, low power)	N/a	A/H	N/a	A/H
	Fire / smoke	A/H	A/H	N/a	A/H
	Carburettor fire	A/H	A/H	N/a	A/H
	Engine fire	A/H	A/H	N/a	A/H

8.8	SPECIAL OPERATIONAL PROCEDURES	PPL	CPL	IR	ATPL
	Fire in the cabin, cockpit, freight compartment (choice of appropriate fire extinguishing agents according to fire classification and use of the extinguishers)	N/a	A/H	N/a	A/H
	Actions in cases of overheated brakes after aborted take-off and landing	N/a	A/H	N/a	A/H
	Smoke in the cockpit and the cabin (effects and actions taken)	N/a	A/H	N/a	A/H
	Decompression of pressurised cabin	N/a	A/H	N/a	A/H
	Slow decompression	N/a	A/H	N/a	A/H
	Rapid or explosive decompression	N/a	A/H	N/a	A/H
	Dangers and actions taken	N/a	A/H	N/a	A/H
	Windshear, micro-bursts	N/a	A/H	N/a	A/H
	Effects and recognition during departure and approach	N/a	A/H	N/a	A/H
	Actions to avoid and actions taken during encounter	N/a	A/H	N/a	A/H
	Wake turbulence	N/a	A/H	N/a	A/H
	Cause	N/a	A/H	N/a	A/H
	Influence of speed, mass and wind	N/a	A/H	N/a	A/H
	Actions taken when crossing traffic, during take-off and landing	N/a	A/H	N/a	A/H
	Security	N/a	A/H	N/a	A/H
	Unlawful events	N/a	A/H	N/a	A/H
	Emergency and precautionary landings	A/H	A/H	N/a	A/H
	Definition	A/H	A/H	N/a	A/H
	Cause	A/H	A/H	N/a	A/H
	Factors to be considered (wind, terrain, preparation, flight tactics, landings in various terrain and water)	A/H	A/H	N/a	A/H
	Passenger information	N/a	A/H	N/a	A/H
	Evacuation	N/a	A/H	N/a	A/H
	Actions after landing	N/a	A/H	N/a	A/H
	Fuel jettisoning	N/a	A/H	N/a	A/H
	Safety aspects	N/a	A/H	N/a	A/H
	Legal aspects	N/a	A/H	N/a	A/H
	Transport of dangerous goods	N/a	A/H	N/a	A/H
	Annex 18	N/a	A/H	N/a	A/H
	National legislation	N/a	A/H	N/a	A/H
	Practical aspects	N/a	A/H	N/a	A/H
	Contaminated runways	A/H	A/H	N/a	A/H
	Kinds of contamination	A/H	A/H	N/a	A/H
	Braking action, brake coefficient	N/a	A/H	N/a	A/H
	Performance correction and calculations	N/a	A/H	N/a	A/H

8.9	EMERGENCY EQUIPMENT	PPL	CPL	IR	ATPL
	Emergency equipment	A/H/ M	A/H/M	N/a	A/H
	Accessibility	A/H/ M	A/H/M	N/a	A/H
	Normal and emergency operation	N/a	A/H/M	N/a	A/H
	Markings	N/a	A/H	N/a	A/H

8.9	EMERGENCY EQUIPMENT	PPL	CPL	IR	ATPL
	Floor exit markings	N/a	A/H	N/a	A/H
	Crew emergency exits	N/a	A/H	N/a	A/H
	Passenger emergency exits, and	N/a	A/H	N/a	A/H
	Evacuation slides, general usage or as life rafts of floatation devices	N/a	A/H	N/a	A/H
	Smoke detection	N/a	A/H	N/a	A/H
	Location, indicators and function test	N/a	A/H	N/a	A/H
	Fire detection	N/a	A/H	N/a	A/H
	Location, warning mode and function test	N/a	A/H	N/a	A/H
	Fire fighting equipment	A/H	A/H	N/a	A/H
	Location, operation, contents, gauge and function test	N/a	A/H	N/a	A/H
	Aircraft oxygen equipment	N/a	A/H	N/a	A/H
	Principles of operation	N/a	A/H	N/a	A/H
	Protection and surveillance devices	N/a	A/H	N/a	A/H
	Drill, use of equipment in case of rapid decompression	N/a	A/H	N/a	A/H
	Comparison of constant flow and demand outlet masks	N/a	A/H	N/a	A/H
	Oxygen generators, and	N/a	A/H	N/a	A/H
	Dangers of oxygen use, safety measures	N/a	A/H	N/a	A/H
	Emergency equipment	A/H	A/H	N/a	A/H
	Portable, hand-held fire extinguisher	A/H	A/H	N/a	A/H
	Smoke mask, smoke protection hood	N/a	A/H	N/a	A/H
	Portable oxygen system	N/a	A/H	N/a	A/H
	Emergency locator beacon, transmitter	A/H	A/H	N/a	A/H
	Life jacket, life raft	N/a	A/H	N/a	A/H
	Pocket lamp, emergency lighting	A/H	A/H	N/a	A/H
	Megaphone	N/a	A/H	N/a	A/H
	Crash axe, and	N/a	A/H	N/a	A/H
	Fireproof gloves	N/a	A/H	N/a	A/H

9. AIR LAW

	Mozambique CIVIL AVIATION REGULATIONS (MOZ-CAR)	PPL	CPL	IR	ATPL
9.1	PART 1 – DEFINITIONS	A/H	A/H	N/a	A/H

9.2	PART 12 – PROCEDURES: AVIATION ACCIDENTS AND INVESTIGATIONS	PPL	CPL	IR	ATPL
9.2.1	SUBPART 1 – GENERAL	A/H/M	A/H/M	N/a	A/H
	12.01.1 – Applicability	A/H/M	A/H/M	N/a	A/H
	12.01.3 – Designation of investigator-in-charge	A/H/M	A/H/M	N/a	A/H

9.2.2	SUBPARTS 2 – ACCIDENT AND INCIDENT NOTIFICATION PROCEDURES	PPL	CPL	IR	ATPL
	12.02.1 – Notification of accidents	A/H/M	A/H/M	N/a	A/H
	12.02.2 – Notification of incidents	A/H/M	A/H/M	N/a	A/H
	12.02.3 – Notification of accidents outside the Republic	A/H/M	A/H/M	N/a	A/H
	12.02.4 – Particulars of notification	A/H/M	A/H/M	N/a	A/H

9.2.2	SUBPARTS 2 – ACCIDENT AND INCIDENT NOTIFICATION PROCEDURES	PPL	CPL	IR	ATPL
	12.02.5 – Notification of hazards	A/H/M	A/H/M	N/a	A/H
9.2.3	SUBPART 4 – SCENE OF AN ACCIDENT	PPL	CPL	IR	ATPL
	12.04.1 – Guarding of aircraft involved in an accident	A/H/M	A/H/M	N/a	A/H
	12.04.2 – Interference with objects and marks at scene of accident	A/H/M	A/H/M	N/a	A/H
9.2.4	SUBPART 5 – REPORTING AND REOPENING OF INVESTIGATION	PPL	CPL	IR	ATPL
	12.05.2 – Appeal against findings on investigation	A/H	A/H	N/a	A/H
9.3	PART 21 – CERTIFICATION PROCEDURES FOR PRODUCTS AND PARTS	PPL	CPL	IR	ATPL
	21.08.1 – Categories of certificates of airworthiness	A/H/M	A/H/M	N/a	A/H
	21.08.8 – Period of validity	A/H/M	A/H/M	N/a	A/H
	21.08.10 – Transferability	A/H/M	A/H/M	N/a	A/H
9.4	PART 47 – REGISTRATION AND MARKINGS	PPL	CPL	IR	ATPL
	47.00.1 – Applicability	A/H/M	A/H/M	N/a	A/H
	47.00.2 – Requirements for application	A/H/M	A/H/M	N/a	A/H
	47.00.3 – Requirements for aircraft marking	A/H/M	A/H/M	N/a	A/H
9.5	PART 61 – PERSONNEL: PILOT LICENSING				
9.5.1	SUBPART 1 – GENERAL	PPL	CPL	IR	ATPL
	61.01.1 – Applicability	A/H/M	A/H/M	N/a	A/H
	61.01.2 – Authority to act as pilot	A/H/M	A/H/M	N/a	A/H
	61.01.3 – Pilot licenses	A/H/M	A/H/M	N/a	A/H
	61.01.4 – Ratings for pilots and instructors	A/H/M	A/H/M	N/a	A/H
	61.01.5 – Category ratings	A/H/M	A/H/M	N/a	A/H
	61.01.6 – Class ratings	A/H/M	A/H/M	N/a	A/H
	61.01.7 – Type and group type ratings	A/H/M	A/H/M	N/a	A/H
	61.01.8 – Ratings for special purposes	A/H/M	A/H/M	N/a	A/H
	61.01.9 – Competency	A/H/M	A/H/M	N/a	A/H
	61.01.10 – Medical fitness	A/H/M	A/H/M	N/a	A/H
	61.01.11 – Language	A/H/M	A/H/M	N/a	A/H
	61.01.12 – Logbooks	A/H/M	A/H/M	N/a	A/H
	61.01.13 – Curtailment of privileges of license holders aged 60 years or more	A/H/M	A/H/M	N/a	A/H
	61.01.14 – Retesting after failure	A/H/M	A/H/M	N/a	A/H
	61.01.15 – Suspension and cancellation of license and appeal	A/H/M	A/H/M	N/a	A/H
	61.01.16 – Crediting flight time	A/H/M	A/H/M	N/a	A/H
	61.01.17 – Designation of examiner	A/H/M	A/H/M	N/a	A/H
	61.01.18 – Validation of license issued by a appropriate authority	A/H/M	A/H/M	N/a	A/H
	61.01.19 – Documentation	A/H/M	A/H/M	N/a	A/H

9.5	PART 61 – PERSONNEL: PILOT LICENSING				
9.5.1	SUBPART 1 – GENERAL	PPL	CPL	IR	ATPL
	61.01.20 – Register of license	A/H/M	A/H/M	N/a	A/H
	61.01.21 – Aviation training organisation	A/H/M	A/H/M	N/a	A/H

9.5.2	SUBPART 2 – 9 – PILOT LICENSES	PPL	CPL	IR	ATPL
	Requirements for pilot license	A/H/M	A/H/M	N/a	A/H
	Experience	A/H/M	A/H/M	N/a	A/H
	Training	A/H/M	A/H/M	N/a	A/H
	Theoretical knowledge examinations	A/H/M	A/H/M	N/a	A/H
	Skill test	A/H/M	A/H/M	N/a	A/H
	Certificate of competency	A/H/M	A/H/M	N/a	A/H
	Application for pilot license	A/H/M	A/H/M	N/a	A/H
	Issuing of pilot license	A/H/M	A/H/M	N/a	A/H
	Period of validity	A/H/M	A/H/M	N/a	A/H
	Privileges of pilot license	A/H/M	A/H/M	N/a	A/H
	Rating for special purposes	A/H/M	A/H/M	N/a	A/H
	Maintenance of competency	A/H/M	A/H/M	N/a	A/H

9.5.3	SUBPART 19 –TYPE RATING	PPL	CPL	IR	ATPL
	61.19.1 – Requirements for instrument rating	A/H/M	A/H/M	N/a	A/H
	61.19.2 – Training	A/H/M	A/H/M	N/a	A/H
	61.19.3 – Theoretical knowledge examination	A/H/M	A/H/M	N/a	A/H
	61.19.4 – Skill test	A/H/M	A/H/M	N/a	A/H
	61.19.5 – Application for instrument rating	A/H/M	A/H/M	N/a	A/H
	61.19.6 – Issuing of instrument rating	A/H/M	A/H/M	N/a	A/H
	61.19.7 – Period of validity	A/H/M	A/H/M	N/a	A/H
	61.19.8 – Privileges	A/H/M	A/H/M	N/a	A/H
	61.19.9 – Notification of addition type to group type	A/H/M	A/H/M	N/a	A/H
	61.19.10 – Notification of addition type rating	A/H/M	A/H/M	N/a	A/H
	61.19.11 – Renewal	A/H/M	A/H/M	N/a	A/H
	61.19.12 – Reissue	A/H/M	A/H/M	N/a	A/H

9.5.4	SUBPART 20 – INSTRUMENT RATING	PPL	CPL	IR	ATPL
	61.20.1 – Requirements for instrument rating	A/H	A/H	X	A/H
	61.20.2 – Experience	A/H	A/H	X	A/H
	61.20.3 – Training	A/H	A/H	X	A/H
	61.20.4 – Theoretical knowledge examination	A/H	A/H	X	A/H
	61.20.5 – Skill test	A/H	A/H	X	A/H
	61.20.6 – Application for instrument rating	A/H	A/H	X	A/H
	61.20.7 – Issuing of instrument rating	A/H	A/H	X	A/H
	61.20.8 – Period of validity	A/H	A/H	X	A/H
	61.20.9 – Rating required by person flying under IFR	A/H	A/H	X	A/H
	61.20.10 – Privileges of instrument rating	A/H	A/H	X	A/H
	61.20.11 – Renewal	A/H	A/H	X	A/H

9.5.5	SUBPART 30 –TUG RATING	PPL	CPL	IR	ATPL
	61.45.1 – Requirements for tug pilot rating	A/H/M	A/H/M	N/a	N/a
	61.45.2 – Experience	A/H/M	A/H/M	N/a	N/a
	61.45.3 – Application for tug pilot rating	A/H/M	A/H/M	N/a	N/a

9.5.5	SUBPART 30 –TUG RATING	PPL	CPL	IR	ATPL
	61.45.4 – Issuing of tug pilot rating	A/H/M	A/H/M	N/a	N/a
	61.45.6 – Privileges	A/H/M	A/H/M	N/a	N/a
	61.45.7 – Period of validity	A/H/M	A/H/M	N/a	N/a

9.5.6	SUBPART 31 – EXTERNAL LOAD RATING (HELICOPTER)	PPL	CPL	IR	ATPL
	61.31.1 – Requirements for external load rating (helicopter)	H	H	N/a	N/a
	61.31.2 – Experience	H	H	N/a	N/a
	61.31.3 – Training	H	H	N/a	N/a
	61.31.4 – Application for external load rating (helicopter)	H	H	N/a	N/a
	61.31.5 – Issuing of external load rating (helicopter)	H	H	N/a	N/a
	61.31.6 – Privileges of external load rating (helicopter)	H	H	N/a	N/a
	61.31.7 – Period of validity	H	H	N/a	N/a

9.5.7	SUBPART 32 –AGRICULTURAL RATING	PPL	CPL	IR	ATPL
	61.32.1 – Requirements for Agricultural rating	A/H/M	A/H/M		
	61.32.2 – Experience	A/H/M	A/H/M	N/a	N/a
	61.32.3 – Skill test	A/H/M	A/H/M	N/a	N/a
	61.32.4 – Application for Agricultural rating	A/H/M	A/H/M	N/a	N/a
	61.32.5 – Issuing of Agricultural rating	A/H/M	A/H/M	N/a	N/a
	61.32.6 – Privileges	A/H/M	A/H/M	N/a	N/a
	61.32.7 – Period of validity	A/H/M	A/H/M	N/a	N/a

9.6	PART 67 – PERSONNEL: MEDICAL CERTIFICATION	PPL	CPL	IR	ATPL
	67.00.1 – Applicability	A/H/M	A/H/M	N/a	A/H
	67.00.2 – Classes of medical certificates	A/H/M	A/H/M	N/a	A/H
	67.00.6 – Period of validity of medical certificates	A/H/M	A/H/M	N/a	A/H
	67.00.7 – Application for medical certificates	A/H/M	A/H/M	N/a	A/H
	67.00.8 – Issuing of medical certificates	A/H/M	A/H/M	N/a	A/H
	67.00.9 – Duties of holder of medical certificate	A/H/M	A/H/M	N/a	A/H
	67.00.10 – Foreign medical assessments	A/H/M	A/H/M	N/a	A/H
	67.00.11 – Appeal	A/H/M	A/H/M	N/a	A/H
	67.00.12 – Period of validity of medical records	A/H/M	A/H/M	N/a	A/H
	67.00.13 – Medical confidentiality	A/H/M	A/H/M	N/a	A/H

9.7	PART 91 – GENERAL OPERATING AND FLIGHT RULES				
9.7.1	SUBPART 1 – GENERAL PROVISIONS	PPL	CPL	IR	ATPL
	91.01.1 – Applicability	A/H/M	A/H/M	N/a	A/H
	91.01.2 – Authority of pilot-in-command	A/H/M	A/H/M	N/a	A/H
	91.01.3 – Authority of personnel to taxi aeroplanes	A/H/M	A/H/M	N/a	A/H
	91.01.4 – Search and rescue information	A/H/M	A/H/M	N/a	A/H

9.7	PART 91 – GENERAL OPERATING AND FLIGHT RULES				
9.7.1	SUBPART 1 – GENERAL PROVISIONS	PPL	CPL	IR	ATPL
	91.01.5 – Information on emergency and survival equipment carried	A/H/M	A/H/M	N/a	A/H
	91.01.6 – Method of carriage of persons	A/H/M	A/H/M	N/a	A/H
	91.01.7 – Admission to flight deck	A/H/M	A/H/M	N/a	A/H
	91.01.8 – Unauthorized carriage	A/H/M	A/H/M	N/a	A/H
	91.01.9 – Portable electronic devices	A/H/M	A/H/M	N/a	A/H
	91.01.10 – Endangering safety	A/H/M	A/H/M	N/a	A/H
	91.01.11 – Preservation of documents	A/H/M	A/H/M	N/a	A/H

9.7.2	SUBPART 2 – FLIGHT CREW	PPL	CPL	IR	ATPL
	91.02.1 – Composition of flight crew	A/H/M	A/H/M	N/a	A/H
	91.02.2 – Flight crew member emergency duties	A/H/M	A/H/M	N/a	A/H
	91.02.3 – Flight crew member responsibilities	A/H/M	A/H/M	N/a	A/H
	91.02.4 – Regency	A/H/M	A/H/M	N/a	A/H
	91.02.5 – Flight crew members at duty stations	A/H/M	A/H/M	N/a	A/H
	91.02.6 – Laws, regulations and procedures	A/H/M	A/H/M	N/a	A/H
	91.02.7 – Duties of pilot-in-command regarding flight preparation	A/H/M	A/H/M	N/a	A/H
	91.02.8 – Duties of pilot-in-command regarding flight operations	A/H/M	A/H/M	N/a	A/H

9.7.3	SUBPART 3 – DOCUMENTATION AND RECORDS	PPL	CPL	IR	ATPL
	91.03.1 – Documents to be carried on board	A/H/M	A/H/M	N/a	A/H
	91.03.2 – Aircraft flight manual	A/H/M	A/H/M	N/a	A/H
	91.03.3 – Aircraft checklist	A/H/M	A/H/M	N/a	A/H
	91.03.4 – Air traffic service flight plan	A/H/M	A/H/M	N/a	A/H
	91.03.5 – Flight folio	A/H/M	A/H/M	N/a	A/H
	91.03.6 – Fuel and oil record	A/H/M	A/H/M	N/a	A/H
	91.03.7 – Certificate of release to service	A/H/M	A/H/M	N/a	A/H
	91.03.8 – Flight recorder records	A/H/M	A/H/M	N/a	A/H

9.7.4	SUBPART 4 – INSTRUMENT AND EQUIPMENT	PPL	CPL	IR	ATPL
	91.04.1 – Use of instruments and equipment by pilot	A/H/M	A/H/M	X	A/H
	91.04.2 Circuit protection devices	A/H/M	A/H/M	X	A/H
	91.04.3 – Aircraft operating lights	A/H/M	A/H/M	X	A/H
	91.04.4 – Flight, navigation and associated equipment for aircraft operating under VFR	A/H/M	A/H/M	X	A/H
	91.04.5 – Flight, navigation and associated equipment for aircraft operating under IFR	N/a	A/H	X	A/H
	91.04.6 – Additional equipment for single-pilot operating in accordance with IFR	N/a	A/H	X	A/H
	91.04.7 – Mach number indicator	A/H/M	A/H/M	X	A/H
	91.04.9 – Equipment for operating in icing conditions	A/H/M	A/H/M	X	A/H

9.7.4	SUBPART 4 – INSTRUMENT AND EQUIPMENT	PPL	CPL	IR	ATPL
	91.04.14 – Seats, seat safety belts, harnesses and child restraint devices	A/H/M	A/H/M	X	A/H
	91.04.15 – Stowage of articles, baggage and cargo	A/H/M	A/H/M	X	A/H
	91.04.16 – Standard first aid kit	A/H/M	A/H/M	X	A/H
	91.04.18 – Supplemental oxygen in the case of non-pressurised aircraft	A/H/M	A/H/M	X	A/H
	91.04.19 – Supplemental oxygen in the case of pressurised aircraft	N/a	A/H	X	A/H
	91.04.21 – Hand fire extinguishers	A/H	A/H	N/a	A/H
	91.04.26 – Automatic emergency locator transmitter	A/H	A/H	X	A/H
	91.04.27 – Life jackets and other flotation devices	A/H	A/H	N/a	A/H
	91.04.28 – Life rafts and survival radio equipment for extended over-water flights	A/H	A/H	N/a	A/H
	91.04.29 – Survival Equipment	A/H	A/H	N/a	A/H
	91.04.30 – Seaplanes, amphibious aeroplanes and amphibious helicopters	A/H	A/H	N/a	A/H

9.7.5	SUBPART 5 – COMMUNICATION AND NAVIGATION EQUIPMENT	PPL	CPL	IR	ATPL
	91.05.1 – Communication equipment	A/H/M	A/H/M	N/a	A/H
	91.05.2 – Navigation equipment	A/H/M	A/H/M	N/a	A/H

9.7.6	SUBPART 6 – RULES OF THE AIR				
9.7.6.1	DIVISION ONE: FLIGHT RULES	PPL	CPL	IR	ATPL
	91.06.1 – Landing on roads	A/H/M	A/H/M	N/a	A/H
	91.06.2 Dropping objects, spraying or dusting	A/H/M	A/H/M	N/a	A/H
	91.06.3 – Picking of objects	A/H/M	A/H/M	N/a	A/H
	91.06.4 – Towing	A/H/M	A/H/M	N/a	A/H
	91.06.5 – Operating of vehicle- or vessel-towed aircraft	A/H/M	A/H/M	N/a	A/H
	91.06.6 – Proximity and formation lights	A/H/M	A/H/M	N/a	A/H
	91.06.7 – Right of way	A/H/M	A/H/M	N/a	A/H
	91.06.8 – Following line features	A/H/M	A/H/M	N/a	A/H
	91.06.9 – Aircraft speed	A/H/M	A/H/M	N/a	A/H
	91.06.10 – Lights to be displayed by aircraft	A/H/M	A/H/M	N/a	A/H
	91.06.11 – Taxi rules	A/H/M	A/H/M	N/a	A/H
	91.06.12 – Operation on and in the vicinity of an aerodrome	A/H/M	A/H/M	N/a	A/H
	91.06.13 – Signals	A/H/M	A/H/M	N/a	A/H
	91.06.14 – Water operations	A/H/M	A/H/M	N/a	A/H
	91.06.15 – Reporting position	A/H/M	A/H/M	N/a	A/H
	91.06.16 – Mandatory radio communication in controlled airspace	A/H/M	A/H/M	N/a	A/H
	91.06.17 – Mandatory radio communication in advisory airspace	A/H/M	A/H/M	N/a	A/H
	91.06.18 – Compliance with air traffic control clearance and instructions	A/H/M	A/H/M	N/a	A/H

9.7.6	SUBPART 6 – RULES OF THE AIR				
9.7.6.1	DIVISION ONE: FLIGHT RULES	PPL	CPL	IR	ATPL
	91.06.19 – Prohibited areas	A/H/M	A/H/M	N/a	A/H
	91.06.20 – Restricted areas	A/H/M	A/H/M	N/a	A/H
9.7.6.2	DIVISION TWO: VISUAL FLIGHT RULES	PPL	CPL	IR	ATPL
	91.06.21 – Visibility and distance from cloud	A/H/M	A/H/M	N/a	A/H
	91.06.22 – Special VFR weather minima	A/H/M	A/H/M	N/a	A/H
	91.06.23 – Responsibility to ascertain whether VFR flight is permitted	A/H/M	A/H/M	N/a	A/H
9.7.6.3	DIVISION THREE – INSTRUMENT FLIGHT RULES	PPL	CPL	IR	ATPL
	91.06.24 – Compliance with IFR	A/H	A/H	X	A/H
	91.06.25 – Aircraft equipment	A/H	A/H	X	A/H
	91.06.26 – Changes from IFR flight to VFR flight	A/H	A/H	X	A/H
	91.06.27 – IFR procedures	A/H	A/H	X	A/H
9.7.6.4	DIVISION FOUR: AIRCRAFT ON OTHER THAN SCHEDULED INTERNATIONAL AIR SERVICES	PPL	CPL	IR	ATPL
	91.06.28 – Foreign military aircraft	A/H	A/H	N/a	N/a
	91.06.29 – Identification and interpretation of aircraft	A/H	A/H	N/a	N/a
9.7.6.5	DIVISION FIVE: AIR TRAFFIC RULES	PPL	CPL	IR	ATPL
	91.06.30 – Air traffic service procedures	A/H/M	A/H/M	N/a	A/H
	91.06.31 – Priority	A/H/M	A/H/M	N/a	A/H
9.7.6.6	DIVISION SIX : HEIGHTS AND INSTRUMENT APPROACH AND DEPARTURE PROCEDURES	PPL	CPL	IR	ATPL
	91.06.32 – Minimum heights	A/H	A/H	N/a	A/H
	91.06.33 – Semi-circular rule	A/H	A/H	N/a	A/H
	91.06.34 – Standard instrument approach to and departure from aerodrome	A/H	A/H	N/a	A/H
9.7.7	SUBPART 7 – FLIGHT OPERATIONS	PPL	CPL	IR	ATPL
	91.07.1 – Routes and areas of operation	A/H/M	A/H/M	N/a	A/H
	91.07.2 – Minimum flight altitudes	A/H/M	A/H/M	N/a	A/H
	91.07.3 – Use of aerodromes	A/H/M	A/H/M	N/a	A/H
	91.07.4 – Helicopter landing and take-offs	A/H/M	A/H/M	N/a	A/H
	91.07.5 – Aerodrome operating minima	A/H/M	A/H/M	N/a	A/H
	91.07.7 – Pre-flight selection of aerodromes	A/H/M	A/H/M	N/a	A/H
	91.07.8 – Planning minima for IFR flights	A/H/M	A/H/M	N/a	A/H
	91.07.9 – Meteorological conditions	A/H/M	A/H/M	N/a	A/H
	91.07.10 – VFR operating minima	A/H/M	A/H/M	N/a	A/H
	91.07.11 – Mass and balance	A/H/M	A/H/M	N/a	A/H
	91.07.12 – Fuel and oil supply	A/H/M	A/H/M	N/a	A/H
	91.07.13 – Refuelling or Refuelling with passengers on board	A/H/M	A/H/M	N/a	A/H
	91.07.14 – Smoking in aircraft	A/H/M	A/H/M	N/a	A/H

9.7.7	SUBPART 7 – FLIGHT OPERATIONS	PPL	CPL	IR	ATPL
	91.07.15 – Instrument approach and departure procedures	A/H/M	A/H/M	N/a	A/H
	91.07.16 – Noise abatement procedures	A/H/M	A/H/M	N/a	A/H
	91.07.17 – Submission of air traffic service flight plan	A/H/M	A/H/M	N/a	A/H
	91.07.18 – Seats, safety belts and harnesses	A/H/M	A/H/M	N/a	A/H
	91.07.19 – Passenger seating	A/H/M	A/H/M	N/a	A/H
	91.07.20 – Passenger briefing	A/H/M	A/H/M	N/a	A/H
	91.07.21 – Emergency equipment	A/H/M	A/H/M	N/a	A/H
	91.07.22 – Illumination of emergency exits	A/H/M	A/H/M	N/a	A/H
	91.07.23 – Use of supplemental oxygen	A/H/M	A/H/M	N/a	A/H
	91.07.24 – Approach and landing conditions	A/H/M	A/H/M	N/a	A/H
	91.07.25 – Commencement and continuation of approach	A/H/M	A/H/M	N/a	A/H
	91.07.26 – In-flight simulation of emergency situations	A/H/M	A/H/M	N/a	A/H
	91.07.28 – Starting of engines	A/H/M	A/H/M	N/a	A/H

9.7.8	SUBPART 8 : LOW VISIBILITY OPERATIONS	PPL	CPL	IR	ATPL
	91.08.1 – Aerodrome operating minima	A/H	A/H	N/a	A/H
	91.08.2 – General operating rules for low visibility operations	N/a	A/H	N/a	A/H
	91.08.3 – Aerodrome considerations for low visibility operations	N/a	A/H	N/a	A/H
	91.08.4 – Training and qualification for low visibility operations	N/a	A/H	N/a	A/H
	91.08.5 – Operating procedures for low visibility operations	N/a	A/H	N/a	A/H
	91.08.6 – Minimum equipment for low visibility operations	N/a	A/H	N/a	A/H

9.7.9	SUBPART 9 – PERFORMANCE OPERATING LIMITATIONS	PPL	CPL	IR	ATPL
	91.09.1 – General provisions	A/H/M	A/H/M	N/a	A/H
	91.09.2 – Helicopter operating limitations	H	H	N/a	H
	91.09.3 – Helicopter performance classification	H	H	N/a	H
	91.09.4 – Aeroplane performance classification	A/M	A/M	N/a	A

9.7.10	SUBPART 10 – MAINTENANCE	PPL	CPL	IR	ATPL
	91.10.1 – General	A/H/M	A/H/M	N/a	A/H

9.8	PART 92 – CONVEYANCE OF DANGEROUS GOODS	PPL	CPL	IR	ATPL
	92.00.1 – Applicability	N/a	A/H/M	N/a	A/H
	92.00.2 – Conveyance of dangerous goods forbidden	N/a	A/H/M	N/a	A/H
	92.00.3 – Exemption	N/a	A/H/M	N/a	A/H
	92.00.4 – Classification, division and listing of dangerous goods	N/a	A/H/M	N/a	A/H

9.9	COMMERCIAL AIR TRANSPORT OPERATIONS (Parts 121, 127, 135)				
9.9.1	SUBPART 1 : GENERAL	PPL	CPL	IR	ATPL
	Applicability	N/a	A/H	N/a	A/H
	Exemptions	N/a	A/H	N/a	A/H
	Admission to flight deck	N/a	A/H	N/a	A/H
	Drunkenness	N/a	A/H	N/a	A/H
9.9.2	SUBPART 2: FLIGHT CREW	PPL	CPL	IR	ATPL
	Composition of flight crew	N/a	A/H	N/a	A/H
	In-flight relief of flight crew members	N/a	A/H	N/a	A/H
	Flight crew member emergency duties	N/a	A/H	N/a	A/H
	Recency, route and aerodrome qualifications	N/a	A/H	N/a	A/H
	Flight time and duty periods	N/a	A/H	N/a	A/H
9.9.3	SUBPART 3 : TRAINING AND CHECKING	PPL	CPL	IR	ATPL
9.9.3.1	DIVISION ONE : GENERAL				
	Training of flight crew members	N/a	A/H	N/a	A/H
	Initial training of flight crew members	N/a	A/H	N/a	A/H
9.9.3.2	DIVISION TWO : PILOT TRAINING	PPL	CPL	IR	ATPL
	Conversion training	N/a	A/H	N/a	A/H
	Differences training and familiarisation training	N/a	A/H	N/a	A/H
	Upgrading to pilot-in-command	N/a	A/H	N/a	A/H
	Pilot-in-command holding commercial pilot license	N/a	A/H	N/a	A/H
	Recurrent training and checking	N/a	A/H	N/a	A/H
	Pilot qualification to operate in either pilot seat	N/a	A/H	N/a	A/H
	Advanced qualification programme	N/a	A/H	N/a	A/H
9.9.4	SUBPART 4 : DOCUMENTATION AND RECORDS	PPL	CPL	IR	ATPL
	Documents to be retained on the ground	N/a	A/H	N/a	A/H
	Operational manual	N/a	A/H	N/a	A/H
	Aeroplane operating manual	N/a	A/H	N/a	A/H
	Operational flight plan	N/a	A/H	N/a	A/H
	Flight time and duty period records	N/a	A/H	N/a	A/H
	Records of emergency and survival equipment	N/a	A/H	N/a	A/H
	Flight crew member training records	N/a	A/H	N/a	A/H
	Load and trim sheet	N/a	A/H	N/a	A/H
	Aeroplane / Helicopter checklist	N/a	A/H	N/a	A/H
9.9.5	SUBPART 5 : AEROPLANE INSTRUMENT AND EQUIPMENT	PPL	CPL	IR	ATPL
	Approval of instruments and equipment	N/a	A/H	N/a	A/H
	Flight, navigation and associated equipment for aeroplanes / helicopters operated under VFR	N/a	A/H	N/a	A/H
	Flight, navigation and associated equipment for aeroplanes / helicopters operated under IFR	N/a	A/H	N/a	A/H
	Altitude alerting system	N/a	A/H	N/a	A/H
	Ground proximity warning system	N/a	A/H	N/a	A/H
	Airborne weather radar equipment	N/a	A/H	N/a	A/H
	Cockpit crew interphone system	N/a	A/H	N/a	A/H

9.9.5	SUBPART 5 : AEROPLANE INSTRUMENT AND EQUIPMENT	PPL	CPL	IR	ATPL
	Cosmic radiation detection equipment	N/a	A/H	N/a	A/H
	Flight deck crew interphone system	N/a	A/H	N/a	A/H
	Flight crew interphone system	N/a	A/H	N/a	A/H
	Public address system	N/a	A/H	N/a	A/H
	Windshield wipers	N/a	A/H	N/a	A/H
	Internal doors and curtains	N/a	A/H	N/a	A/H
	Emergency medical kit	N/a	A/H	N/a	A/H
	Means for emergency evacuation	N/a	A/H	N/a	A/H
	Helicopters certified for operating on water	N/a	A/H	N/a	A/H
	Survival suits	N/a	A/H	N/a	A/H

9.9.6	SUBPART 6: OPERATING CERTIFICATE	PPL	CPL	IR	ATPL
	Operating certificate	N/a	A/H	N/a	A/H

9.9.7	SUBPART 7 : FLIGHT OPERATIONS	PPL	CPL	IR	ATPL
	Routes and areas of operation	N/a	A/H	N/a	A/H
	Minimum flight altitudes	N/a	A/H	N/a	A/H
	Aerodrome / heliport operating minima	N/a	A/H	N/a	A/H
	Offshore operations	N/a	A/H	N/a	A/H
	Smoking in aeroplane / helicopter	N/a	A/H	N/a	A/H
	Ditching	N/a	A/H	N/a	A/H
	Fuel policy	N/a	A/H	N/a	A/H
	Fuel and Oil supply	N/a	A/H	N/a	A/H
	Instrument approach and departure procedures	N/a	A/H	N/a	A/H
	Noise abatement procedures	N/a	A/H	N/a	A/H
	Carriage of infants and children	N/a	A/H	N/a	A/H
	Carriage on passengers with disability	N/a	A/H	N/a	A/H
	Limitations on carriage of infants, children and passengers disability	N/a	A/H	N/a	A/H
	Carriage of inadmissible passengers, deportees or persons in custody	N/a	A/H	N/a	A/H
	Carry-on baggage	N/a	A/H	N/a	A/H
	Securing of passenger cabin and galley	N/a	A/H	N/a	A/H
	Passenger services	N/a	A/H	N/a	A/H
	Incidents and defects	N/a	A/H	N/a	A/H

9.9.8	SUBPART 8 : AEROPLANE OR HELICOPTER OPERATING LIMITATIONS	PPL	CPL	IR	ATPL
	Classification	N/a	A/H	N/a	A/H
	General provisions for all classes of aeroplanes	N/a	A/H	N/a	A/H

9.9.8.1	DIVISION ONE : CLASS A AEROPLANE OR CLASS I HELICOPTER	PPL	CPL	IR	ATPL
	General	N/a	A/H	N/a	A/H
	Take-off	N/a	A/H	N/a	A/H
	(Net) take-off flight path	N/a	A/H	N/a	A/H
	En route with one engine inoperative	N/a	A/H	N/a	A/H
	En route with one or more engines inoperative	N/a	A/H	N/a	A/H
	En route with two engines inoperative in case of aeroplanes with three or more engines	N/a	A/H	N/a	A/H
	Landing at destination and alternate aerodromes	N/a	A/H	N/a	A/H

9.9.8.1	DIVISION ONE : CLASS A AEROPLANE OR CLASS I HELICOPTER	PPL	CPL	IR	ATPL
	Landing on dry runways	N/a	A/H	N/a	A/H
	Landing of wet and contaminated runways	N/a	A/H	N/a	A/H
	Approach and landing	N/a	A/H	N/a	A/H

9.9.8.2	DIVISION TWO : CLASS B AEROPLANE OR CLASS II helicopter	PPL	CPL	IR	ATPL
	General	N/a	A/H	N/a	A/H
	Take-off	N/a	A/H	N/a	A/H
	Take-off flight path	N/a	A/H	N/a	A/H
	En route	N/a	A/H	N/a	A/H
	En route with one or more engines inoperative	N/a	A/H	N/a	A/H
	Landing at destination and alternate aerodromes	N/a	A/H	N/a	A/H
	Landing on dry runways	N/a	A/H	N/a	A/H
	Landing on wet and contaminated runways	N/a	A/H	N/a	A/H
	Landing	N/a	A/H	N/a	A/H

9.9.8.3	DIVISION THREE: CLASS C / D AEROPLANE OR CLASS III HELICOPTER	PPL	CPL	IR	ATPL
	General	N/a	A/H	N/a	A/H
	Take-off	N/a	A/H	N/a	A/H
	Take-off flight plan	N/a	A/H	N/a	A/H
	En-route	N/a	A/H	N/a	A/H
	En-route with all engines operative	N/a	A/H	N/a	A/H
	En route with one engine inoperative	N/a	A/H	N/a	A/H
	En route with two engines inoperative in case of aeroplanes with three or more engines	N/a	A/H	N/a	A/H
	Landing at destination and alternate aerodromes	N/a	A/H	N/a	A/H
	Landing on dry runways	N/a	A/H	N/a	A/H
	Landing on wet and contaminated runways	N/a	A/H	N/a	A/H
	Landing	N/a	A/H	N/a	A/H

9.9.9	SUBPART 9	PPL	CPL	IR	ATPL
	MAINTENANCE				
	General	N/a	A/H	N/a	A/H
	Aeroplane / Helicopter maintenance schedule	N/a	A/H	N/a	A/H
	Maintenance contracted to approved aircraft maintenance organisation	N/a	A/H	N/a	A/H

9.10	PART 139 – AERODROME AND HELIPORTS – LICENSING AND OPERATION				
9.10.1	SUBPART 1 : GENERAL	PPL	CPL	IR	ATPL
	139.01.1 – Applicability	A/H/M	A/H/M	N/a	A/H
	139.01.2 – use of military aerodrome and heliports	A/H/M	A/H/M	N/a	A/H
	139.01.3 - Restrictions	A/H/M	A/H/M	N/a	A/H
	139.01.4 – Publication of restrictions and deviations	A/H/M	A/H/M	N/a	A/H
	139.01.5 – Flights by night	N/a	A/H/M	N/a	A/H
	139.01.10 – Safety measures against fire	N/a	A/H/M	N/a	A/H

9.10.1	SUBPART 1 : GENERAL	PPL	CPL	IR	ATPL
	139.01.12 – Use of runways or taxiways and landing at or taking off from aerodrome	A/H/M	A/H/M	N/a	A/H

9.11	PART 172 – AIR TRAFFIC SERVICES: AIRSPACE AND AIR TRAFFIC SERVICES	PPL	CPL	IR	ATPL
	172.01.1 – Applicability	A/H/M	A/H/M	N/a	A/H
	172.01.2 – Classification of airspace	A/H/M	A/H/M	N/a	A/H
9.11.1	SUBPART 2 : DESIGNATION AND CLASSIFICATION OF AIRSPACE				
	172.02.1 – Designation of airspace	A/H/M	A/H/M	N/a	A/H
	172.02.2 – Classification of airspace	A/H/M	A/H/M	N/a	A/H
	172.02.3 – Designation of control areas	A/H/M	A/H/M	N/a	A/H
	172.02.4 – Designation of flight information regions	A/H/M	A/H/M	N/a	A/H
	172.02.5 – Designation of advisory areas	A/H/M	A/H/M	N/a	A/H

9.12	MOZAMBIQUE CIVIL AVIATION TECHNICAL STANDARDS (MOZ - CATS)				
9.12.1	PART 91 – GENERAL OPERATING AND FLIGHT RULES	PPL	CPL	IR	ATPL
	91.06.10 – Lights to be displayed by aircraft	A/H/M	A/H/M	N/a	A/H
	91.06.21 – Visibility and distance from cloud	A/H/M	A/H/M	N/a	A/H
	91.06.29 – Identification and interception of aircraft	A/H/M	A/H/M	N/a	A/H
	91.06.33 – Semi-circular rule	A/H/M	A/H/M	N/a	A/H
	91.07. 12 – Fuel and Oil supply	A/H/M	A/H/M	N/a	A/H

9.13	AERONAUTICAL INFORMATION CIRCULARS	PPL	CPL	IR	ATPL
	20.2 – Altimeter setting procedures	A/H	A/H	N/a	A/H
	42.1 – Filing of flight plans and wake turbulence	A/H	A/H	N/a	A/H

9.14	INTERNATIONAL CIVIL AVIATION ORGANISATION (ICAO) DOCUMENT 7300/7 – CONVENTION ON INTERNATIONAL CIVIL AVIATION				
9.14.1	CHAPTER 1 – GENERAL PRINCIPLES	PPL	CPL	IR	ATPL
	Article 1 – Sovereignty	A/H/M	A/H/M	N/a	A/H
	Article 2 – Territory	A/H/M	A/H/M	N/a	A/H
	Article 3 – Civil and State aircraft	A/H/M	A/H/M	N/a	A/H

9.14.2	CHAPTER 2 – FLIGHT OVER TERRITORY OF CONTRACTING STATES	PPL	CPL	IR	ATPL
	Article 5 – Right of non-scheduled flight	N/a	A/H/M	N/a	A/H
	Article 6 – Scheduled air services	N/a	A/H/M	N/a	A/H

9.14.2	CHAPTER 2 – FLIGHT OVER TERRITORY OF CONTRACTING STATES	PPL	CPL	IR	ATPL
	Article 7 – Sabotage	N/a	A/H/M	N/a	A/H
	Article 10 – Landing at custom airports	N/a	A/H/M	N/a	A/H
	Article 11 – Applicability of air regulations	A/H/M	A/H/M	N/a	A/H
	Article 12 – Rules of the air	A/H/M	A/H/M	N/a	A/H
	Article 16 – Search of aircraft	N/a	A/H	N/a	A/H

9.14.3	CHAPTER 4 – MEASURE TO FACILITATE AIR NAVIGATION	PPL	CPL	IR	ATPL
	Article 24 – Customs duty	N/a	A/H	N/a	A/H

9.14.4	CHAPTER 5 – CONDITIONS TO BE FULFILLED WITH RESPECT TO AIRCRAFT	PPL	CPL	IR	ATPL
	Article 29 – Documents to be carried in aircraft	A/H/M	A/H/M	N/a	A/H
	Article 31 – Certificates of airworthiness	A/H/M	A/H/M	N/a	A/H
	Article 32 – Licenses of personnel	A/H/M	A/H/M	N/a	A/H
	Article 33 – Recognition of certificates and licenses	A/H/M	A/H/M	N/a	A/H
	Article 35 – Cargo restrictions	N/a	A/H/M	N/a	A/H
	Article 36 – Photographic apparatus	N/a	A/H/M	N/a	A/H

9.14.5	CHAPTER 6 – INTERNATIONAL STANDARDS RECOMMENDED PRACTICES	PPL	CPL	IR	ATPL
	Article 37 – Adoption of international standards and procedures	A/H	A/H	N/a	A/H
	Article 38 – Departures from international standards and procedures	A/H	A/H	N/a	A/H
	Article 40 – Validity of endorsed certificates and licenses	A/H	A/H	N/a	A/H

9.14.6	CHAPTER 7 – THE ORGANISATION	PPL	CPL	IR	ATPL
	Article 43 – Name and composition	A/H	A/H	N/a	A/H
	Article 44 – Objectives	A/H	A/H	N/a	A/H

11. HUMAN PERFORMANCE

11.1	BASIC CONCEPTS	PPL	CPL	IR	ATPL
	Metabolism	A/H/M	A/H/M	N/a	A/H
	Oxygen requirements of tissues	A/H/M	A/H/M	N/a	A/H
	Composition of the atmosphere	A/H/M	A/H/M	N/a	A/H
	The gas laws	A/H/M	A/H/M	N/a	A/H
	The respiratory system and circulation of the blood	A/H/M	A/H/M	N/a	A/H

11.1	BASIC CONCEPTS	PPL	CPL	IR	ATPL
	Interrelationship of respiration and circulation	A/H/M	A/H/M	N/a	A/H
	Composition and function of the blood	A/H/M	A/H/M	N/a	A/H
	Blood pressure	A/H/M	A/H/M	N/a	A/H
	Control of blood pressure	A/H/M	A/H/M	N/a	A/H
	Hypotension and hypertension	A/H/M	A/H/M	N/a	A/H
	Homodynamic effects of acceleration	A/H/M	A/H/M	N/a	A/H
	Functional anatomy of the respiratory system	A/H/M	A/H/M	N/a	A/H
	Ventilation of the alveolar space, respiratory control	A/H/M	A/H/M	N/a	A/H
	Hypoxia	A/H/M	A/H/M	N/a	A/H
	Definition and cause of hypoxia	A/H/M	A/H/M	N/a	A/H
	Symptoms of oxygen deficiency and treatment	A/H/M	A/H/M	N/a	A/H
	Time of useful consciousness	A/H/M	A/H/M	N/a	A/H
	Hyperventilation	A/H/M	A/H/M	N/a	A/H
	Symptoms and treatment	A/H/M	A/H/M	N/a	A/H
	The pressure cabin	A/H/M	A/H/M	N/a	A/H
	Rapid decompression, effects and counter measures	A/H/M	A/H/M	N/a	A/H
	Entrapped gases, barotraumas	A/H/M	A/H/M	N/a	A/H

11.2	HUMAN INFORMATION PROCESSING	PPL	CPL	IR	ATPL
	The General System	A/H/M	A/H/M	N/a	A/H
	Central and peripheral nervous system	A/H/M	A/H/M	N/a	A/H
	Sensory threshold, sensitivity, adaptation, habituation	A/H/M	A/H/M	N/a	A/H
	Reflexes and biological control systems	A/H/M	A/H/M	N/a	A/H
	Mental set, attention (selective, divided, failure)	A/H/M	A/H/M	N/a	A/H
	Channel capacity, filtering	A/H/M	A/H/M	N/a	A/H
	Mechanisms of perception, constancies, selective perception	A/H/M	A/H/M	N/a	A/H
	The Senses	A/H/M	A/H/M	N/a	A/H
	Vision	A/H/M	A/H/M	N/a	A/H
	Functional anatomy of the eyes	A/H/M	A/H/M	N/a	A/H
	Physiology of the visual system	A/H/M	A/H/M	N/a	A/H
	Visual acuity, refraction and refractive errors, presbyopia	N/a	N/a	N/a	A/H
	The visual field, scanning of the environment	N/a	N/a	N/a	A/H
	Binocular vision	N/a	N/a	N/a	A/H
	The intraocular pressure, glaucoma	N/a	N/a	N/a	A/H
	Hypoxia and vision	N/a	N/a	N/a	A/H
	Night vision (dark adaptation)	N/a	N/a	N/a	A/H
	Defective colour vision	N/a	N/a	N/a	A/H
	Hearing	N/a	N/a	N/a	A/H
	Functional anatomy of the ear	N/a	N/a	N/a	A/H
	Physiology of hearing	N/a	N/a	N/a	A/H
	Hearing loss (perceptive, conductive)	N/a	N/a	N/a	A/H
	Flight related hazards to hearing, noise related hearing loss barotraumas	N/a	N/a	N/a	A/H

11.2	HUMAN INFORMATION PROCESSING	PPL	CPL	IR	ATPL
	Equilibrium	N/a	N/a	N/a	A/H
	Functional anatomy and physiology	N/a	N/a	N/a	A/H
	Detection of rotary and linear acceleration	N/a	N/a	N/a	A/H
	The subjective vertical	N/a	N/a	N/a	A/H
	Motion sickness	N/a	N/a	N/a	A/H
	Integration of sensory inputs, spatial disorientation and illusions	N/a	N/a	N/a	A/H
	Basic concepts and definitions	N/a	N/a	N/a	A/H
	Categories of disorientation	N/a	N/a	N/a	A/H
	Flight circumstances	N/a	N/a	N/a	A/H
	Vertigo, Coriolis effects, pressure, vertigo, flicker vertigo	N/a	N/a	N/a	A/H
	Visual illusions (the leans, approach and landing problems)	N/a	N/a	N/a	A/H
	Effects of aircraft acceleration	N/a	N/a	N/a	A/H
	Memory	N/a	N/a	N/a	A/H
	Functional description	N/a	N/a	N/a	A/H
	Information storage and recall	N/a	N/a	N/a	A/H
	Short term memory	N/a	N/a	N/a	A/H
	Long term memory	N/a	N/a	N/a	A/H
	Working memory	N/a	N/a	N/a	A/H
	Effects of stress and time delay	N/a	N/a	N/a	A/H

11.3	HUMAN BEHAVIOUR	PPL	CPL	IR	ATPL
	General concepts	A/H/M	A/H/M	N/a	A/H
	Personality	A/H/M	A/H/M	N/a	A/H
	Characteristics	A/H/M	A/H/M	N/a	A/H
	Individual differences in personality	A/H/M	A/H/M	N/a	A/H
	Self concept	A/H/M	A/H/M	N/a	A/H
	Attitude development	A/H/M	A/H/M	N/a	A/H
	Cognitive dissonance	A/H/M	A/H/M	N/a	A/H
	Behaviour and skills	A/H/M	A/H/M	N/a	A/H
	Drives	A/H/M	A/H/M	N/a	A/H
	Learning	A/H/M	A/H/M	N/a	A/H
	Motivation and performance	A/H/M	A/H/M	N/a	A/H
	Human error and reliability	A/H/M	A/H/M	N/a	A/H
	Human error model	N/a	A/H/M	N/a	A/H
	Types of errors	N/a	A/H/M	N/a	A/H
	Prevention and counter measures	N/a	A/H/M	N/a	A/H
	Reliability of human behaviour	N/a	A/H/M	N/a	A/H
	Errors induced by external factors (ergonomics, organisations)	N/a	A/H/M	N/a	A/H
	Identification of hazardous altitudes	N/a	A/H/M	N/a	A/H
	Working in an automated cockpit	N/a	A/H/M	N/a	A/H
	Advantages / disadvantages	N/a	A/H/M	N/a	A/H
	Coping behaviour	N/a	A/H/M	N/a	A/H
		N/a	A/H/M	N/a	
	Cockpit management	N/a	A/H/M	N/a	A/H
	Crew co-ordination	N/a	A/H/M	N/a	A/H
	Distribution of responsibilities	N/a	A/H/M	N/a	A/H
	Work with a crew concept	N/a	A/H/M	N/a	A/H

11.3	HUMAN BEHAVIOUR	PPL	CPL	IR	ATPL
	Crew co-operation	N/a	A/H/M	N/a	A/H
	Small group dynamics (norms, atmosphere, pressure, communication, structure)	N/a	A/H/M	N/a	A/H
	Conflict management	N/a	A/H/M	N/a	A/H
	Leadership, style of management	N/a	A/H/M	N/a	A/H
	Concern for performance	N/a	A/H/M	N/a	A/H
	Concern for people	N/a	A/H/M	N/a	A/H
	Democratic versus autocratic style	N/a	A/H/M	N/a	A/H
	Encouraging inputs and feedback	N/a	A/H/M	N/a	A/H
	Optimising of crew performance in flight	N/a	A/H/M	N/a	A/H
	Correcting crew co-ordination deficiencies	N/a	A/H/M	N/a	A/H
	Handling/dealing with crew-incapacitation	N/a	A/H/M	N/a	A/H
	Communication	N/a	A/H/M	N/a	A/H
	Verbal and non-verbal communication	N/a	A/H/M	N/a	A/H
	One- and two-way communication	N/a	A/H/M	N/a	A/H
	Effects of different communication styles	N/a	A/H/M	N/a	A/H
	Miscommunication (including cultural differences)	N/a	A/H/M	N/a	A/H
	Judgements and decision making	N/a	A / H	N/a	A/H
	Pilot judgement concepts	N/a	A / H	N/a	A/H
	Types of judgement	N/a	A / H	N/a	A/H
	Motor skills and human factors	N/a	A / H	N/a	A/H
	Aeronautical decision making	N/a	A / H	N/a	A/H
	Decision making concepts	N/a	A / H	N/a	A/H
	Pilot responsibilities	N/a	A / H	N/a	A/H
	Behavioural aspects	N/a	A / H	N/a	A/H
	Identification of hazardous attitudes	N/a	A / H	N/a	A/H
	Physical factors	N/a	A / H	N/a	A/H
	Physiological factors	N/a	A / H	N/a	A/H
	Social influences and interface between people	N/a	A / H	N/a	A/H
	Pilot judgement awareness	N/a	A / H	N/a	A/H
	Risk assessment	N/a	A / H	N/a	A/H
	Cockpit stress management	N/a	A / H	N/a	A/H
	Applying decision making concepts	N/a	A / H	N/a	A/H
	Practical application	N/a	A / H	N/a	A/H
	Managing resources	N/a	A / H	N/a	A/H
	Safety awareness	N/a	A / H	N/a	A/H

11.4	FLYING AND HEALTH	PPL	CPL	IR	ATPL
	The high-altitude environment (ozone, radiation, humidity)	A/H/M	A/H/M	N/a	A/H
	Physiological and mental fitness	A/H/M	A/H/M	N/a	A/H
		N/a	A / H	N/a	A/H
	Incapacitation	N/a	A/H/M	N/a	A/H
	Causes and symptoms	N/a	A/H/M	N/a	A/H
	Gastro-intestinal	N/a	A/H/M	N/a	A/H
	Cardio-vascular	N/a	A/H/M	N/a	A/H
	Side effects of drugs and medication	A/H/M	A/H/M	N/a	A/H
	Migraine	A/H/M	A/H/M	N/a	A/H
	Epilepsy	A/H/M	A/H/M	N/a	A/H
	Brain disorders	N/a	A/H/M	N/a	A/H

11.4	FLYING AND HEALTH	PPL	CPL	IR	ATPL
	Recognition: insidious and sudden incapacitation	N/a	A/H/M	N/a	A/H
	Procedures for dealing with incapacitation	N/a	A/H/M	N/a	A/H
	Intoxication	N/a	A/H/M	N/a	A/H
	Tobacco	N/a	A/H/M	N/a	A/H
	Alcohol	N/a	A/H/M	N/a	A/H
	Drugs and self-medication	N/a	A/H/M	N/a	A/H
	Various toxic materials	N/a	A/H/M	N/a	A/H
	Body rhythm disturbances	N/a	A/H/M	N/a	A/H
	The biological clock	N/a	A/H/M	N/a	A/H
	Disturbances of circadian rhythms	N/a	A/H/M	N/a	A/H
	Causes (shift work, time-zone crossing)	N/a	A/H/M	N/a	A/H
	Symptoms	N/a	A/H/M	N/a	A/H
	Treatment	N/a	A/H/M	N/a	A/H
	Sleep	N/a	A/H/M	N/a	A/H
	Functions	N/a	A/H/M	N/a	A/H
	Patterns	N/a	A/H/M	N/a	A/H
	Effects of disturbances and treatment	N/a	A/H/M	N/a	A/H
	Fatigue	N/a	A/H/M	N/a	A/H
	Definition	N/a	A/H/M	N/a	A/H
	Causes	N/a	A/H/M	N/a	A/H
	Types and symptoms	N/a	A/H/M	N/a	A/H
	Prevention and treatment	N/a	A/H/M	N/a	A/H
	Stress and anxiety	A/H/M	A/H/M	N/a	A/H
	Definition of stress	A/H/M	A/H/M	N/a	A/H
	Stress components	A/H/M	A/H/M	N/a	A/H
	Causes, stressors	N/a	A/H/M	N/a	A/H
	Coping behaviour	N/a	A/H/M	N/a	A/H
	Identifying and reducing stress	N/a	A/H/M	N/a	A/H
	Life stress management	N/a	A/H/M	N/a	A/H
	Effects on performance	N/a	A/H/M	N/a	A/H
	Anxiety	N/a	A/H/M	N/a	A/H
	Defence mechanism	N/a	A/H/M	N/a	A/H
	Effects of anxiety and defence mechanism	N/a	A/H/M	N/a	A/H
	General health aspects	N/a	A/H/M	N/a	A/H
	Common minor ailments (colds, influenza, gastro-intestinal upsets)	N/a	A/H/M	N/a	A/H
	Tropical climates, risk, regulatory aspects	N/a	A/H/M	N/a	A/H
	Personal hygiene; oral, external, internal hygiene	A/H/M	A/H/M	N/a	A/H
	Diabetes	A/H/M	A/H/M	N/a	A/H
	Hyper / hypotension	A/H/M	A/H/M	N/a	A/H
	Obesity, lack of exercise	A/H/M	A/H/M	N/a	A/H
	Epidemic diseases	N/a	A/H/M	N/a	A/H
	Body temperature	N/a	A/H/M	N/a	A/H
11.5	HYGIENE OF SURVIVAL	PPL	CPL	IR	ATPL
	Survival in extreme climatological conditions	A/H/M	A/H/M	N/a	A/H
	Tropical	A/H/M	A/H/M	N/a	A/H
	Arctic	A/H/M	A/H/M	N/a	A/H
	Desert	A/H/M	A/H/M	N/a	A/H
	Jungle	A/H/M	A/H/M	N/a	A/H

11.5	HYGIENE OF SURVIVAL	PPL	CPL	IR	ATPL
	High seas	A/H/M	A/H/M	N/a	A/H

61.02.2 APPLICATION FOR STUDENT PILOT LICENSE

1. Form of application

The form in which the application for the student pilot license is made is form MZ 61-01, which is available from the Director General.

61.02.3 ISSUING OF STUDENT PILOT LICENSE

1. Form of application

The form in which the student pilot license is issued is determined by the Director General.

61.02.4 TRAINING (SPL)

1. Aim of training course

The aim of the training course is to train a student pilot to the level of knowledge and understanding necessary to obtain a pilot license. The course is also designed to ensure that the applicant has sufficient understanding of the MOZAMBICAN Civil Aviation Regulations, 1999, and procedures so as to be able to fly solo without endangering the public.

The training course comprises -

- (1) a theoretical knowledge course; and
- (2) practical instruction in the use of radio-telephony apparatus.

2. Theoretical knowledge course

2.1 Contents and duration

The theoretical knowledge course must consist of at least 10 hours of instruction, applicable to the type of aircraft in respect of which application for a pilot license will be made, and in the form of lectures, classroom work, slide / tape presentation and computer-based training, where applicable.

The 10 hours of instruction should preferably be divided as follows:

Subject	Hours
Air law	2
Aircraft general knowledge	2
Operational procedures	2
Communication	4

These hours are credited towards the hours required for a private pilot license (aeroplane), a private pilot license (helicopter), a microlight aeroplane pilot license, a glider pilot license, an airship pilot license or a gyroplane pilot license.

2.2. Theoretical knowledge course syllabus

2.1 Air Law and ATC Procedures

2.1.1 MOZ-CAR

- (1) Part 61 - Pilot licensing
 - (a) General rules
 - (i) Validity of licenses and ratings;
 - (ii) medical fitness;

- (iii) competency;
 - (iv) logbooks;
 - (v) retesting after failure;
 - (vi) suspension and cancellation of license and appeal; and
 - (vii) crediting of flight time.
- (b) General rules concerning pilot licenses and ratings
 - (i) Types of pilot licenses;
 - (ii) types of ratings;
 - (iii) circumstances in which type ratings are required;
 - (iv) circumstances in which an instrument rating is required;
 - (v) circumstances in which a night rating is required; and
 - (vi) circumstances in which authorisation to conduct flight instruction, is required.
- (2) Part 67 - Medical requirements
 - (a) Medical fitness; and
 - (b) decrease of medical fitness.
- (3) Part 21 - Certification procedures for products and parts
 - (a) Applicability.
- (4) Part 91 - General operating and flight rules
 - (a) Applicability; and
 - (b) rules of the air
 - (i) applicability;
 - (ii) general rules;
 - (iii) visual flight rules; and
 - (iv) signals.
- (5) Part 172 - Airspace and air traffic services
 - (a) General
 - (i) Definitions;
 - (ii) objectives of air traffic services;
 - (iii) classification of airspace;
 - (iv) flight information regions, control areas and control zones;
 - (v) air traffic control services;
 - (vi) flight information services;
 - (vii) alerting service; and
 - (viii) visual meteorological conditions.
 - (b) Area control service
 - (i) Separation of controlled traffic in the various classes of airspace;
 - (ii) pilot's responsibility to maintain separation in VMC;

- (iii) emergency and communications failure procedure by the pilot;
and
- (iv) interception of civil aircraft.

(c) Approach control service

- (i) Departing and arriving aircraft procedures in VMC.

(d) Aerodrome control service

- (i) Function of aerodrome control towers;
- (ii) VFR operations;
- (iii) traffic and circuit procedures;
- (iv) information to aircraft; and
- (v) control of aerodrome traffic.

(e) Flight information and alerting service

- (i) Air traffic advisory service; and
- (ii) objective and basic principles.

8. International Civil Aviation Organization Annexes and Documents

(1) Annex 1 - Personnel licensing

- (a) Applicability.

(2) Annex 8 - Airworthiness of aircraft

- (a) Applicability.

(3) Annex 2- Rules of the air

- (a) Applicability.

(4) ICAO Document 4444 - Rules of the air and air traffic services

- (a) Definitions;
- (b) ATS operating practices;
- (c) flight plan clearance and information;
- (d) control of air traffic flow;
- (e) altimeter setting procedure;
- (f) wake turbulence information;
- (g) meteorological information; and
- (h) air reports.

2.2 Aircraft general knowledge

2.2.1 Airframe

- (1) Airframe structure
 - (a) Components;
 - (b) fuselage, wings, tail plane and fin;
 - (c) primary flying controls;
 - (d) trim and flap/slat systems; and
 - (e) landing gear
 - (i) nose wheel, including steering;
 - (ii) tyres, condition; and
 - (iii) braking systems and precautions in use.

2.2.2 Powerplant

- (1) Engines - general
 - (a) Principles of the four-stroke;
 - (b) internal-combustion engine; and
 - (c) basic construction.
- (2) Engine cooling
 - (a) air cooling.
- (3) Engine lubrication
 - (a) Function and methods of lubrication.
- (4) Ignition systems
 - (a) Principles of magneto ignition.
- (5) Carburetor
- (6) Aero engine fuel
 - (a) Classification of fuels
 - (i) grades and identification by colour; and
 - (ii) quality requirements;
 - (b) inspection for contamination
 - (i) use of fuel strainers and drains.

- (7) Fuel systems
 - (a) Fuel tanks and supply lines; and
 - (b) system management.
- (8) Propellers
 - (a) Engine handling;
 - (b) starting procedures and precautions;
 - (c) recognition of malfunctions;
 - (d) warming up, power and system checks;
 - (e) power limitations;
 - (f) avoidance of rapid power changes; and
 - (g) use of mixture control.

2.2.3 Systems

- (1) Electrical system
 - (a) Installation and operation of alternators/generators.
- (2) Vacuum system
 - (a) Components.

2.2.4 Instruments

- (1) Pitot/static system.
- (2) Pilot tube, function.
- (3) Altimeter
 - (a) Principles of operation and construction;
 - (b) function of the sub-scale; and
 - (c) pilot's serviceability checks
- (4) Airspeed indicator
 - (a) Function; and
 - (b) Pilot's serviceability checks.
- (5) Vertical speed indicator
 - (a) Function; and
 - (b) pilot's serviceability checks.

- (6) Turn indicator
 - (a) Purpose and function; and
 - (b) pilot's serviceability checks.
- (7) Attitude indicator
 - (a) Purpose and function; and
 - (b) pilot's serviceability checks.
- (8) Heading indicator
 - (a) Purpose and function; and
 - (b) pilot's serviceability checks.
- (9) Magnetic compass
 - (a) Construction and function; and
 - (b) pilot's serviceability checks.
- (10) Engine instruments
 - (a) Principles, presentation and operational use of -
 - (i) oil temperature gauge;
 - (ii) oil pressure gauge;
 - (iii) fuel quantity gauge(s); and
 - (iv) tachometer.
- (11) Other instruments
 - (a) Principles, presentation and operational use of -
 - (i) vacuum gauge; and
 - (ii) voltmeter and ammeter.

2.2.5 Airworthiness

- (1) Certificate of airworthiness to be in force.

2.3 Operational procedures

2.3.1 General operating and flight rules - Part 91

- (1) Noise abatement
 - (a) General procedures; and
 - (b) application to take-off and landing.
- (2) Contravention of aviation regulations

- (a) Offences; and
 - (b) penalties.
- (3) General flight safety.
- (4) Aircraft
 - (a) Seat adjustment and security;
 - (b) harnesses and seat belts;
 - (c) emergency equipment and its use
 - (i) fire extinguisher;
 - (ii) engine/cabin fires;
 - (iii) de-icing systems; and
 - (iv) survival equipment, life jackets and life rafts;
 - (d) carbon monoxide poisoning;
 - (e) refuelling precautions; and
 - (f) flammable goods/pressurised containers.
- (5) Operational
 - (a) Wake turbulence;
 - (b) aquaplaning;
 - (c) windshear, take-off, approach and landing;
 - (d) passenger briefings;
 - (e) emergency exits; and
 - (f) evacuation from the aircraft
 - (i) forced landings;
 - (ii) gear-up landing; and
 - (iii) ditching.

2.4 Communications (Radiotelephony)

2.4.1 Use of AIP and frequency selection.

2.4.2 Microphone technique.

2.4.3 Phonetic alphabet.

2.4.4 Station/aircraft call signs/abbreviations.

2.4.5 Transmission technique

- (1) Use of standard words and phrases.
- (2) Listening out.
- (3) Required "read back" instructions.

2.4.6 Departure procedures

- (1) Radio checks.
- (2) Taxi instructions.
- (3) Holding on ground.
- (4) Departure clearance.

2.4.7 En route procedures

- (1) Frequency changing.
- (2) Position, altitude/flight level reporting.
- (3) Flight information service
 - (a) Weather information; and
 - (b) weather reporting.
- (4) Procedures to obtain bearings, headings and position.
- (5) Procedural phraseology.
- (6) Height/range coverage

2.4.8 Arrival and traffic pattern procedures

- (1) Arrival clearance.
- (2) Calls and ATC instructions during the -
 - (a) circuit;
 - (b) approach and landing; and
 - (c) vacating runway.

2.4.9 Communications failure

- (1) Action to be taken
 - (a) Alternate frequency; and
 - (b) serviceability check, including microphone and headphones.

- (2) In-flight procedures according to type of airspace.

2.4.10 Distress and urgency procedures

- (1) Distress (Mayday), definition and when to use.
- (2) Frequencies to use.
- (3) Contents of Mayday message.
- (4) Urgency (Pan), definition and when to use.
- (5) Frequencies to use.
- (6) Relay of messages.
- (7) Maintenance of silence when distress/ urgency calls heard.
- (8) Cancellation of distress/urgency.

3. Practical training course

The practical training course must consist of sufficient instruction to ensure that a student pilot is able to operate the radiotelephony apparatus fitted to a training aircraft in the circuit and for use to and from the general flying area.

61.02.5 THEORETICAL KNOWLEDGE EXAMINATION (SPL)

1. Contents

The holder of a student pilot license must pass a written theoretical knowledge examination in Air Law, as applicable to student pilots, and aircraft type technical, prior to his or her first solo cross-country flight.

2. Conducting of theoretical knowledge examination

- (1) The written theoretical knowledge examination must be conducted by -
 - (a) in the case of an aeroplane, a Category A, Grade I or Grade II aeroplane flight instructor;
 - (b) in the case of a helicopter, a Category B, Grade I or Grade II helicopter flight instructor;
 - (c) in the case of a microlight aeroplane, a Category C, microlight aeroplane flight instructor.
- (2) The flight instructor referred to in subparagraph (1)(a)(b) or (c) may not be the flight instructor from whom the applicant received his or her theoretical training.

3. Duties of Aviation Training Organisation

- (1) The aviation training organisation may publish -
 - (a) the dates on which examinations are to be written;
 - (b) the latest date by which applications for each such examination are to reach the aviation training organisation;
 - (c) the format and duration of each examination; and
 - (d) the fees payable for such examinations.
- (2) The entry fee paid for any examination may, upon request by the candidate, be refunded or transferred to a subsequent examination: Provided that an acceptable reason for such request is furnished.

4. Admission to examinations

- (1) Admission to a written theoretical examination is subject to the following conditions:
 - (a) An application for admission to the examination must be made on the relevant application form;
 - (b) the application must be accompanied by the entry fee;

- (c) the application and fee must be submitted to the relevant aviation training organisation, to reach its office on or before the closing date published for such examination;
- (d) the rules and instructions determined by the relevant aviation training organisation for such examination, must be complied with, which rules and instructions must be supplied to a candidate upon his or her admission for a particular examination; and
- (e) a candidate must subject himself or herself to disqualification from future examinations for a period not exceeding 12 months if the rules and instructions referred to in subparagraph (4) are contravened and the candidate will be deemed to have failed the examination in which such contravention occurred.

5. Remarking of examination scripts

- (1) A candidate who has failed one or more examination papers with a mark between 66% and 69%, may on payment of the fee determined by the aviation training organisation, apply for the remarking of the script or scripts concerned.
- (2) Application for the remarking of an examination script or scripts must be made in writing to the aviation training organisation, and such application, accompanied by the fee, must reach the aviation training organisation not later than one month after the examination results were published.
- (3) The decision of the aviation training organisation on any remarked examination script, is final.

61.02.8 PRIVILEGES AND LIMITATIONS OF STUDENT PILOT LICENSE

1. Sequence of flights

A student pilot may not fly, unless authorisation is granted by his/her instructor in his or her presence, for the following sequence of flight:

- (a) In the case of a student pilot license (aeroplane), the solo cross-country flight and cross-country flight test referred to in paragraph 1.2 of CATS 61.03.5; or
- (b) in the case of a student pilot license (helicopter), the solo cross-country flight and cross-country flight test referred to in exercise 30(b) and (c) of CATS 61.04.5.

2. Exercise of the syllabus

A student pilot may not fly, unless a flight instructor is the pilot-in-command, the low-flying exercise –

- (a) referred to in exercise 19B in paragraph 5 of CATS 61.03.3, in the case of a student pilot license (aeroplane); or
- (b) referred to in exercise 19B in paragraph 5 of CATS 61.04.3, in the case of a student pilot license (helicopter).

61.03.3 TRAINING (PPL-A)

1. Form of application**1.1 Aim of training course**

The aim of the training course is to train a candidate to the level of proficiency required for the issuing of the private pilot license (aeroplane).

1.2. Duration, contents and requirements of training course

The duration of the course must not exceed 24 months.

The course comprises a -

- (1) theoretical knowledge course to private pilot license level; and
- (2) practical training course.

2. Theoretical knowledge course

The theoretical knowledge course must comprise at least 100 hours of instruction, of which 40 hours may be monitored self-study by means of assignments. This instruction must include classroom work, interactive video, slide tape presentation, computer-based training and learning carrels, where applicable.

The 100 hours of instruction should preferably be divided as follows:

Subject	Hours
Air law and ATC procedures	10
Aircraft general knowledge	10
Flight performance and planning	20
Navigation	12
Meteorology	7
Operational procedures	10
Principles of flight	6
Human performance and limitations	10
Communications	10

3. Theoretical knowledge course syllabus

The theoretical knowledge course syllabus for Private Pilot Aeroplane Pilots is in the Generic Theoretical Knowledge Course Syllabus contained in Technical Standard 61.01.30.

4. Practical training course**4.1 Exercise 1: Familiarisation with the aeroplane**

- (1) Characteristics of the aeroplane;

- (2) flight deck layout;
- (3) systems;
- (4) check lists, drills, controls; and
- (5) emergency drills, consisting of -
 - (a) action in the event of fire on the ground and in the air;
 - (b) cabin and electrical system failures; and
 - (c) escape drills, location and use of emergency equipment and exits.

4.2 Exercise 2: Preparation for and action after flight

- (1) Flight authorisation and aeroplane acceptance;
- (2) serviceability documents;
- (3) equipment required, maps, etc.;
- (4) external checks;
- (5) internal checks;
- (6) seat, harness and controls adjustments;
- (7) starting and warm up checks;
- (8) power checks;
- (9) running down and switching off engine;
- (10) parking, security and picketing; and
- (11) completion of authorisation sheet and serviceability documents.

4.3 Exercise 3: Air experience

The aim of this sequence is to instil confidence in a pupil who has previously flown very little or not at all, as well as to impart knowledge.

4.4 Exercise 4: Effect of controls

- (1) Primary effects when laterally level and when banked;
- (2) further effects of aileron and rudder effects of –
 - (a) airspeed;
 - (b) slipstream;
 - (c) power;

- (d) trimming controls;
- (e) flaps; and
- (f) other controls, as applicable;
- (3) operation of -
 - (a) mixture control;
 - (b) carburettor heat; and
 - (c) cabin heating/ventilation;
- (4) airmanship.

4.5 Exercise 5: Taxiing

- (1) Pre-taxi checks;
- (2) starting, control of speed and stopping;
- (3) engine handling;
- (4) control of direction and turning;
- (5) turning in confined spaces;
- (6) parking area procedure and precautions;
- (7) effects of wind and use of flying controls;
- (8) effects of ground surface;
- (9) freedom of rudder movement;
- (10) marshalling signals;
- (11) instrument checks;
- (12) air traffic control procedures;
- (13) airmanship; and
- (14) emergencies (brake and steering failure).

4.6 Exercise 6: Straight and level flight

- (1) At normal cruising power, attaining and maintaining straight and level flight;
- (2) demonstration of inherent stability;
- (3) control in pitch, including use of trim;

- (4) lateral level, direction and balance, trim;
- (5) at selected airspeeds (use of power);
- (6) during speed and configuration changes;
- (7) use of instruments for precision; and
- (8) airmanship.

4.7 Exercise 7: Climbing

- (1) Entry, maintaining the normal and maximum
- (2) levelling off at selected altitudes;
- (3) en route climb (cruise climb);
- (4) maximum angle of climb;
- (5) use of instruments for precision; and
- (6) airmanship.

4.8 Exercise 8: Descending

- (1) Entry, maintaining and levelling off;
- (2) levelling off at selected altitudes;
- (3) glide, powered and cruise descent (including effect of power and airspeed);
- (4) use of instruments for precision flight;
- (5) side slipping; and
- (6) airmanship.

4.9 Exercise 9: Slow flight

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 should this situation occur.

- (1) rate climb and levelling off;
- (2) Safety checks;
- (3) introduction to slow flight;
- (4) controlled flight at clean stall speed plus five knots;
- (5) controlled flight at flaps down stall speed plus five knots;

- (6) application of full power with correct attitude to achieve climb speed;
and
- (7) airmanship.

4.10 Exercise 10: Stalling

- (1) Airmanship;
- (2) safety checks;
- (3) symptoms;
- (4) recognition;
- (5) clean stall and recovery without power and with power;
- (6) recovery when a wing drops; and
- (7) approach to stall in the approach and in the landing configurations,
with power, recovery at the incipient stage.

4.11 Exercise 11: Turning

- (1) Entry and maintaining medium level turns;
- (2) resuming straight flight;
- (3) faults in the turn - balance;
- (4) climbing turns;
- (5) descending turns;
- (6) turns onto selected headings, use of gyro heading indicator and
compass;
- (7) use of instruments for precision; and
- (8) airmanship.

4.12 Exercise 12: Spin avoidance

- (1) Airmanship;
- (2) stalling and recovery at the incipient spin stage (stall with excessive
wing drop, about 45°);
- (3) instructor induced distractions during the stall; and
- (4) where applicable, full spin recovery.

Notes:

1. At least two hours of stall awareness and spin avoidance flight training must be completed during the course.
2. Training must include consideration of manoeuvre limitations and the need to refer to the aeroplane manual and mass and balance calculations.

4.13 Exercise 13: Take-off and climb to downwind position

- (1) Pre-take-off checks;
- (2) into wind take-off;
- (3) safeguarding the nose wheel;
- (4) crosswind take-off;
- (5) drills during and after take-off;
- (6) short take-off and soft field procedure/techniques including performance calculations;
- (7) noise abatement procedures;
- (8) airmanship;
- (9) abandoned take-off; and
- (10) engine failure after take-off.

4.14 Exercise 14: Circuit, approach and landing

- (1) Circuit procedures, downwind, base leg;
- (2) powered approach and landing;
- (3) safeguarding the nose wheel;
- (4) effect of wind on approach and touchdown speeds,
- (5) use of flaps;
- (6) crosswind approach and landing;
- (7) Glide approach and landing;
- (8) short landing and soft field procedures/techniques; flapless approach and landing;
- (9) missed approach/go around;
- (10) noise abatement procedures;

- (11) airmanship;
- (12) missed landing/go-around; and
- (13) missed approach.

4.15 Exercise 15: First solo

Before flying solo a pupil must, in addition to being proficient in exercises 1 to 14, be able to make a reasonable effort at the exercise of "Elementary forced landing", i.e. the ability to execute and approach on a large open space. He or she must also have completed a minimum of six hours of dual flight instruction.

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

- (1) Procedures for leaving and rejoining the circuit;
- (2) the local area, restrictions and map reading;
- (3) use of radio aids for homing;
- (4) turns using magnetic compass, compass errors; and
- (5) airmanship.

4.16 Exercise 16: Advanced turning

- (1) Steep turns (45°), level and descending;
- (2) stalling in the turn and recovery;
- (3) recoveries from unusual attitudes, including spiral dives; and
- (4) airmanship.

4.17 Exercise 17: Forced landing without power

- (1) Forced landing procedure;
- (2) choice of landing area, provision for change of plan;
- (3) gliding distance;
- (4) descent plan;
- (5) key positions;
- (6) engine cooling;
- (7) engine failure checks;
- (8) use of radio, Mayday call;

- (9) base leg;
- (10) final approach;
- (11) landing;
- (12) actions after landing; and
- (13) airmanship.

4.18 Exercise 18: Precautionary landing with power

- (1) Full procedure away from aerodrome to break-off height;
- (2) occasions necessitating;
- (3) in-flight conditions;
- (4) landing area selection -
 - (a) Normal aerodrome;
 - (b) disused aerodrome; and
 - (c) ordinary field;
- (5) circuit and approach;
- (6) PAN call;
- (7) actions after landing; and
- (8) airmanship.

4.19 Exercise 19: Navigation

4.19.1 Exercise 19A: Navigation

- (1) Flight planning
 - (a) Weather forecast and actuals.
 - (b) Map selection and preparation
 - (i) Choice of route;
 - (ii) controlled airspace;
 - (iii) danger, prohibited and restricted areas; and
 - (iv) safety altitudes.
 - (c) Calculations

- (i) Magnetic heading(s) and time(s) en route;
 - (ii) fuel consumption;
 - (iii) mass and balance; and
 - (iv) mass and performance.
- (d) Flight information
 - (i) NOTAM etc.
 - (ii) radio frequencies; and
 - (iii) selection of alternate aerodromes.
- (e) Aeroplane documentation.
- (f) Notification of the flight
 - (i) Pre-flight administrative procedures; and
 - (ii) flight plan form.
- (2) Departure
 - (a) Organisation of flight deck workload.
 - (b) Departure procedures
 - (i) Altimeter settings;
 - (ii) ATC liaison in controlled/regulated airspace;
 - (iii) setting heading procedure; and
 - (iv) noting of ETA.
 - (c) Maintenance of altitude and heading.
 - (d) Revisions of ETA and heading.
 - (e) Log keeping.
 - (f) Use of radio.
 - (g) Use of nav aids.
 - (h) Minimum weather conditions for continuation of flight.
 - (i) In-flight decisions.
 - (j) Transiting controlled/regulated airspace.

- (k) Uncertainty of position procedure.
- (l) Lost procedure.
- (3) Arrival
 - (a) Aerodrome joining procedure
 - (i) ATC liaison in controlled/regulated airspace;
 - (ii) altimeter setting;
 - (iii) entering the traffic pattern; and
 - (iv) circuit procedures.
 - (b) Parking.
 - (c) Security of aeroplane.
 - (d) Refuelling
 - (e) Closing of flight plan, if appropriate.
 - (f) Post-flight administrative procedures.

4.19.2 Exercise 19B: Navigation problems at low heights and in reduced visibility

- (1) Actions prior to descending.
- (2) Hazards (e.g. obstacles, other aircraft).
- (3) Difficulties of map reading.
- (4) Effects of wind and turbulence.
- (5) Avoidance of noise sensitive areas.
- (6) Joining the circuit.
- (7) Bad weather circuit and landing.

4.19.3 Exercise 19C: Radio navigation

- (1) Use of VHF Omni Range
 - (a) Availability, AIP, frequencies;
 - (b) selection and identification;
 - (c) omni bearing selector (OMB);
 - (d) to/from indications, orientation;

- (e) course deviation indicator (CDI);
 - (f) determination of radial;
 - (g) intercepting and maintaining a radial;
 - (h) VOR passage; and
 - (i) obtaining a fix from two VOR.
- (2) Use of automatic direction finding equipment (ADF) - non-directional beacons (NDB)
 - (a) Availability, AIP, frequencies;
 - (b) selection and identification;
 - (c) orientation relative to the beacon; and
 - (d) homing.
- (3) Use of VHF direction finding (VHF/DF)
 - (a) Availability, AIP, frequencies;
 - (b) RTF procedures and ATC liaison; and
 - (c) obtaining a QDM and homing.
- (4) Use of en route/terminal radar
 - (a) Availability, AIP;
 - (b) procedures and ATC liaison;
 - (c) pilot's responsibilities; and
 - (d) secondary surveillance radar
 - (i) Transponders;
 - (ii) code selection; and
 - (iii) interrogation and reply.
- (5) Use of distance measuring equipment (DME)
 - (a) Station selection and identification;
 - (b) modes of operation
 - (i) Distance, groundspeed, time to run.

4.20 Exercise 20: Basic instrument flight

- (1) Physiological sensations.
- (2) Instrument appreciation
 - (a) Attitude instrument flight.
- (3) Instrument limitations.
- (4) Airmanship.
- (5) Basic manoeuvres
 - (a) Straight and level at various airspeeds and configurations;
 - (b) climbing and descending;
 - (c) standard rate turns, climbing and descending, onto selected headings; and
 - (d) recoveries from climbing and descending turns.

4.21 Hours for practical training course

Phase 1							
Exercise	SIM	Dual	Solo	Acc Total	VFR	IFR	S/E
Pre-solo (1 to 5)		11	.5	11.5	11.5		11.5
Consolidation		3	2.5	17	5.5		5.5
Advanced exercises (16 - 18)		3	5	25	8		8
Intro to IF (20)		2		27		2	2
Navigation (19)		6	6	39	12		12
Consolidation		1	2	42	3		3
Flight Test / Check (PPL)			3*	45	3		
Totals (45)		26	19		43	2	45

Phase One

This phase encompasses the training required for a private pilot license. The two hour instrument appreciation is provided with a view

to providing the student with the necessary skill to conduct a 180° turn in the event of encountering poor weather during the navigation exercises.

All flight times and simulator times are to be considered as being minimum times. The object of the theoretical knowledge course and the practical training course is to produce proficient crew members.

61.03.4 THEORETICAL KNOWLEDGE EXAMINATION (PPL-A)

1. Contents

An applicant for a private pilot license (aeroplane) must pass a written theoretical knowledge examination on -

- (1) the regulations concerning -
 - (a) conditions relating to flying in Mozambique;
 - (b) licensing requirements applicable to private pilots;
 - (c) logbooks and crediting of flight time;
 - (d) rules of the air, flight rules and visual flight rules;
 - (e) instrument flight rules;
 - (f) ground and light signals for aerodrome traffic;
 - (g) air traffic services;
 - (h) search and rescue;
 - (i) taxi rules;
 - (j) investigation of aircraft accidents;
 - (k) requirements applicable to aircraft flying to or from or over Mozambique on other than scheduled international commercial air transport operations;
 - (l) prohibited and restricted areas;
 - (m) knowledge of the following as set out in the AIP, AIP SUP, NOTAM and AIC currently in force:
 - (i) Aeronautical information services available to pilots;
 - (ii) units of measurement;
 - (iii) meteorological information available to pilots;
 - (iv) names and functions of the various air traffic services units and designations of associated airspace;
 - (v) altimeter setting procedures; and
 - (vi) prohibited, restricted and danger areas;

- (2) the elementary principles of
 - (a) aeronautical charts;
 - (b) meteorological information for cross-country flights;
 - (c) the compass.
- (3) the technical subjects prescribed in paragraph 2.

2. General

- (1) Elementary principles of theory of flight, definition of terms, e.g. airflow, forces on an aeroplane, straight and level flight, relation between speed and angle of attack, angle of incidence, lift/drag ratio, stability, centre of pressure, flaps and slots.
- (2) Properties of air, density, pressure, relationship between pressure, density and temperature, and their effect on aeroplanes and engine performance, isothermal atmosphere, international standard atmosphere.
- (3) The action to be taken in the event of a serious defect or a heavy landing.
- (4) The principles of operation of engines and their component parts and accessories.
- (5) Definition of the terms associated with propellers, function of constant speed, fully feathering and braking propellers.
- (6) Direction of movement of controls, principles of operation and function of trimming, servo or balance tabs and alternative devices.
- (7) Elementary knowledge of electricity and magnetism - definition of terms, e.g. volts, amperes, ohms, watts, alternating and direct current, aircraft batteries - charging and functioning.

3. Conducting of theoretical knowledge examination

- (1) The written theoretical knowledge examination must be conducted by the Director General.
- (2) The Director General may publish
 - (a) the dates on which examinations are to be written;
 - (b) the latest date by which applications for each such examination are to reach the Director General;
 - (c) the format and duration of each examination; and
 - (d) the fees payable for such examinations.
- (3) The entry fee paid for any examination may, upon request by the candidate, be refunded or transferred to a subsequent examination: Provided that an acceptable reason for such request is furnished.

4. Admission to examinations

Admission to a written theoretical examination is subject to the following conditions:

- (1) An application for admission to the examination must be made on the relevant application form;
- (2) the application must be accompanied by the entry fee;
- (3) the application and fee must be submitted to the Director General to reach its office on or before the closing date published for such examination;
- (4) the rules and instructions determined by the Director General for such examination, must be complied with, which rules and instructions must be supplied to a candidate upon his or her admission for a particular examination; and
- (5) a candidate must subject himself or herself to disqualification from future examinations for a period not exceeding 12 months if the rules and instructions referred to in subparagraph (4) are contravened and the candidate will be deemed to have failed the examination in which such contravention occurred.

5. Remarking of examination scripts

- (1) A candidate who has failed one or more examination papers with a mark between 66% and 69%, may on payment of the fee determined by the aviation training organisation, apply for the remarking of the script or scripts concerned.
- (2) Application for the remarking of an examination script or scripts must be made in writing to the aviation training organisation, and such application, accompanied by the fee, must reach the aviation training organisation not later than one month after the examination results were published.
- (3) The decision of the aviation training organisation on any remarked examination script, is final.

61.03.5 SKILL TEST (PPL-A)

1. Procedures and manoeuvres

1.1 An applicant for a private pilot license (aeroplane) must demonstrate the following procedures and maneuvers:

- (1) Pre-flight procedures
 - (a) Aeroplane knowledge.
 - (b) Mass and balance.
 - (c) Performance calculations.
 - (d) Pre-flight inspection.
 - (e) Engine starting.
 - (f) Pre-taxi checks.
 - (g) Taxi.
 - (h) Pre-take off procedures.
 - (i) Radio procedures.
 - (j) Safety considerations.
- (2) Take-off
 - (a) Pre-take off briefing.
 - (b) Short/soft field take-off.
 - (c) Normal take-off.
 - (d) Crosswind take-off.
 - (e) Engine failure during/after take-off.
 - (f) Safety considerations.
- (3) Departure
 - (a) Aerodrome departure procedures.
 - (b) Accuracy of flight.
 - (c) ATC liaison.

- (d) Climbing.
 - (e) Climbing turns.
 - (f) Levelling off.
 - (g) Safety considerations.
- (4) General flying
 - (a) Straight and level.
 - (b) Steep turns (45 bank).
 - (c) Flight at minimum speed.
 - (d) Stall (clean) recovery with power.
 - (e) Stall (clean) recovery without power.
 - (f) Stall in approach configuration (with power).
 - (g) Spin/incipient spin (if applicable).
 - (h) Forced landing without power.
 - (i) Precautionary landing.
 - (j) Radio procedures.
 - (k) Safety considerations.
- (5) Arrival and landing procedures
 - (a) Aerodrome arrival procedures.
 - (b) Glide approach.
 - (c) Short field landing.
 - (d) Crosswind landing.
 - (e) Go-around from low height.
 - (f) ATC procedures.
 - (g) Safety considerations.
- (6) Navigation
 - (a) Navigation log/plan.
 - (b) ATC flight plan.

- (c) Maintenance of altitude and heading.
- (d) Map reading.
- (e) Revision of ETA
- (f) Log keeping.
- (g) Use of radio navigation aids.
- (h) Basic IF (180 turn in simulated IMC).
- (i) Fuel/engine management.
- (j) Systems and carburettor icing checks.
- (k) ATC procedures and altimeter setting.
- (l) Safety considerations.

(7) Action after flight

- (a) Shut down procedures.
- (b) Securing procedures.
- (c) Post flight inspection.
- (d) Safety considerations.

(8) Multi-engine flight (if applicable)

This manoeuvre may be combined with the manoeuvres contained in subparagraphs (1) to (7). The control of the aeroplane and correct actions must be evaluated during the following situations:

- (a) Simulated engine failure (take-off).
- (b) Simulated engine failure (approach).
- (c) Asymmetric approach and landing.
- (d) Engine failure procedures.
- (e) Safety considerations.
- (f) ATC procedures.

(9) Abnormal and emergency procedures

Note: The applicant is expected to indicate the actions to be taken and carry out touch drills but is not expected to perform any operating action. This manoeuvre may be combined with other manoeuvres.

- (a) Engine fire during start and in the air.
- (b) Alternate landing gear extension.
- (c) Electrical failure.
- (d) Brake failure.
- (e) Smoke or fire in the cabin.
- (f) Trim system problems.
- (g) Radio failure.
- (h) Other (state).

(10) General

- (a) Decision making ability.
- (b) Overall safety considerations.
- (c) General smoothness and coordination.
- (d) Ability to plan ahead.
- (e) Overall impression.

1.2 The procedures and maneuvers must include –

- (1) take-off, circuit and landing;
- (2) incipient spin recovery;
- (3) recovery from full left and right spins;
- (4) steep turns left and right at constant height;
- (5) simulated forced landing from a minimum height of 2 000 feet to execute a landing not more than 150 m beyond a point selected by the designated examiner conducting the skill test;
- (6) execution of a landing, with or without the aid of the engine, between two marks selected by the designated examiner conducting the skill test, which must be at least 75 m apart measured along the line of approach; and
- (7) cross-country flight test, accompanied by the designated examiner conducting the test of not less than 100 nautical miles and not less than 30 nautical miles distant from the point of departure, including a landing at two places other than the base. At least one of the places from which the aeroplane takes off for this flight shall be an aerodrome where an air traffic services unit is in operation, and a flight plan must be submitted in respect of such flight.

2. Conducting the skill test

- (1) The skill test must be conducted by a Category A, Grade II or Grade I flight instructor, or a designated examiner.
- (2) The skill test must be preceded by an oral examination on, but not limited to –
 - (a) normal, abnormal and emergency procedures;
 - (b) limitations;
 - (c) systems knowledge; and
 - (d) the applicable Air Law, where appropriate.

3. Skill test report

- (1) Completion

The flight instructor or designated examiner conducting the skill test, must complete the skill test report number MZ 61-30, which is available from the Director General.

- (2) Assessment

All the procedures and manoeuvres must be assessed as indicated on the test form.

61.03.6 APPLICATION FOR PRIVATE PILOT LICENSE (A)

1. Form of application

The application form for the issuing of a private pilot license (aeroplane) is form MZ 61-02, which is available from the Director General.

2. Skill test report

The skill test report that must accompany an application for the issuing of a private pilot license (aeroplane) is form number MZ 61-30 which is available from the Director General.

61.03.7 ISSUING OF PRIVATE PILOT LICENSE (A)

1. Form of license

A private pilot license (aeroplane) is issued on the form determined by the Director General.

61.03.11 MAINTENANCE OF COMPETENCY (PPL-A)

1. Type or similar type of aeroplane

- (1) The aeroplane type (name) shall mean the ICAO designator allocated to that specific type of aeroplane as contained in Doc 8643. For instance, a Cessna 150 aeroplane will be reflected as a C150.
- (2) In absence of an ICAO designator, for instance in the case of self built aeroplanes, the Director General will allocate an official IACM designator.
- (3) When a group type of 2700 kg is reflected on a pilot's license it does not mean that he may readily fly any aeroplane within that group. The pilot would only be allowed to fly those aeroplanes (and systems) within the group that have been endorsed by his instructor in his/her logbook after the appropriate training has been received.
- (4) For maintenance of competency, the pilot may thus conduct the required take-offs and landings in the specific type of aeroplane which has been endorsed in his logbook that he intends to carry passengers on.
- (5) A similar type is considered to be any variant of the type of aeroplane to be used which is included under the same ICAO designator and which has the same systems as the aeroplane in which the flight is to be undertaken.
- (6) The relevant systems applicable are listed below:-
 - (a) Nose wheel-type undercarriage,
 - (b) tail wheel-type undercarriage,
 - (c) retractable undercarriage,
 - (d) carburettor engines,
 - (e) normal-aspirated engines,
 - (f) fuel-injected engines,
 - (g) turbo-and supercharged engines,
 - (h) geared engines,
 - (i) fixed-pitch propellers,
 - (j) variable-pitch and constant speed propellers,
 - (k) pressurisation.

61.04.3 TRAINING (PPL-H)

1. Aim of training course

The aim of the training course is to train a candidate to the level of proficiency required for the issuing of the private pilot license (helicopter).

2. Duration, contents and requirements of training course

The duration of the course must not exceed 24 months.

The course comprises a -

- (1) theoretical knowledge course to private pilot license level; and
- (2) practical training course.

3. Theoretical knowledge course

The theoretical knowledge course must comprise at least 100 hours of instruction, of which 40 hours may be monitored self-study by means of assignments. This instruction must include classroom work, interactive video, slide tape presentation, computer-based training and learning carrels, where applicable.

The 100 hours of instruction should preferably be divided as follows:

Subject	Hours
Air law and ATC procedures	10
Helicopter general knowledge	10
Flight performance and planning	20
Navigation	12
Meteorology	7
Operational procedures	10
Principles of flight	6
Human performance and limitations	10
Communications	10

4. Theoretical knowledge course syllabus

The theoretical knowledge course syllabus for Private Pilot Helicopter Pilots is in the Generic Theoretical Knowledge Course Syllabus contained in Technical Standard 61.01.30.

5. Practical training course

The practical training course must cover the following:

5.1 Exercise 1A Familiarisation with the helicopter

- (a) characteristics of the aircraft
- (b) cockpit layout

- (c) systems
- (d) check lists, drills, controls

5.2 Exercise 1B Emergency drills

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

5.3 Exercise 2 Preparation for and action after flight

- (a) flight authorisation and aircraft acceptance
- (b) serviceability documents
- (c) equipment required, maps, etc.
- (d) external checks
- (e) internal checks
- (f) harness, seat or rudder panel adjustments
- (g) starting and warm up checks, clutch engagement, starting rotors
- (h) power checks
- (i) running down system checks and switching off the engine
- (j) parking, security and picketing (e.g. tie down)
- (k) completion of authorisation sheet and serviceability documents

5.4 Exercise 3 Air experience

- (a) Flight exercise
- (b) introduce student to rotary wing flight

5.5 Exercise 4 Effects of controls - helicopter

- (a) primary effects when laterally level and when banked
- (b) secondary effects of aileron and rudder
- (c) effect of airspeed
- (d) effect of power changes (torque)

- (e) effect of yaw (sideslip)
- (f) effect of disk loading (blank and flare)
- (g) effect on controls on selecting hydraulics on/off
- (h) effect of control friction
- (i) use of carburettor heat and attitude changes

5.6 Exercise 5 Power and attitude changes

- (a) relationship between cyclic control position, disk attitude, fuselage attitude, airspeed
- (b) flapback
- (c) power required diagram in relation to airspeed
- (d) power and airspeed changes in level flight
- (e) use of instruments for precision
- (f) engine and airspeed limitations

5.7 Exercise 6A Straight and level

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

5.8 Exercise 6B Climbing

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

5.9 Exercise 6C Descending

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

5.10 Exercise 6D Turning

- (a) initiation and maintaining medium level turns
- (b) resuming straight flight
- (c) altitude, bank and co-ordination
- (d) climbing and descending turns and effect on rate of climb/ descent
- (e) turns onto selected headings, use of gyro heading indicator and compass
- (f) use of instruments for precision

5.11 Exercise 7 Basic autorotation

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

5.12 Exercise 8A Hovering

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

5.13 Exercise 8B Hover taxiing, spot turns

- (a) revise hovering
- (b) precise ground speed/height control
- (c) effect of wind direction on helicopter attitude and control margin
- (d) control, co-ordination during spot turns
- (e) carefully introduce gentle forward running touchdown

5.14 Exercise 8C Hovering, taxiing emergencies

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

5.15 Exercise 9 Take-off and landing

- (a) pre-take off checks/drills
- (b) lookout

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

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

- (a) lookout
- (b) revise take-off and landing
- (c) ground effect, translational lift and its effects
- (d) flapback and its effects
- (e) effect of wind speed/direction during transitions from/to the hover
- (f) the constant angle approach
- (g) demonstration of variable flare simulated engine off landing

5.17 Exercise 11A Circuit, approach and landing

- (a) revise transitions from hover to climb and approach to hover
- (b) circuit procedures, downwind, base leg
- (c) approach and landing with power
- (d) pre landing checks
- (e) effect of wind on approach and I.G.E. hover
- (f) crosswind approach and landing
- (g) go around
- (h) noise abatement procedures

5.18 Exercise 11B Steep and limited power approaches and landings

- (a) revise the constant angle approach

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

5.19 Exercise 11C Emergency procedures

- (a) abandoned take-off
- (b) missed approach/go-around
- (c) hydraulic OFF landing, (if applicable)
- (d) tail rotor control or tail rotor drive failure (briefing only)
- (e) simulated emergencies in the circuit to include:
- (f) hydraulics failure
- (g) simulated engine failure on take-off, cross wind, downwind and base leg
- (h) governor failure

5.20 Exercise 12 First solo

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

5.21 Exercise 13 Sideways and backwards hover manoeuvring

- (a) manoeuvring sideways flight heading into wind
- (b) manoeuvring backwards flight heading into wind

- (c) combination of sideways and backwards manoeuvring
- (d) manoeuvring sideways and backwards, heading out of wind
- (e) stability, weathercocking
- (f) recovery from backwards manoeuvring, (pitch nose down)
- (g) groundspeed limitations for sideways and backwards manoeuvring

5.22 Exercise 14 Spot turns

- (a) revise hovering into wind and downwind
- (b) turn on spot through 360°:
- (c) around pilots position
- (d) around tail rotor
- (e) around helicopter geometric centre
- (f) square, safe visibility clearing turn
- (g) rotor RPM control, torque effect, cyclic limiting stops due to C of G position and wind speed/direction

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

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

5.24 Exercise 16 Simulated engine off landings (EOL)

- (a) the effect of weight, disc loading, density altitude, RRPM decay
- (b) revise basic autorotation entry
- (c) optimum use of cyclic and collective to control speed/RRPM
- (d) variable flare simulated EOL
- (e) demonstrate constant attitude simulated EOL
- (f) demonstrate simulated EOL from hover/hover taxi
- (g) demonstrate simulated EOL from transition and low level

5.25 Exercise 17 Advanced autorotation

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

5.26 Exercise 18 Practice forced landings

- (a) procedure and choice of the forced landing area
- (b) forced landing checks and crash action
- (c) re-engagement and go-around procedures

5.27 Exercise 19 Steep turns

- (a) steep (level) turns (30° bank)
- (b) maximum rate turns (45° bank if possible)
- (c) steep autorotative turns
- (d) faults in the turn - balance, attitude, bank and co-ordination
- (e) RRPM control, disc loading
- (f) vibration and control feedback
- (g) effect of wind at low level

5.28 Exercise 20 Transitions

- (a) revise ground effect, translational lift, flapback
- (b) maintaining constant height, (20-30 feet AGL):
- (c) transition from hover to minimum 50 knots IAS and back to hover
- (d) demonstrate effect of wind

5.29 Exercise 21: Quickstops

- (a) use of power and controls
- (b) effect of wind
- (c) quickstops into wind
- (d) quickstops from crosswind and downwind terminating into wind
- (e) danger of vortex ring
- (f) danger of high disc loading

5.30 Exercise 22A Navigation

Flight planning

- (a) weather forecast and actuals
- (b) map selection and preparation and use
- (c) choice of route
- (d) calculations
- (e) magnetic heading(s) and time(s) en-route
- (f) fuel consumption
- (g) mass and balance
- (h) flight information
- (i) NOTAM etc
- (j) radio frequencies
- (k) selection of alternate landing sites
- (l) helicopter documentation
- (m) notification of the flight
- (n) pre-flight administrative procedures
- (o) flight plan form (where appropriate)

Departure

- (a) organisation of cockpit workload
- (b) departure procedures

- (c) altimeter settings
- (d) ATC liaison in controlled/regulated airspace
- (e) setting heading procedure
- (f) noting of ETA
- (g) maintenance of height/altitude and heading
- (h) revisions of ETA and heading
- (i) 10° line, double track and track error, closing angle
- (j) 1 in 60 rule
- (k) amending an ETA
- (l) log keeping
- (m) use of radio
- (n) use of nav aids
- (o) minimum weather conditions for continuation of flight
- (p) in-flight decisions
- (q) transiting controlled/regulated airspace
- (r) uncertainty of position procedure
- (s) lost procedure

Arrival, aerodrome joining procedure

- (a) ATC liaison in controlled/regulated airspace
- (b) altimeter setting
- (c) entering the traffic pattern
- (d) circuit procedures
- (e) parking
- (f) security of helicopter
- (g) refuelling
- (h) closing of flight plan, (if appropriate)
- (i) post-flight administrative procedures

5.31 Exercise 22 Navigation problems at low heights and in reduced visibility

- (a) actions prior to descending
- (b) hazards (e.g. obstacles, other aircraft)
- (c) difficulties of map reading
- (d) effects of wind and turbulence
- (e) avoidance of noise sensitive areas
- (f) joining the circuit
- (g) bad weather circuit and landing

5.32 Exercise 22C Radio navigation

- (a) Use of VHF Omni Range (VOR)
- (b) availability, AIP, frequencies
- (c) selection and identification
- (d) omni bearing selector (OMB)
- (e) to/from indications, orientation
- (f) course deviation indicator (CDI)
- (g) determination of radial
- (h) intercepting and maintaining a radial
- (i) VOR passage
- (j) obtaining a fix from two VOR
- (k) use of automatic direction finding equipment (ADF)/non directional beacons (NDB)
- (l) availability, AIP, frequencies
- (m) selection and identification
- (n) orientation relative to the beacon
- (o) homing
- (p) use of VHF direction finding (VHF/DF)
- (q) availability, AIP, frequencies
- (r) RTF procedures and ATC liaison

- (s) obtaining a QDM and homing
- (t) use of distance measuring equipment (DME)

5.33 Exercise 23 Advanced take-off, landings, transitions

- (a) landing and take-off out of wind (performance reduction)
- (b) ground effect, translational lift and directional stability variation when out of wind
- (c) downwind transitions
- (d) vertical takeoff over obstacles
- (e) reconnaissance of landing site
- (f) running landing
- (g) zero speed landing
- (h) cross wind and downwind landings
- (i) steep approach
- (j) go-around

5.34 Exercise 24 Sloping ground

- (a) limitations, assessing slope angle
- (b) wind and slope relationship - blade and control stops
- (c) effect of C of G when on slope
- (d) ground effect on slope, power required
- (e) right skid up slope
- (f) left skid up slope
- (g) nose up slope
- (h) avoidance of dynamic roll over, dangers soft ground and sideways movement on touchdown
- (i) danger of striking main/tail rotor by harsh control movement near ground

5.35 Exercise 25 Limited power

- (a) take-off power check
- (b) vertical take-off over obstacles

- (c) in flight power check
- (d) running landing
- (e) zero speed landing
- (f) approach to low hover
- (g) approach to hover
- (h) approach to hover OGE
- (i) steep approach
- (j) go-around

5.36 Exercise 26 Confined areas

- (a) landing capability, performance assessment
- (b) locating landing site, assessing wind speed/direction
- (c) reconnaissance of landing site
- (d) select markers
- (e) select direction and type of approach
- (f) circuit
- (g) approach to committed point and go around
- (h) approach
- (i) clearing turn
- (j) landing
- (k) power check, performance assessment in and out of ground effect
- (l) normal take-off to best angle of climb speed
- (m) vertical take-off from hover

5.37 Exercise 27 Basic instrument flight

- (a) physiological sensations
- (b) instrument appreciation
- (c) attitude instrument flight
- (d) instrument scan
- (e) instrument limitations

- (f) basic manoeuvres
- (g) recoveries from climbing and descending turns
- (h) recoveries from unusual attitudes

Note: This matrix is intended to give an example of the allocation of flying hours on the basis of the minimum requirements set out in this technical standard.

Exercises	Acc Total	Solo	Dual	IFR	VFR	SE
Pre-solo (1 to 5)	11.5	5	11		11.5	11.5
Consolidation	17	2.5	3		5.5	5.5
Advanced exercises (16 - 18)	25	5	3		8	8
Intro to IF (20)	27		2	2		2
Navigation (19)	38	6	6		10	10
Consolidation	40	2	1		3	3
Flight Test / Check (PPL)		3*			3	
Totals (45)	40	19	26	2	40	40

* - If successful

61.04.4 THEORETICAL KNOWLEDGE EXAMINATION (PPL-H)

1. Contents

An applicant for a private pilot license (aeroplane) must pass a written theoretical knowledge examination on -

- (1) the regulations concerning -
 - (a) conditions relating to flying in Mozambique;
 - (b) licensing requirements applicable to private pilots;
 - (c) logbooks and crediting of flight time;
 - (d) rules of the air, flight rules and visual flight rules;
 - (e) instrument flight rules;
 - (f) ground and light signals for aerodrome traffic;
 - (g) air traffic services;
 - (h) search and rescue;
 - (i) taxi rules;
 - (j) investigation of aircraft accidents;
 - (k) requirements applicable to aircraft flying to or from or over Mozambique on other than scheduled international commercial air transport operations; (l) prohibited and restricted areas;
 - (m) knowledge of the following as set out in the AIP, AIP SUP, NOTAM and AIC currently in force:
 - (i) Aeronautical information services available to pilots;
 - (ii) units of measurement;
 - (iii) meteorological information available to pilots;
 - (iv) names and functions of the various air traffic services units and designations of associated airspaces;
 - (iv) altimeter setting procedures; and
 - (vi) prohibited, restricted and danger areas;
- (2) the elementary principles of
 - (a) aeronautical charts;

- (b) meteorological information for cross-country flights;
- (c) the compass.

- (3) the technical subjects prescribed in paragraph 2.

2. General

- (1) Elementary principles of theory of flight, definition of terms, e.g. airflow, forces on a helicopter, relation between speed and angle of attack, angle of incidence, lift/drag ratio, stability, centre of pressure.
- (2) Properties of air, density, pressure, relationship between pressure, density and temperature, and their effect on aeroplanes and engine performance, isothermal atmosphere, international standard atmosphere.
- (3) The action to be taken in the event of a serious defect or a heavy landing.
- (4) The principles of operation of engines and their component parts and accessories.
- (5) Definition of the terms associated with propellers, function of constant speed, fully feathering and braking propellers.
- (6) Direction of movement of controls, principles of operation and function of trimming, servo or balance tabs and alternative devices.
- (7) Elementary knowledge of electricity and magnetism - definition of terms, e.g. volts, amperes, ohms, watts, alternating and direct current, aircraft batteries - charging and functioning.

3. Conducting of theoretical knowledge examination

- (1) The written theoretical knowledge examination must be conducted by the Director General.
- (2) The Director General may publish
 - (a) the dates on which examinations are to be written;
 - (b) the latest date by which applications for each such examination are to reach the Director General;
 - (c) the format and duration of each examination; and
 - (d) the fees payable for such examinations.
- (3) The entry fee paid for any examination may, upon request by the candidate, be refunded or transferred to a subsequent examination: Provided that an acceptable reason for such request is furnished.

4. Admission to examinations

Admission to a written theoretical examination is subject to the following conditions:

- (1) An application for admission to the examination must be made on the relevant application form;
- (2) the application must be accompanied by the entry fee;
- (3) the application and fee must be submitted to the Director General to reach its office on or before the closing date published for such examination;
- (4) the rules and instructions determined by the Director General for such examination, must be complied with, which rules and instructions must be supplied to a candidate upon his or her admission for a particular examination; and
- (5) a candidate must subject himself or herself to disqualification from future examinations for a period not exceeding 12 months if the rules and instructions referred to in subparagraph (4) are contravened and the candidate will be deemed to have failed the examination in which such contravention occurred.

5. Remarking of examination scripts

- (1) A candidate who has failed one or more examination papers with a mark between 66% and 69%, may on payment of the fee determined by the aviation training organisation, apply for the remarking of the script or scripts concerned.
- (2) Application for the remarking of an examination script or scripts must be made in writing to the aviation training organisation, and such application, accompanied by the fee, must reach the aviation training organisation not later than one month after the examination results were published.
- (3) The decision of the aviation training organisation on any remarked examination script is final.

61.04.5 SKILL TEST (PPL-H)

1. Procedures and manoeuvres**1.1 An applicant for a private pilot license (helicopter) must demonstrate the following procedures and manoeuvres:**

- (1) Pre-flight checks and preparation;
- (2) helicopter exterior visual inspection; location of each item and purpose of inspection;
- (3) cockpit inspection;
- (4) prior to starting engine:
 - (a) Starting procedures;
 - (b) radio equipment checks;
 - (c) communication frequencies;
- (5) pre-take-off procedures;
- (6) hover manoeuvres:
 - (a) Lift off and touchdown;
 - (b) stationary hovering with head-cross-tail wind, if applicable;
 - (c) stationary hover turns 360 degrees left and right;
 - (d) forward, sideways and rearwards hovering;
 - (e) engine failure during hovering;
- (7) quick stops from different speeds;
- (8) take-offs:
 - (a) Take-offs (various profiles);
 - (b) simulated engine failure during take-off;
 - (c) after T/O checks, departure procedure, ATC liaison and compliance, R/T procedures;
- (9) flight procedures and manoeuvres:
 - (a) Climbing and descending turns to specified headings;
 - (b) level flight, control of heading, altitude and speed;

- (c) turns with 30 degrees bank, 180 to 360 degrees left and right, visually and by sole reference to instruments;
- (10) navigation:
 - (a) Navigation at various altitudes, map reading;
 - (b) altitude, speed, heading control, observation of airspace, altimeter setting;
 - (c) observation of weather conditions, assessment of trends, diversion planning;
 - (d) monitoring of flight progress, flight log, fuel usage, instrument monitoring;
- (11) approach and landings:
 - (a) Arrival procedures, altimeter setting, checks;
 - (b) ATC liaison and compliance, RT procedures;
 - (c) landings (various profiles);
 - (d) descend in autorotation;
 - (e) autorotative landing;
- (12) abnormal and emergency procedures:
 - (a) Engine;
 - (b) fuel system;
 - (c) electrical system;
 - (d) hydraulic system (if relevant);
 - (e) main and tail rotor system;
 - (f) other abnormal and emergency procedures as outlined in Manual.

2. Conducting the skill test

The skill test must be conducted by a Category B, Grade 11 or Grade I flight instructor, or a designated examiner. The skill test must be preceded by an oral examination on, but not limited to –

- (1) normal, abnormal and emergency procedures;
- (2) the appropriate Flight limitations;
- (3) systems knowledge; and
- (4) the applicable Air Law, where appropriate.

3. Skill test report

(1) Completion

The flight instructor or designated examiner conducting the skill test, must complete the skill test report number MZ 61-32, which is available from the Director General.

(2) Assessment

All the procedures and manoeuvres must be assessed as indicated on the test form.

61.04.6 APPLICATION FOR PRIVATE PILOT LICENSE (H)

1. Form of application

The application form for the issuing of a private pilot license (helicopter) is form MZ 61-02, which is available from the Director General.

2. Skill test report

The skill test report that must accompany an application for the issuing of a private pilot license (helicopter) is form number MZ 61-32 which is available from the Director General.

61.04.7 ISSUING OF PRIVATE PILOT LICENSE (H)

1. Form of license

A private pilot license (helicopter) is issued on the form determined by the Director General.

61.04.11 MAINTENANCE OF COMPETENCY (PPL-H)

1. Type or similar type of helicopter

- (1) The helicopter type (name) shall mean the ICAO designator allocated to that specific type of helicopter as contained in Doc 8643. For instance, a Robinson 22 helicopter will be reflected as a R22.
- (2) In absence of an ICAO designator, for instance in the case of self built helicopter, the Director General will allocate an official IACM designator.
- (3) A helicopter type is reflected on a pilot's license and endorsed in the pilot's logbook by the instructor after the appropriate training has been received.
- (4) For maintenance of competency, the pilot may thus conduct the required circuits and landings in the specific type of helicopter which is reflected on his license that he intends to carry passengers on.
- (5) A similar type is considered to be any variant of the type of helicopter to be used which is included under the same ICAO designator and which has the same systems as the helicopter on which the flight is to be undertaken.
- (6) In cases where there are differences between helicopters under a specific name, it is the responsibility of the pilot to be acquainted with such differences. Where such differences are of a major nature, such as a substantial difference in for instance the power-plant, the pilot is to acquaint himself thoroughly with such difference and fly with an instructor and on completion have his logbook certified by the instructor.

61.05.3 TRAINING (CPL-A)

1. Aim of training course

The aim of the commercial pilot license (aeroplane) training course is to train the holder of a commercial pilot license (aeroplane) to the level necessary for the issuing of a commercial pilot license (aeroplane).

2. Duration, contents and requirements of training course

The applicant must be the holder of a private pilot license (aeroplane). The course must be completed within 18 months.

The course comprises -

- (a) a theoretical knowledge course to commercial pilot license (aeroplane) knowledge level; and
- (b) visual and instrument flying training.

3. Theoretical knowledge course

The theoretical knowledge course comprises at least 350 hours of instruction, of which 150 hours may be monitored self-study by means of assignments, including formal classroom work, computer-based training, slide/tape presentation, interactive video and learning carrels, where appropriate.

The 350 hours of instruction should preferably be divided as follows:

Subject	Hours instruction	Hours monitored self-study
Air Law and ATC procedures	40	15
Aircraft general knowledge	50	15
Flight performance and planning	55	20
Human performance and limitations	10	5
Meteorology	50	25
Navigation	90	45
Operational procedures	10	5
Principles of flight	25	10
Communications	20	10

4. Theoretical knowledge course syllabus

The theoretical knowledge course syllabus for Commercial Pilot Aeroplane Pilots is in the Generic Theoretical Knowledge Course Syllabus contained in Technical Standard 61.01.30.

5. Practical training course

Exercise	Sim	Dual	Solo	Acc Total	VFR	IFR	S/E or WE
Instrument flight	5	5		10	15	10	10
Visual flight		15	10	25	15		15
Night flight		5		40			15
Totals	5	25	10		20	10	40

A minimum of 5 hours of the above dual instruction must be carried out in a single- or multi-engine aeroplane certified to carry at least 4 persons and is both fitted with a variable pitch propeller and retractable landing gear.

5.1 Visual flight

The 15 hours of visual flight should include the following exercises:

- (1) Pre-flight operations, mass and balance determination, aeroplane inspection and servicing;
- (2) take-off, traffic pattern, approach and landing. Use of checklists, collision avoidance and checking procedures;
- (3) traffic patterns, simulated engine failure during and after take-off;
- (4) maximum performance take-offs and short field landings;
- (5) crosswind take-offs and landings and go-arounds;
- (6) flight at relatively critical high airspeeds, recognition and recovery from spiral dives;
- (7) flight at critically slow airspeeds, spin avoidance, recognition of and recovery from incipient and full stalls;
- (8) incipient and full spins applicable to type; and
- (9) cross country flying using DR and radio navigation aids.

Flight planning by the applicant, filing of flight plans, evaluation of weather briefing documentation, NOTAM, RT. 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 communications

failure, weather deterioration, diversion procedures, and simulated engine failure during cruise flight and selection of an emergency strip.

5.2 Instrument flight

The 10 hours of instrument flight should comprise the following:

- (1) Basic attitude flying;
- (2) climbing descending, maintaining heading and speed, transition to horizontal flight, climbing and descending turns;
- (3) instrument pattern
 - (a) Decelerate to approach speed, flaps to approach configuration;
 - (b) initiate a standard turn left or right;
 - (c) roll out on opposite heading and maintain for 1 minute;
 - (d) standard turn with the gear down descend at 500 fpm;
 - (e) roll out on initial heading and descend at 500 fpm on this heading for 1 minute;
 - (f) transition to level flight 1 000 ft below initial altitude;
 - (g) initiate a go-around; and
 - (h) climb at best rate of climb speed;
- (4) repeat the exercise on basic attitude flying together with 45° of bank and recovery from unusual attitudes;
- (5) repeat exercise 4 of paragraph 5.1 again;
- (6) radio navigation using the VOR,
- (7) NDB and intercepting bearings to and from navigation stations (QDM and QDR);
- (8) repeat exercise 3 of paragraph 5.1 and recovery from unusual attitudes;
- (9) repeat basic attitude flying with turns and simulated A/H and DI failure (limited panel); recognition of and recovery from incipient and full stalls;
- (10) recognition of and recovery from incipient spins, if applicable to type; and
- (11) repeat exercises where problems were observed.

If required, the above-mentioned exercises can be carried out in a multi-engine aeroplane. However, the applicant should have

completed the type and class rating requirements on the multi-engine aeroplane to be used for the test prior to commencing this training.

61.05.4 THEORETICAL KNOWLEDGE EXAMINATION (CPL-A)

1. Contents

An applicant for a commercial pilot license (aeroplane) must pass a written theoretical knowledge examination on -

- (1) the regulations concerning -
 - (a) conditions relating to flying in Mozambique;
 - (b) licensing requirements applicable to commercial pilots;
 - (c) logbooks and crediting of flight time;
 - (d) rules of the air; flight rules; visual flight rules;
 - (e) instrument flight rules;
 - (f) ground and light signals for aerodrome traffic;
 - (g) air traffic services;
 - (h) search and rescue;
 - (i) taxi rules;
 - (j) investigation of aircraft accidents;
 - (k) requirements applicable to aircraft flying to or from or over Mozambique on other than scheduled international commercial air transport operations;
 - (l) prohibited and restricted areas;
 - (m) knowledge of the following as set out in the AIP, AIP SUP, NOTAM and AIC currently in force:
 - (i) Aeronautical information services available to pilots;
 - (ii) units of measurement;
 - (iii) meteorological information available to pilots;
 - (iv) names and functions of the various air traffic services units and designations of associated airspace;
 - (v) altimeter setting procedures;
 - (vi) prohibited, restricted and danger areas;
 - (vii) the organisation and operation of the various air traffic services units;
 - (viii) holding, approach and departure procedures;
 - (ix) entry and departure requirements;
 - (x) search and rescue; and
 - (xi) incident reporting procedures;
 - (n) flight-time limitations;

- (o) when licensed aerodromes must be used;
- (p) training of flight crew members;
- (2) navigation;
- (3) elementary meteorology; and
- (4) the technical subject prescribed in paragraph 2.

2. General

- (1) Elementary principles of theory of flight, definition of terms, e.g. airflow, forces on an aircraft, straight and level flight, relation between speed and angle of attack, angle of incidence, lift/drag ratio, stability, centre of pressure, flaps and slots.
- (2) Properties of air, density, pressure, relationship between pressure, density and temperature, and their effect on aircraft and engine performance, isothermal atmosphere, international standard atmosphere.
- (3) The action to be taken in the event of a serious defect or a heavy landing.
- (4) The principles of operation of engines and their component parts and accessories
- (5) Definition of the terms associated with propellers, function of constant speed, fully feathering and braking propellers
- (6) Direction of movement of controls, principles of operation and function of trimming, servo or balance tabs and alternative devices.
- (7) Elementary knowledge of electricity and magnetism - definition of terms, e.g. volts, amperes, ohms, watts, alternating and direct current, aircraft batteries - charging and functioning.

3. Conducting of theoretical knowledge examination

The written theoretical knowledge examination is conducted by the Director General.

4. Duties of Director General

- (1) The Director General must publish in an AIC -
 - (a) the dates on which examinations are to be written;
 - (b) the latest date by which applications for each such examination are to reach the Director General;
 - (c) the format and duration of each examination; and
 - (d) the fees payable for such examinations.
- (2) The entry fee paid for any examination may, upon request by the candidate, be refunded or transferred to a subsequent examination: Provided that an acceptable reason for such request is furnished.

5. Admission to examinations

Admission to a written theoretical examination is subject to the following conditions:

- (1) An application for admission to the examination must be made on the relevant application form;
- (2) the application must be accompanied by the fee prescribed in Part 187 of the MOZ-CAR;
- (3) the application and fee must be submitted to the Director General, to reach the Director General's office on or before the closing date published for such examination;
- (4) the rules and instructions determined by the Director General for such examination, must be complied with, which rules and instructions must be supplied to a candidate upon his or her admission for a particular examination; and
- (5) a candidate must subject himself or herself to disqualification from future examinations for a period not exceeding 12 months if the rules and instructions referred to in subparagraph (4) are contravened and the candidate will be deemed to have failed the examination in which such contravention occurred.

6. Remarking of examination scripts

- (1) A candidate who has failed one or more examination papers with a mark between 66% and 69%, may on payment of the fee prescribed in Part 187 of the MOZ-CAR, apply for the remarking of the script or scripts concerned.
- (2) Application for the remarking of an examination script or scripts must be made in writing to the Director General, and such application, accompanied by the fee, must reach the Director General not later than one month after the examination results were published.
- (3) The decision of the Director General on any remarked examination script, is

61.05.5 SKILL TEST (CPL-A)

1. Procedures and manoeuvres

An applicant for a commercial pilot license (aeroplane) must demonstrate the following procedures and manoeuvres:

(1) Pre-flight procedures

- (a) Aeroplane knowledge.
- (b) Mass and balance.
- (c) Performance calculations.
- (d) Pre-flight inspection.
- (e) Engine starting.
- (f) Pre-taxi checks.
- (g) Taxi.
- (h) Pre-take-off procedures.
- (i) Radio procedures.
- (j) Safety considerations.

(2) Take-off

- (a) Pre-take-off briefing.
- (b) Short/soft field take-off.
- (c) Normal take-off.
- (d) Crosswind take-off.
- (e) Engine failure during/after take-off.
- (f) Safety considerations.

(3) Departure

- (a) Aerodrome departure procedures.
- (b) Accuracy of flight.
- (c) ATC liaison.
- (d) Climbing.
- (e) Climbing turns.
- (f) Levelling off.
- (g) Safety considerations.

(4) General flying

- (a) Straight and level.
- (b) With reference to instruments only:
 - (i) Steep turns (45° bank) left and right;
 - (ii) flight at minimum speed;
 - (iii) stall (clean) recovery with power;
 - (iv) stall (clean) recovery without power;
 - (v) stall in approach configuration (with power);
 - (vi) level flight cruise;
 - (vii) climbing and descending turns;
 - (viii) recovery from unusual attitudes.

Note: Exercise (vi) to (vii) not for valid instrument rating holders.

- (c) Spin/incipient spin (if applicable).
- (d) Forced landing without power.
- (e) Precautionary landing.
- (f) Radio procedures.
- (g) Safety considerations.

(5) Arrival and landing procedures

- (a) Aerodrome arrival procedures.
- (b) Glide approach.
- (c) Short field landing.
- (d) Crosswind landing.
- (e) Go-around from low height.
- (f) ATC procedures.
- (g) Safety considerations.

(6) Navigation

- (a) Navigation log/plan.
- (b) Flight plan.
- (c) Maintenance of altitude and heading.
- (d) Map reading.
- (e) Revision of ETA.
- (f) Log keeping.
- (g) Use of radio navigation aids (position fix).

- (h) Tracking, positioning (NDB + VOR).
- (i) Fuel/engine management.
- (j) Systems and carburettor icing checks.
- (k) ATC procedures and altimeter setting.
- (l) Safety considerations.

(7) Action after flight

- (a) Shut down procedures.
- (b) Securing procedures.
- (c) Post flight inspection.
- (d) Safety considerations.

(8) Multi-engine flight (if applicable)

Note: This section may be combined with sections (1) - (7).

The control of the aeroplane and correct actions must be evaluated during the following situations:

- (a) Simulated engine failure (take-off).
- (b) Simulated engine failure (approach).
- (c) Asymmetric approach and landing.
- (d) Engine failure procedures.
- (e) Safety considerations.
- (f) ATC procedures

(9) Abnormal and emergency procedures:

Note: The applicant is expected to indicate the actions to be taken and carry out touch drills but is not expected to perform any operating action. This section may be combined with other sections.

- (a) Engine fire during start and in the air.
- (b) Alternate landing gear extension.
- (c) Electrical failure.
- (d) Brake failure.
- (e) Smoke or fire in the cabin.
- (f) Trim system problems.
- (g) Radio failure.
- (h) Other (state).

(10) General

- (a) Decision making ability.
- (b) Overall safety considerations.
- (c) General smoothness and coordination.
- (d) Ability to plan ahead.
- (e) Overall impression.

The procedures and manoeuvres must include –

- (1) the ability to perform both normal and emergency manoeuvres, appropriate to the type of aeroplane used in the test, with a degree of competency appropriate to that of a commercial pilot (aeroplane);
- (2) instrument flight, which includes the interception of predetermined radials, QDR and QDM tracking to or from VOR and NDB stations and utilising navigation aids as applicable;
- (3) night flight; and
- (4) flight planning and mass and balance problems appropriate to the type of aeroplane used for the test.

2. Conducting the skill test

The skill test must be conducted by a designated examiner.

The skill test must be preceded by an oral examination on, but not limited to –

- (1) normal, abnormal and emergency procedures;
- (2) limitations;
- (3) systems knowledge; and
- (4) the applicable Air Law, where appropriate.

3. Skill test report

- (1) Completion

The designated examiner conducting the skill test must complete the skill test report number MZ 61-31, which is available from the Director General.

- (2) Assessment

All the procedures and manoeuvres must be assessed as indicated on the test form.

61.05.6 APPLICATION FOR COMMERCIAL PILOT LICENSE (CPL-A)

1. Form of application

The application form for the issuing of a commercial pilot license (aeroplane), is form MZ 61-03, which is available from the Director General.

2. Skill test report

The skill test report that must accompany an application for the issuing of a commercial pilot license (aeroplane), is form number MZ 61-31 which is available from the Director General.

61.05.7 ISSUING OF COMMERCIAL PILOT LICENSE (CPL-A)

1. Form of license

A commercial pilot license (aeroplane) is issued on the form determined by the Director General.

61.05.11 MAINTENANCE OF COMPETENCY (CPL-A)

1. Type or similar type of aeroplane

- (1) The aeroplane type (name) shall mean the ICAO designator allocated to that specific type of aeroplane as contained in Doc 8643. For instance, a Beechcraft 90 aeroplane will be reflected as a B90.
- (2) In absence of an ICAO designator, for instance in the case of self built aeroplanes, the Director General will allocate an official IACM designator.
- (3) When a group type of 5700 kg is reflected on a pilot's license it does not mean that he may readily fly any aeroplane within that group. The pilot would only be allowed to fly those aeroplanes (and systems) within the group that have been endorsed by his instructor in his/her logbook after the appropriate training has been received.
- (4) For maintenance of competency, the pilot may thus conduct the required take-offs and landings in the specific type of aeroplane which has been endorsed in his logbook that he intends to carry passengers on.
- (5) A similar type is considered to be any variant of the type of aeroplane to be used which is included under the same ICAO designator and which has the same systems as the aeroplane in which the flight is to be undertaken.
- (6) The relevant systems applicable are listed below:-
 - (a) Nose wheel-type undercarriage,
 - (b) tail wheel-type undercarriage,
 - (c) retractable undercarriage,
 - (d) carburettor engines,
 - (e) normal-aspirated engines,
 - (f) fuel-injected engines,
 - (g) turbo-and supercharged engines,
 - (h) geared engines,
 - (l) fixed-pitch propellers,
 - (j) variable-pitch and constant speed propellers,
 - (k) pressurisation.

61.06.3 TRAINING (CPL-H)

1. Aim of training course

The aim of the commercial pilot license (helicopter) training course is to train the holder of a commercial pilot license (helicopter) to the level necessary for the issuing of a commercial pilot license (helicopter).

2. Duration, contents and requirements of training course

The applicant must be the holder of a private pilot license (helicopter). The course must be completed within 18 months.

The course comprises -

- (a) a theoretical knowledge course to commercial pilot license (helicopter) knowledge level; and
- (b) visual and instrument flying training.

3. Theoretical knowledge course

The theoretical knowledge course comprises at least 300 hours of instruction, of which 110 hours may be monitored self-study by means of assignments, including formal classroom work, computer-based training, slide/tape presentation, interactive video and learning carrels, where appropriate.

The 300 hours of instruction should preferably be divided as follows:

Subject	Hours instruction	Hours monitored self-study
Air Law and ATC procedures	30	10
Aircraft general knowledge	40	10
Flight performance and planning	45	15
Human performance and limitations	10	5
Meteorology	40	15
Navigation	80	30
Operational procedures	10	5
Principles of flight	25	10
Communications	20	10

4. Theoretical knowledge course syllabus

The theoretical knowledge course syllabus for Commercial Pilot Helicopter is in the Generic Theoretical Knowledge Course Syllabus contained in Technical Standard 61.01.30.

5. Practical training course

Exercise	Sim	Dual	Solo	Acc Total	VFR	S/E or WE
Instrument flight	5	5		10	15	10
Visual flight		15	10	25	15	15
Night flight		5		40		15
Totals	5	25	10	75	30	40

A minimum of 5 hours of the above dual instruction must be carried out in a single- or multi-engine helicopter certified to carry at least 4 persons.

5.1 Visual flight

The 15 hours of visual flight should include the following exercises:

- (1) Pre-flight operations, mass and balance determination, helicopter inspection and servicing;
- (2) take-off, traffic pattern, circuit and landing. Use of checklists, collision avoidance and checking procedures;
- (3) traffic patterns, simulated engine failure during and after take-off;
- (4) maximum performance take-offs and landings;
- (5) crosswind take-offs and landings;
- (6) flight at relatively critical high airspeeds;
- (7) flight at critically slow airspeeds, spin avoidance, recognition and recovery;
- (8) emergencies applicable to type; and
- (9) cross country flying using DR and radio navigation aids.

Flight planning by the applicant, filing of flight plans, evaluation of weather briefing documentation, NOTAM, RT 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 communications failure, weather deterioration, diversion procedures, simulated engine failure during cruise flight and selection of an emergency strip.

If required, the above-mentioned exercises can be carried out in a multi-engine helicopter. However, the applicant should have completed the type and class rating requirements on the multi-engine helicopter to be used for the test prior to commencing this training.

61.06.4 THEORETICAL KNOWLEDGE EXAMINATION (CPL-H)

1. Contents

An applicant for a commercial pilot license (helicopter) must pass a written theoretical knowledge examination on -

- (1) the regulations concerning -
 - (a) conditions relating to flying in Mozambique;
 - (b) licensing requirements applicable to commercial pilots;
 - (c) logbooks and crediting of flight time;
 - (d) rules of the air; flight rules; visual flight rules;
 - (e) instrument flight rules;
 - (f) ground and light signals for aerodrome traffic;
 - (g) air traffic services;
 - (h) search and rescue;
 - (i) taxi rules;
 - (j) investigation of aircraft accidents;
 - (k) requirements applicable to aircraft flying to or from or over Mozambique on other than scheduled international commercial air transport operations;
 - (l) prohibited and restricted areas;
 - (m) knowledge of the following as set out in the AIP, AIP SUP, NOTAM and AIC currently in force:
 - (i) Aeronautical information services available to pilots;
 - (ii) units of measurement;
 - (iii) meteorological information available to pilots;
 - (iv) names and functions of the various air traffic services units and designations of associated airspaces;
 - (v) altimeter setting procedures;
 - (vi) prohibited, restricted and danger areas;
 - (vii) the organisation and operation of the various air traffic services units;
 - (viii) holding, approach and departure procedures;
 - (ix) entry and departure requirements;
 - (x) search and rescue; and
 - (xi) incident reporting procedures;

- (n) flight-time limitations;
- (o) when licensed aerodromes must be used;
- (p) training of flight crew members;
- (2) navigation;
- (3) elementary meteorology; and
- (4) the technical subject prescribed in paragraph 2.

2. General

- (1) Elementary principles of theory of flight, definition of terms, e.g. airflow, forces on an aircraft, straight and level flight, relation between speed and angle of attack, angle of incidence, lift/drag ratio, stability, centre of pressure.
- (2) Properties of air, density, pressure, relationship between pressure, density and temperature, and their effect on aircraft and engine performance, isothermal atmosphere, international standard atmosphere.
- (3) The action to be taken in the event of a serious defect or a heavy landing.
- (4) The principles of operation of engines and their component parts and accessories.
- (5) Direction of movement of controls, principles of operation and function of trimming, servo or balance tabs and alternative devices.
- (6) Elementary knowledge of electricity and magnetism - definition of terms, e.g. volts, amperes, ohms, watts, alternating and direct current, aircraft batteries - charging and functioning.

3. Conducting of theoretical knowledge examination

The written theoretical knowledge examination is conducted by the Director General.

4. Duties of Director General

- (1) The Director General must publish in an AIC -
 - (a) the dates on which examinations are to be written;
 - (b) the latest date by which applications for each such examination are to reach the Director General;
 - (c) the format and duration of each examination; and
 - (d) the fees payable for such examinations.
- (2) The entry fee paid for any examination may, upon request by the candidate, be refunded or transferred to a subsequent examination: Provided that an acceptable reason for such request is furnished.

5. Admission to examinations

Admission to a written theoretical examination is subject to the following conditions:

- (1) An application for admission to the examination must be made on the relevant application form;
- (2) the application must be accompanied by the fee prescribed in Part 187 of the MOZ-CAR;
- (3) the application and fee must be submitted to the Director General, to reach the Director General's office on or before the closing date published for such examination;
- (4) the rules and instructions determined by the Director General for such examination, must be complied with, which rules and instructions must be supplied to a candidate upon his or her admission for a particular examination; and
- (5) a candidate must subject himself or herself to disqualification from future examinations for a period not exceeding 12 months if the rules and instructions referred to in subparagraph (4) are contravened and the candidate will be deemed to have failed the examination in which such contravention occurred.

6. Remarking of examination scripts

- (1) A candidate who has failed one or more examination papers with a mark between 66% and 69%, may on payment of the fee prescribed in Part 187 of the MOZ-CAR, apply for the remarking of the script or scripts concerned.
- (2) Application for the remarking of an examination script or scripts must be made in writing to the Director General, and such application, accompanied by the fee, must reach the Director General not later than one month after the examination results were published.
- (3) The decision of the Director General on any remarked examination script, is final.

61.06.5 SKILL TEST (CPL-H)

1. Procedures and manoeuvres

An applicant for a commercial pilot license (helicopter) must demonstrate the following procedures and manoeuvres:

- (1) Pre-flight procedures
 - (a) Helicopter knowledge.
 - (b) Mass and balance.
 - (c) Performance calculations.
 - (d) Pre-flight inspection.
 - (e) Engine starting.
 - (f) Pre-take-off procedures.
 - (g) Radio procedures.
 - (h) Safety considerations.
- (2) Take-off
 - (a) Pre-take-off briefing.
 - (b) Normal take-off.
 - (c) Crosswind take-off.
 - (d) Engine failure during/after take-off.
 - (e) Safety considerations.
- (3) Departure
 - (a) Aerodrome departure procedures.
 - (b) Accuracy of flight.
 - (c) ATC liaison.
 - (d) Climbing.
 - (e) Climbing turns.
 - (f) Levelling off.
 - (g) Safety considerations.
- (4) General flying
 - (a) Straight and level.
 - (b) Steep turns left and right;
 - (ii) flight at minimum speed;
 - (iii) stall (clean) recovery with power;

- (iv) stall (clean) recovery without power;
- (v) stall in approach configuration (with power);
- (vi) level flight cruise;
- (vii) climbing and descending turns;
- (viii) recovery from unusual attitudes.

Note: Exercise (vi) to (vii) not for valid instrument rating holders.

- (c) Forced landing without power.
 - (d) Precautionary landing.
 - (e) Radio procedures.
 - (f) Safety considerations.
- (5) Arrival and landing procedures
- (a) Aerodrome arrival procedures.
 - (b) Short field landing.
 - (c) Crosswind landing.
 - (d) ATC procedures.
 - (e) Safety considerations.
- (6) Navigation
- (a) Navigation log/plan.
 - (b) Flight plan.
 - (c) Maintenance of altitude and heading.
 - (d) Map reading.
 - (e) Revision of ETA.
 - (f) Log keeping.
 - (g) Use of radio navigation aids (position fix).
 - (h) Tracking, positioning (NDB + VOR).
 - (i) Fuel/engine management.
 - (j) Systems and carburettor icing checks.
 - (k) ATC procedures and altimeter setting.
 - (l) Safety considerations.
- (7) Action after flight
- (a) Shut down procedures.
 - (b) Securing procedures.
 - (c) Post flight inspection.
 - (d) Safety considerations.

- (8) Multi-engine flight (if applicable)

Note: This section may be combined with sections (1) - (7).

The control of the aeroplane and correct actions must be evaluated during the following situations:

- (a) Simulated engine failure (take-off).
- (b) Simulated engine failure (approach).
- (4) flight planning and mass and balance problems appropriate to the type of helicopter used for the test.

2. Conducting the skill test

The skill test must be conducted by a designated examiner.

The skill test must be preceded by an oral examination on, but not limited to –

- (1) normal, abnormal and emergency procedures;
- (2) limitations;
- (3) systems knowledge; and
- (4) the applicable Air Law, where appropriate.

3. Skill test report

- (1) Completion

The designated examiner conducting the skill test must complete the skill test report number MZ 61-32, which is available from the Director General.

- (2) Assessment

All the procedures and manoeuvres must be assessed as indicated on the test form.

61.06.6 APPLICATION FOR COMMERCIAL PILOT LICENSE (CPL-H)

1. Form of application

The application form for the issuing of a commercial pilot license (helicopter), is form MZ 61-03, which is available from the Director General.

2. Skill test report

The skill test report that must accompany an application for the issuing of a commercial pilot license (helicopter), is form number MZ 61-32 which is available from the Director General.

61.06.7 ISSUING OF COMMERCIAL PILOT LICENSE (CPL-H)

1. Form of license

A commercial pilot license (helicopter) is issued on the form determined by the Director General.

61.06.11 MAINTENANCE OF COMPETENCY (CPL-H)

1. Type or similar type of helicopter

- (1) The helicopter type (name) shall mean the ICAO designator allocated to that specific type of helicopter as contained in Doc 8643. For instance, a Robinson 22 helicopter will be reflected as a R22.
- (2) In absence of an ICAO designator, for instance in the case of self built helicopter, the Director General will allocate an official IACM designator.
- (3) A helicopter type is reflected on a pilot's license and endorsed in the pilot's logbook by the instructor after the appropriate training has been received.
- (4) For maintenance of competency, the pilot may thus conduct the required circuits and landings in the specific type of helicopter which is reflected on his license that he intends to carry passengers on.
- (5) A similar type is considered to be any variant of the type of helicopter to be used which is included under the same ICAO designator and which has the same systems as the helicopter on which the flight is to be undertaken.
- (6) In cases where there are differences between helicopters under a specific name, it is the responsibility of the pilot to be acquainted with such differences. Where such differences are of a major nature, such as a substantial difference in for instance the power-plant, the pilot is to acquaint himself thoroughly with such difference and fly with an instructor and on completion have his logbook certified by the instructor.

61.07.2 EXPERIENCE (MULTI-CREW PILOT)

1. Level of Experience for turbine powered aircraft

The multi-crew pilot has to demonstrate the following competencies as a crew member in a turbine powered aircraft:

- (1) Conduct aircraft start up procedure.
- (2) Taxi the aircraft.
- (3) Fly the aircraft in accordance with the prescribed traffic pattern requirements.
- (4) Fly or assist with visual arrival and departure procedures.
- (5) Fly and manage or assist to fly and manage the aircraft during climbing manoeuvres by visual reference.
- (6) Fly and manage or assist to fly and manage the aircraft during straight and level phase of flight by visual reference within general flight tolerances
- (7) Fly and manage or assist to fly and manage the aircraft during descending manoeuvres by visual reference within general flight tolerances.
- (8) Fly and manage or assist to fly and manage the aircraft during turning manoeuvres by visual reference within general flight tolerances
- (9) Manage equipment and system malfunctions during actual and/or simulated flight operations.
- (10) Simulate the use of emergency equipment during actual and/or simulated flight operations
- (11) Manage simulated emergency situations during actual and/or simulated flight operations.
- (12) Manage simulated non-normal situations during actual and or simulated flight operations.
- (13) Manage aircraft environment.
- (14) Manage aircraft and aircraft systems
- (16) Perform take-offs during real and or simulated flight operations
- (17) Perform landings during real and or simulated flight operations
- (18) Perform go-arounds during real and or simulated flight operations
- (19) Manoeuvre aeroplane during slow flight during real and or simulated flight operations
- (20) Perform approaches to stalls and stall recovery during real and or simulated flight operations
- (21) Recover from incipient spins (Only to be done in a simulator)

- (22) Describe the phenomenon and recovery from full spin
- (23) Turn aeroplane steeply during real and or simulated flight operations
- (24) Side slip an aeroplane during real and or simulated flight operations
- (25) Recover from spiral dive during real and or simulated flight operations
- (26) Use information to plan an Instrument Flight Rules (IFR) flight
- (27) Produce plans for the flight.
- (28) Fly the aeroplane with one engine inoperative.
- (29) Perform normal instrument flight manoeuvres within specified tolerances.
- (30) Recover from unusual flight attitudes by sole reference to instruments.
- (31) Manage failure of flight instruments.

61.07.3 TRAINING (MULTI-CREW PILOT)

1. Aim of training course

The aim of the multi-crew pilot license (aeroplane) training course is to train the holder of a multi-crew pilot license (aeroplane) to the level necessary for the issuing of a multi-crew pilot license (aeroplane).

2. Duration, contents and requirements of training course

The applicant must be the holder of a multi-crew pilot license (aeroplane). The course must be completed within 18 months.

The course comprises -

- (a) a theoretical knowledge course to multi-crew pilot license (aeroplane) knowledge level; and
- (b) visual and instrument flying training.

3. Theoretical knowledge course

The theoretical knowledge course comprises at least 350 hours of instruction, of which 150 hours may be monitored self-study by means of assignments, including formal classroom work, computer-based training, slide/tape presentation, interactive video and learning scenarios, where appropriate.

The 350 hours of instruction should preferably be divided as follows:

Subject	Hours instruction	Hours monitored self-study
Air Law and ATC procedures	40	15
Aircraft general knowledge	50	15
Flight performance and planning	55	20
Human performance and limitations	10	5
Meteorology	50	25
Navigation	90	45
Operational procedures	10	5
Principles of flight	25	10
Communications	20	10

4. Theoretical knowledge course syllabus

The theoretical knowledge course syllabus for Multi-crew Aeroplane Pilots is in the Generic Theoretical Knowledge Course Syllabus contained in Technical Standard 61.01.30.

5. Practical training course

Exercise	Sim	Dual	Solo	Acc Total	VFR	IFR	S/E or M/E
Instrument flight	5	5		10	15	10	10
Visual flight		15	10	25	15		15
Night flight		5		5			15
Totals	5	25	10	40	30	10	40

A minimum of 25 hours of the above dual instruction must be carried out in a simulator approved by the Director General for this purpose or a multi-crew multi-engine aeroplane certified to carry at least 9 persons. The aeroplane must be fitted with variable pitch propellers and retractable landing gear or turbine engines.

5.1 Visual flight

The 15 hours of dual visual flight should include the following exercises:

- (1) Pre-flight operations, mass and balance determination, aeroplane inspection and servicing;
- (2) take-off, traffic pattern, approach and landing. Use of checklists, collision avoidance and checking procedures;
- (3) traffic patterns, simulated engine failure during and after take-off;
- (4) maximum performance take-offs and short field landings;
- (5) crosswind take-offs and landings and go-arounds;
- (6) flight at relatively critical high airspeeds, recognition and recovery from spiral dives;
- (7) flight at critically slow airspeeds, spin avoidance, recognition of and recovery from incipient and full stalls;
- (8) incipient and full spins applicable to type; and
- (9) cross country flying using DR and radio navigation aids.
- (10) Flight planning by the applicant, filing of flight plans, evaluation of weather briefing documentation, NOTAM, RT 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 communications failure, weather deterioration, diversion procedures, simulated engine failure during cruise flight and selection of an emergency strip.

5.2 Instrument flight

The 10 hours of instrument flight should comprise the following:

- (1) Basic attitude flying;
- (2) climbing descending, maintaining heading and speed, transition to horizontal flight, climbing and descending turns;
- (3) instrument pattern
 - (a) Decelerate to approach speed, flaps to approach configuration;
 - (b) initiate a standard turn left or right;
 - (c) roll out on opposite heading and maintain for 1 minute;
 - (d) standard turn with the gear down descend at 500 fpm;
 - (e) roll out on initial heading and descend at 500 fpm on this heading for 1 minute;
 - (f) transition to level flight 1 000 ft below initial altitude;
 - (g) initiate a go-around; and
 - (h) climb at best rate of climb speed;
- (4) repeat the exercise on basic attitude flying together with 45° of bank and recovery from unusual attitudes;
- (5) repeat exercise 4 of paragraph 5.1 again;
- (6) radio navigation using the VOR,
- (7) NDB and intercepting bearings to and from navigation stations (QDM and QDR);
- (8) repeat exercise 3 of paragraph 5.1 and recovery from unusual attitudes;
- (9) repeat basic attitude flying with turns and simulated A/H and DI failure (limited panel); recognition of and recovery from incipient and stalls;
- (10) recognition of and recovery from incipient spins, if applicable to type; and
- (11) repeat exercises where problems were observed.

The above-mentioned exercises must be carried out in a multi-engine aeroplane or a simulator, therefore, the applicant should have completed the type and class rating requirements on the multi-engine aeroplane to be used for the test prior to commencing this training.

61.07.4 THEORETICAL KNOWLEDGE EXAMINATION (MULTI-CREW PILOT)

1. Contents

An applicant for a multi-crew pilot license (aeroplane) must pass a written theoretical knowledge examination on -

- (1) the regulations concerning -
 - (a) conditions relating to flying in Mozambique;
 - (b) licensing requirements applicable to commercial pilots;
 - (c) logbooks and crediting of flight time;
 - (d) rules of the air; flight rules; visual flight rules;
 - (e) instrument flight rules;
 - (f) ground and light signals for aerodrome traffic;
 - (g) air traffic services;
 - (h) search and rescue;
 - (i) taxi rules;
 - (j) investigation of aircraft accidents;
 - (k) requirements applicable to aircraft flying to or from or over Mozambique on other than scheduled international commercial air transport operations;
 - (l) prohibited and restricted areas;
 - (m) knowledge of the following as set out in the AIP, AIP SUP, NOTAM and AIC currently in force:
 - (i) Aeronautical information services available to pilots;
 - (ii) units of measurement;
 - (iii) meteorological information available to pilots;
 - (iv) names and functions of the various air traffic services units and designations of associated airspace;
 - (v) altimeter setting procedures;
 - (vi) prohibited, restricted and danger areas;
 - (vii) the organisation and operation of the various air traffic services units;
 - (viii) holding, approach and departure procedures;
 - (ix) entry and departure requirements;

- (x) search and rescue; and
 - (xi) incident reporting procedures;
- (n) flight-time limitations;
- (o) when licensed aerodromes must be used;
- (p) training of flight crew members;
- (2) navigation;
- (3) elementary meteorology; and
- (4) the technical subjects prescribed in paragraph 2.

2. General

- (1) Elementary principles of theory of flight, definition of terms, e.g. airflow, forces on an aircraft, straight and level flight, relation between speed and angle of attack, angle of incidence, lift/drag ratio, stability, centre of pressure, flaps and slots.
- (2) Properties of air, density, pressure, relationship between pressure, density and temperature, and their effect on aircraft and engine performance, isothermal atmosphere, international standard atmosphere.
- (3) The action to be taken in the event of a serious defect or a heavy landing.
- (4) The principles of operation of engines and their component parts and accessories.
- (5) Definition of the terms associated with propellers, function of constant speed, fully feathering and braking propellers.
- (6) Direction of movement of controls, principles of operation and function of trimming, servo or balance tabs and alternative devices.
- (7) Elementary knowledge of electricity and magnetism - definition of terms, e.g. volts, amperes, ohms, watts, alternating and direct current, aircraft batteries - charging and functioning.

3. Conducting of theoretical knowledge examination

The written theoretical knowledge examination is conducted by the Director General.

4. Duties of Director General

- (1) The Director General must publish in an AIC -
 - (a) the dates on which examinations are to be written;
 - (b) the latest date by which applications for each such examination are to reach the Director General;

- (c) the format and duration of each examination; and
 - (d) the fees payable for such examinations.
- (2) The entry fee paid for any examination may, upon request by the candidate, be refunded or transferred to a subsequent examination: Provided that an acceptable reason for such request is furnished.

5. Admission to examinations

Admission to a written theoretical examination is subject to the following conditions:

- (1) An application for admission to the examination must be made on the relevant application form;
- (2) the application must be accompanied by the fee prescribed in Part 187 of the MOZ-CAR;
- (3) the application and fee must be submitted to the Director General, to reach the Director General's office on or before the closing date published for such examination;
- (4) the rules and instructions determined by the Director General for such examination, must be complied with, which rules and instructions must be supplied to a candidate upon his or her admission for a particular examination; and
- (5) a candidate must subject himself or herself to disqualification from future examinations for a period not exceeding 12 months if the rules and instructions referred to in subparagraph (4) are contravened and the candidate will be deemed to have failed the examination in which such contravention occurred.

6. Remarking of examination scripts

- (1) A candidate who has failed one or more examination papers with a mark between 66% and 69%, may on payment of the fee prescribed in Part 187 of the MOZ-CAR, apply for the remarking of the script or scripts concerned.
- (2) Application for the remarking of an examination script or scripts must be made in writing to the Director General, and such application, accompanied by the fee, must reach the Director General not later than one month after the examination results were published.
- (3) The decision of the Director General on any remarked examination script, is final.

61.07.5 SKILL TEST (MULTI-CREW PILOT)

1. Competency Requirements

1.1 The applicant for a multi-crew pilot license (aeroplane) must demonstrate his/her ability to perform the competencies as set out in Technical Standard 61.07.2.

1.2 An applicant for a multi-crew pilot license (aeroplane) must demonstrate his/her ability to perform the following procedures and manoeuvres as the co-pilot of an aircraft to be operated by a multi-crew:

(1) Pre-flight procedures

- (a) Aeroplane knowledge.
- (b) Mass and balance.
- (c) Performance calculations.
- (d) Attention to weather and minima.
- (e) Pre-flight inspection.
- (f) Engine starting.
- (g) Pre-taxi checks.
- (h) Taxi checks.
- (i) Pre-take-off procedures.
- (j) ATC/radio procedures.
- (k) Safety considerations.

(2) Take-off

- (a) Pre-take-off briefing.
- (b) Normal take-off.
- (c) Rolling take-off.
- (d) Crosswind take-off.
- (e) After take-off checks.
- (f) Rejected take-off before V1.
- (g) Engine failure between V1 and V2.
- (h) Instrument flying accuracy.
- (i) Safety considerations.

Note: 1. Exercises (2) (f) and (g) must be conducted in a full flight simulator. In the case of aeroplanes for which no full flight simulator is available it is important to note that in aeroplanes with a limited performance the engine failure must not be initiated until at least 500 ft above the runway end. In aeroplanes with transport category performance (TS 21.02.3(4)) the engine failure may be simulated shortly

after reaching V2. The rejected take-off exercise prior to VI must be initiated at a speed that will ensure that safety is not adversely affected. Exercise (2)(h) and (i) may be carried out in the aeroplane taking the abovementioned issues into account

(3) Departure

- (a) Compliance with SID/ATC clearance.
- (b) Identification of aids⁷altimeter setting.
- (c) Instrument flying accuracy.
- (d) ATC liaison.
- (e) Climbing.
- (f) Climbing turns.
- (g) Levelling off.
- (h) Safety considerations.

(4) General handling

- (a) Straight and level.
- (b) Steep turns (45⁰ bank) left and right.
- (c) Turns with and without spoilers.
- (d) Flight at minimum speed.
- (e) Stall (clean) recovery with power.
- (f) Stall (clean) recovery without power.
- (g) Stall in approach configuration (with power).
- (h) Mach buffet and tuck.
- (i) Dutch roll.
- (j) Level flight cruise.
- (k) Climbing and descending turns.
- (l) Recovery from unusual attitudes.
- (m) Ice protection procedures (simulated if required).
- (n) Tracking NDB/VOR/RNAV.
- (o) Radio procedures.
- (p) Safety considerations.

(5) Normal and abnormal operations of systems

- (a) Air conditioning/pressurisation.
- (b) Anti/de-icing.
- (c) APU.
- (d) Auto-pilot Flight Director system.
- (e) Electrical system.

- (f) Engine/propeller
- (g) Flaps and slats.
- (h) Flight management system.
- (i) Flight controls and trim system.
- (j) Fuel system.
- (k) GPWS.
- (l) Hydraulic system.
- (m) Landing gear.
- (n) Pitot/static failure.
- (o) Radio altimeter.
- (p) Radios, navigation equipment.
- (q) Stall warning devices.
- (r) TCAS.
- (s) Transponder.
- (t) Weather radar.

(6) Navigation

- (a) Navigation log/plan.
- (b) Revision of ETA.
- (c) Log keeping.
- (d) Accuracy of navigation.
- (e) Accuracy of instrument flying.
- (f) ATC procedures and altimeter setting.
- (g) Safety considerations.

(7) Abnormal and emergency procedures

At least 4 of the following procedures must be examined:

- (a) Engine fire.
- (b) Engine failure.
- (c) APU fire/Cabin fire.
- (d) Cargo fire/Flight deck fire.
- (e) Electrical fire.
- (f) Wing fire.
- (g) Smoke control and removal.
- (h) Fuel dumping procedures.
- (i) Windshear.

- (j) Depressurization and emergency descent.
 - (k) Incapacitation.
 - (l) Other emergency or abnormal procedures.
- (8) Non-precision approach
- (a) Identification of aids/altimeter setting.
 - (b) Approach and landing briefing.
 - (c) Approach and landing checks.
 - (d) Holding.
 - (e) Compliance with published procedure.
 - (f) Approach timing.
 - (g) Instrument flying accuracy.
 - (h) ATC liaison and compliance.
 - (i) Icing procedures (simulated if required).
 - (j) Safety considerations.
- (9) Precision approach
- (a) Aerodrome arrival procedures/STARS. Identification of aids/altimeter setting. Approach and landing briefing. Descent/approach/landing checks. Holding.
 - (b) Manual approach with Flight Director. Manual approach without Flight Director. Autopilot approach. Go-around from DA (200 ft).
 - (c) Missed approach procedure. ATC procedures/compliance.
 - (d) Safety considerations.
- Note: In aeroplanes with limited performance the engine inoperative go-around must be initiated not later than 500 feet AGL.
- (10) Circle to land
- (a) Approach to circling minima.
 - (b) Circling approach to another runway.
 - (c) Go-around from the circling approach.
- (11) Minimum visibility operations (Cat II and III)
- (a) Approach take-off (RVR minimum authorized).
 - (b) Engine failure after V1 (RVR=Min.).
 - (c) CAT II/III ILS/MLS approach to minima. Go-around (manual).
 - (d) Go-around (autopilot).

- (e) Go-around (visual ref. inadequate).
- (f) Full auto approach and landing.
- (12) Landings
 - (a) Normal landing.
 - (b) Crosswind landing.
 - (c) Landing with minimum flaps/slats.
 - (d) Landing with critical engine inoperative (Simulated or in a full flight simulator)
- (13) Action after flight
 - (a) Shut down procedures.
 - (b) Securing procedures.
 - (c) Post flight inspection.
 - (d) Safety considerations.
- (14) General
 - (a) Decision making ability.
 - (b) Overall safety considerations.
 - (c) General smoothness and coordination.
 - (d) Ability to plan ahead.
 - (e) Overall impression.

Note 2: Either exercise (8) or (9) is to be flown with one engine inoperative.

Note 3: Exercise 12 must be performed in a full flight simulator with an approved visual system.

1.3 The procedures and manoeuvres must include -

- (1) the co-piloting of an aeroplane or simulator approved for the purpose, satisfactorily in all manoeuvres used in normal flight;
- (2) the execution of emergency manoeuvres which may include simulated forced landings and recovery from stalls entered from both level and steeply banked attitudes;
- (3) the operation of multi-engine aeroplanes at maximum permissible landing mass with one engine inoperative;
- (4) the execution of all normal manoeuvres, solely by means of instruments, including stalls, spirals and level turns of not less than 180 degrees in a banked attitude of not less than 45 degrees, followed by a turn in the reversed direction;

- (5) the operation of multi-engine aeroplanes solely by reference to instruments at maximum permissible landing mass with one engine inoperative;
- (6) while operating the aeroplane under actual or simulated instrument flight conditions, the carrying out of orientation and approach procedures by using radio aids, and to give any other demonstration of skill required for the instrument rating;
- (7) the execution of all other manoeuvres which may be essential to establish his competency;
- (8) the carrying out of the tests detailed in subparagraphs (2), (3) and (5) in an aeroplane or simulator approved for the purpose, in the class for which, a rating is sought and where the rating is sought for an aeroplane having a maximum certificated mass exceeding 5 700 kg, in the type of aeroplane for which the rating is sought; and meeting the requirements for the issuing of an instrument rating: Provided that any manoeuvres required during the course of the tests, detailed in subparagraphs (1) to (8), may be modified or excluded by the examiner if such manoeuvres are inadvisable for the type of aeroplane used in the tests.

2. Conducting the skill test

- (1) The skill test must be conducted by a designated examiner.
- (2) The skill test must be preceded by an oral examination on, but not limited to -
 - (a) normal, abnormal and emergency procedures;
 - (b) limitations;
 - (c) systems knowledge; and
 - (d) the applicable Air Law, where appropriate

3. Skill test report (1) Completion

- (1) The designated examiner conducting the skill test must complete the skill test report contained in form MZ 61-37, which is available from the Director General.

4. Assessment

- (1) All the procedures and manoeuvres must be assessed as indicated on the test form.

61.07.6 APPLICATION FOR MULTI-CREW PILOT LICENSE

1. Form of application

The application form for the issuing of a multi-crew pilot license is form MZ 61-11, which is available from the Director General.

2. Skill test report

The skill test report that must accompany an application for the issuing of a multi-crew pilot license is form number MZ 61-37 which is available from the Director General.

61.07.7 ISSUING OF MULTI-CREW PILOT LICENSE

1. Form of license

A multi-crew pilot license is issued on the form determined by the Director General.

61.07.11 MAINTENANCE OF COMPETENCY (MULTI-CREW PILOT)

1. Type or similar type of aeroplane

- (1) The aeroplane type (name) shall mean the ICAO designator allocated to that specific type of aeroplane as contained in Doc 8643. For instance, a Boeing 737 aeroplane will be reflected as a B73.
- (2) In absence of an ICAO designator, for instance in the case of self built aeroplanes, the Director General will allocate an official IACM designator.
- (3) When a group type of 5700 kg is reflected on a pilot's license it does not mean that he may readily fly any aeroplane within that group. The pilot would only be allowed to fly those aeroplanes (and systems) within the group that have been endorsed by his instructor in his/her logbook after the appropriate training has been received.
- (4) For maintenance of competency, the pilot may thus conduct the required take-offs and landings in the specific type of aeroplane which has been endorsed in his logbook that he intends to carry passengers on.
- (5) A similar type is considered to be any variant of the type of aeroplane to be used which is included under the same ICAO designator and which has the same systems as the aeroplane in which the flight is to be undertaken.
- (6) The relevant systems applicable are listed below:-
 - (a) Nose wheel-type undercarriage,
 - (b) tail wheel-type undercarriage,
 - (c) retractable undercarriage,
 - (d) carburettor engines,
 - (e) normal-aspirated engines,
 - (f) fuel-injected engines,
 - (g) turbo-and supercharged engines,
 - (h) geared engines,
 - (i) fixed-pitch propellers,
 - (j) variable-pitch and constant speed propellers,
 - (k) pressurisation.

61.08.3 TRAINING (ATP-A)

1. Aim of training course

The aim of the airline transport pilot license (aeroplane) training course is to train the holder of an airline transport pilot license (aeroplane) to the level necessary for the issuing of an airline transport pilot license (aeroplane).

2. Duration, contents and requirements of training course

The applicant must be the holder of an airline transport pilot license (aeroplane). The course must be completed within 18 months.

The course comprises -

- (a) a theoretical knowledge course to airline transport pilot license (aeroplane) knowledge level; and
- (b) visual and instrument flying training.

3. Theoretical knowledge course

The theoretical knowledge course comprises at least 750 hours of instruction, of which 250 hours may be monitored self-study by means of assignments, including formal classroom work, computer-based training, slide/tape presentation, interactive video and learning scenarios where appropriate.

The 750 hours of instruction shall 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

4. Theoretical knowledge course syllabus

The theoretical knowledge course syllabus for Airline Transport Aeroplane Pilots is in the Generic Theoretical Knowledge Course Syllabus contained in Technical Standard 61.01.30.

5. Practical training course

- (1) The flying training, not including type rating training, shall comprise a total of at least 195 hours, to include all progress tests, of which up to 55 hours for the

entire course may be instrument ground time. Within the total of 195 hours, applicants shall complete at least:

- (a) 95 hours of dual instruction of which up to 55 hours may be instrument ground time;
 - (b) 100 hours as pilot-in-command including 50 hours VFR flight and 50 hours instrument flight time as student pilot-in-command (SPIC). (SPIC time shall be credited as pilot-in-command time, unless the flight instructor had to influence or control any part of the flight. A ground de-briefing by the flight instructor does not affect the crediting as pilot-in-command time);
 - (c) 50 hours of cross-country flight as pilot-in-command including a VFR cross-country flight totalling at least 540 km (300 NM) in the course of which full stop landings at two aerodromes different from the aerodrome of departure shall be made;
 - (d) 5 hours flight time in aeroplanes shall be completed at night comprising 3 hours of dual instruction including at least 1 hour of cross-country navigation and 5 solo take-offs and 5 solo full stop landings; and
 - (e) 115 hours of instrument time comprising –
 - (i) 50 hours of instrument flight instruction of which up to 25 hours may be instrument ground time in a simulator which is approved for that purpose by the Director General.
 - (ii) 50 hours as SPIC; and
 - (iii) 15 hours multi-crew co-operation, for which a simulator approved by the Director General for that purpose may be used.
- (2) Multi-crew co-operation:

On completion of the MCC training the applicant shall either demonstrate the ability to perform the duties of a pilot on a multi-pilot aeroplane by passing the type rating skill test on multi-pilot aeroplanes or shall be given a certificate of completion of MCC.

MCC training must include training in instances of crew-incapacitation.

- (3) Flying Instruction Phases

The flying instruction is divided into five phases -

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 slow airspeeds, recognition of and recovery from incipient and full stalls, spin avoidance; and
- (f) unusual attitudes and simulated engine failure.

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) non-normal 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).

Phase 3

Exercises up to the VFR navigation progress test comprise a total of at least 5 hours of dual instruction and at least 40 hours as pilot-in-command.

The dual instruction and testing up to the VFR navigation progress test shall 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 who did not participate in the applicant's training.

Phase 4

Exercises up to the instrument rating skill test comprise:

- (a) at least 55 hours of instrument flight time of which not more than 25 hours may be completed in an approved simulator
- (b) 50 hours instrument time flown as SPIC;
- (c) night flight including take-offs and landings as pilot-in-command;
- (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;
- (e) procedures and manoeuvres for IFR operation under normal, abnormal and emergency conditions covering at least -
- (f) transition from visual to instrument flight on take-off;
- (g) standard instrument departures and arrivals;
- (h) en route IFR procedures;
- (i) holding procedures;
- (j) instrument approaches to specified minima;
- (k) missed approach procedures;
- (l) landings from instrument approaches, including circling;
- (m) in-flight manoeuvres and specific flight characteristics; and
- (n) operation of a multi-engine aeroplane in the exercises of paragraph 5(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 shall be at a safe altitude unless carried out in a simulator).

Phase 5

Instruction and testing in multi-crew co-operation (MCC).

61.08.4 THEORETICAL KNOWLEDGE EXAMINATION (ATP-A)

1. Contents

An applicant for an airline transport pilot license (aeroplane) must pass a written theoretical knowledge examination on the regulations concerning -

- (a) conditions relating to flying in MOZAMBIQUE;
- (b) licensing requirements applicable to airline transport pilots;
- (c) logbooks and crediting of flight time;
- (d) rules of the air; flight rules; visual flight rules;
- (e) instrument flight rules;
- (f) ground and light signals for aerodrome traffic;
- (g) air traffic services;
- (h) search and rescue;
- (i) taxi rules;
- (j) investigation of aircraft accidents;
- (k) requirements applicable to aircraft flying to or from or over Mozambique on other than scheduled international commercial air transport operations;
- (l) prohibited and restricted areas;
- (m) knowledge of the following as set out in the AIP, AIP SUP, NOTAM and AIC currently in force:
 - (i) aeronautical information services available to pilots;
 - (ii) units of measurement;
 - (iii) meteorological information available to pilots;
 - (iv) names and functions of the various air traffic services units and designations of associated airspace;
 - (v) altimeter setting procedures; and
 - (vi) prohibited, restricted and danger areas;
 - (vii) the organisation and operation of the various air traffic services units;
 - (viii) holding, approach and departure procedures;
 - (ix) entry and departure requirements;
 - (x) search and rescue; and
 - (xi) incident reporting procedures;
- (n) flight-time limitations;
- (o) when licensed aerodromes must be used;
- (p) training of flight crew members;

- (q) flight operation;
- (r) aeronautical charts and the form of the earth;
- (s) flight navigation;
- (t) radio aids to navigation;
- (u) aeronautical instruments;
- (v) meteorology; and
- (w) the technical subjects prescribed in paragraph 2 (General).

2. General

- (1) Elementary principles of theory of flight, definition of terms, e.g. airflow, forces on an aeroplane straight and level flight, relation between speed and angle of attack, angle of incidence, lift/drag ratio, stability, centre of pressure, flaps and slots.
- (2) Properties of air, density, pressure, relationship between pressure, density and temperature, and their effect on aircraft and engine performance, isothermal atmosphere, international standard atmosphere.
- (3) The principles of operation of engines and their component parts and accessories.
- (4) Definition of the terms associated with propellers, function of constant speed, fully feathering and braking propellers.
- (5) Definition of the terms associated with turbojet and turbo-propeller aircraft.
- (6) The action to be taken in the event of a serious defect or a heavy landing.
- (7) Direction of movement of controls, principles of operation and function of trimming, servo or balance tabs and alternative devices.
- (8) Elementary knowledge of electricity and magnetism - definition of terms, e.g. volts, amperes, ohms, watts, alternating and direct current, aircraft batteries - charging and functioning.

3. Conducting of theoretical knowledge examination

The written theoretical knowledge examination is conducted by the Director General.

4. Duties of Director General

- (1) The Director General must publish in an AIC -
 - (a) the dates on which examinations are to be written;
 - (b) the latest date by which applications for each such examination are to reach the Director General;
 - (c) the format and duration of each examination; and
 - (d) the fees payable for such examinations.

- (2) The entry fee paid for any examination may, upon request by the candidate, be refunded or transferred to a subsequent examination: Provided that an acceptable reason for such request is furnished.

5. Admission to examinations

Admission to a written theoretical examination is subject to the following conditions:

- (1) An application for admission to the examination must be made on the relevant application form;
- (2) the application must be accompanied by the fee prescribed in Part 187 of the MOZ-CAR;
- (3) the application and fee must be submitted to the Director General, to reach the Director General's office on or before the closing date published for such examination;
- (4) the rules and instructions determined by the Director General for such examination, must be complied with, which rules and instructions must be supplied to a candidate upon his or her admission for a particular examination; and
- (5) a candidate must subject himself or herself to disqualification from future examinations for a period not exceeding 12 months if the rules and instructions referred to in subparagraph (4) are contravened and the candidate will be deemed to have failed the examination in which such contravention occurred.

6. Marking of examination scripts

- (1) A candidate who has failed one or more examination papers with a mark between 66% and 69%, may on payment of the fee prescribed in Part 187 of the MOZ-CAR, apply for the remarking of the script or scripts concerned.
- (2) Application for the remarking of an examination script or scripts must be made in writing to the Director General, and such application, accompanied by the fee, must reach the Director General not later than one month after the examination results were published.
- (3) The decision of the Director General on any remarked examination script is final.

61.08.5 SKILL TEST (ATP-A)

1. Procedures and manoeuvres**1.1 An applicant for an airline transport pilot license (aeroplane) must demonstrate the following procedures and maneuvers:**

- (1) Pre-flight procedures
 - (a) Aeroplane knowledge.
 - (b) Mass and balance.
 - (c) Performance calculations.
 - (d) Attention to weather and minima.
 - (e) Pre-flight inspection.
 - (f) Engine starting.
 - (g) Pre-taxi checks.
 - (h) Taxi checks.
 - (i) Pre-take-off procedures.
 - (j) ATC/radio procedures.
 - (k) Safety considerations.
- (2) Take-off
 - (a) Pre-take-off briefing.
 - (b) Normal take-off.
 - (c) Rolling take-off.
 - (d) Crosswind take-off.
 - (e) After take-off checks.
 - (f) Rejected take-off before V1.
 - (g) Engine failure between V1 and V2.
 - (h) Engine failure after V2.
 - (i) Rejected take-off before V1.
 - (l) Instrument flying accuracy.
 - (m) Safety considerations.
- (3) Departure
 - (a) Compliance with SID/ATC clearance.
 - (b) Identification of aids⁷altimeter setting.
 - (c) Instrument flying accuracy.

- (d) ATC liaison.
 - (e) Climbing.
 - (f) Climbing turns.
 - (g) Levelling off.
 - (h) Safety considerations.
- (4) General handling
- (a) Straight and level.
 - (b) Steep turns (450 bank) left and right.
 - (c) Turns with and without spoilers.
 - (d) Flight at minimum speed.
 - (e) Stall (clean) recovery with power.
 - (f) Stall (clean) recovery without power.
 - (g) Stall in approach configuration (with power).
 - (h) Mach buffet and tuck.
 - (i) Dutch roll.
 - (j) Level flight cruise.
 - (k) Climbing and descending turns.
 - (l) Recovery from unusual attitudes.
 - (m) Ice protection procedures (simulated if required).
 - (n) Tracking NDB/VOR/RNAV.
 - (o) Radio procedures.
 - (p) Safety considerations.
- (5) Normal and abnormal operations of systems
- (a) Air conditioning/pressurisation.
 - (b) Anti/de-icing.
 - (c) APU.
 - (d) Auto-pilot Flight Director system.
 - (e) Electrical system.
 - (f) Engine/propeller
 - (g) Flaps and slats.
 - (h) Flight management system.
 - (i) Flight controls and trim system.
 - (j) Fuel system.
 - (k) GPWS.
 - (l) Hydraulic system.

- (m) Landing gear.
 - (n) Pitot/static failure.
 - (o) Radio altimeter.
 - (p) Radios, navigation equipment.
 - (q) Stall warning devices.
 - (r) TCAS.
 - (s) Transponder.
 - (t) Weather radar.
- (6) Navigation
- (a) Navigation log/plan.
 - (b) Revision of ETA.
 - (c) Log keeping.
 - (d) Accuracy of navigation.
 - (e) Accuracy of instrument flying.
 - (f) ATC procedures and altimeter setting.
 - (g) Safety considerations.
- (7) Abnormal and emergency procedures
- At least 4 of the following procedures must be examined:
- (a) Engine fire.
 - (b) Engine failure.
 - (c) APU fire. Cabin fire.
 - (d) Cargo fire Flight deck fire.
 - (e) Electrical fire.
 - (f) Wing fire.
 - (g) Smoke control and removal.
 - (h) Fuel dumping procedures.
 - (i) Windshear.
 - (j) Depressurisation and emergency descent.
 - (k) Incapacitation.
 - (l) Other emergency or abnormal procedures.
- (8) Non-precision approach
- (a) Identification of aids/altimeter setting.
 - (b) Approach and landing briefing.
 - (c) Approach and landing checks.

- (d) Holding.
 - (e) Compliance with published procedure.
 - (f) Approach timing.
 - (g) Instrument flying accuracy.
 - (h) ATC liaison and compliance.
 - (i) Icing procedures (simulated if required).
 - (j) Safety considerations.
- (9) Precision approach
- (a) Aerodrome arrival procedures/STARS. Identification of aids/altimeter setting. Approach and landing briefing. Descent/approach/landing checks. Holding.
 - (b) Manual approach with Flight Director. Manual approach without Flight Director. Autopilot approach. Go-around from DA (200 ft).
 - (c) Missed approach procedure. ATC procedures/compliance.
 - (d) Safety considerations.

Note: In aeroplanes with limited performance the engine inoperative go-around must be initiated not later than 500 feet AGL.

- (10) Circle to land
- (a) Approach to circling minima.
 - (b) Circling approach to another runway.
 - (c) Go-around from the circling approach.
- (11) Minimum visibility operations (Cat II and III)
- (a) Approach take-off (RVR minimum authorized).
 - (b) Engine failure after V1 (RVR=Min.).
 - (c) CAT II/III ILS/MLS approach to minima. Go-around (manual).
 - (d) Go-around (autopilot).
 - (e) Go-around (visual ref. inadequate).
 - (f) Full auto approach and landing.
- (12) Landings
- (a) Normal landing.
 - (b) Crosswind landing.
 - (c) Landing with minimum flaps/slats.

- (d) Landing with critical engine inoperative (Simulated or in a full flight simulator)
- (13) Action after flight
 - (a) Shut down procedures.
 - (b) Securing procedures.
 - (c) Post flight inspection.
 - (d) Safety considerations.
- (14) General
 - (a) Decision making ability.
 - (b) Overall safety considerations.
 - (c) General smoothness and coordination.
 - (d) Ability to plan ahead.
 - (e) Overall impression.

Note:

1. Exercises (2)(f) and (g) must be conducted in a full flight simulator.

In the case of aeroplanes for which no full flight simulator is available it is important to note that in aeroplanes with a limited performance the engine failure must not be initiated until at least 500 ft above the runway end. In aeroplanes with transport category performance (TS 21.02.3(4)) the engine failure may be simulated shortly after reaching V2. The rejected take-off exercise prior to VI must be initiated at a speed that will ensure that safety is not adversely affected. Exercise (2)(h) and (i) may be carried out in the aeroplane taking the abovementioned issues into account

2. Either exercise 8 or 9 is to be flown with one engine inoperative.

3. Exercise 12 must be performed in a full flight simulator with an approved visual system.

1.2 The procedures and maneuvers must include -

- (1) the piloting of an aeroplane or simulator approved for the purpose, satisfactorily in all manoeuvres used in normal flight;
- (2) the execution of emergency manoeuvres which may include simulated forced landings and recovery from stalls entered from both level and steeply banked attitudes;
- (3) the operation of multi-engine aeroplanes at maximum permissible landing mass with one engine inoperative;

- (4) the execution of all normal manoeuvres, solely by means of instruments, including stalls, spirals and level turns of not less than 180 degrees in a banked attitude of not less than 45 degrees, followed by a turn in the reversed direction;
- (5) the operation of multi-engine aeroplanes solely by reference to instruments at maximum permissible landing mass with one engine inoperative;
- (6) while operating the aeroplane under actual or simulated instrument flight conditions, the carrying out of orientation and approach procedures by using radio aids, and to give any other demonstration of skill required for the instrument rating;
- (7) the execution of all other manoeuvres which may be essential to establish his competency;
- (8) the carrying out of the tests detailed in subparagraphs (2), (3) and (5) in an aeroplane or simulator approved for the purpose, in the class for which, a rating is sought and where the rating is sought for an aeroplane having a maximum certificated mass exceeding 5 700 kg, in the type of aeroplane for which the rating is sought; and meeting the requirements for the issuing of an instrument rating: Provided that any manoeuvres required during the course of the tests, detailed in subparagraphs (1) to (8), may be modified or excluded by the examiner if such manoeuvres are inadvisable for the type of aeroplane used in the tests.

2. Conducting the skill test

- (1) The skill test must be conducted by a designated examiner.
- (2) The skill test must be preceded by an oral examination on, but not limited to -
 - (a) normal, abnormal and emergency procedures;
 - (b) limitations;
 - (c) systems knowledge; and
 - (d) the applicable Air Law, where appropriate.

3. Skill test report (1) Completion

- (1) The designated examiner conducting the skill test must complete the skill test report contained in form MZ 61-31, which is available from the Director General.

4. Assessment

- (1) All the procedures and manoeuvres must be assessed as indicated on the test form.

61.08.6 APPLICATION FOR AIRLINE TRANSPORT PILOT LICENSE (A)

1. Form of application

The application form for the issuing of an airline transport pilot license (aeroplane) is form MZ 61-03, which is available from the Director General.

2. Skill test report

The skill test report that must accompany an application for the issuing of an airline transport pilot license (aeroplane) is form number MZ 61-31 which is available from the Director General.

61.08.7 ISSUING OF AIRLINE TRANSPORT PILOT LICENSE (A)

1. Form of license

An airline transport pilot license (aeroplane) is issued on the form determined by the Director General.

61.08.11 MAINTENANCE OF COMPETENCY (ATP-A)

1. Type or similar type of aeroplane

- (1) The aeroplane type (name) shall mean the ICAO designator allocated to that specific type of aeroplane as contained in Doc 8643. For instance, a Boeing 737 aeroplane will be reflected as a B73.
- (2) In absence of an ICAO designator, for instance in the case of self built aeroplanes, the Director General will allocate an official IACM designator.
- (3) When a group type of 5700 kg is reflected on a pilot's license it does not mean that he may readily fly any aeroplane within that group. The pilot would only be allowed to fly those aeroplanes (and systems) within the group that have been endorsed by his instructor in his/her logbook after the appropriate training has been received.
- (4) For maintenance of competency, the pilot may thus conduct the required take-offs and landings in the specific type of aeroplane which has been endorsed in his logbook that he intends to carry passengers on.
- (5) A similar type is considered to be any variant of the type of aeroplane to be used which is included under the same ICAO designator and which has the same systems as the aeroplane in which the flight is to be undertaken.
- (6) The relevant systems applicable are listed below:-
 - (a) Nose wheel-type undercarriage,
 - (b) tail wheel-type undercarriage,
 - (c) retractable undercarriage,
 - (d) carburettor engines,
 - (e) normal-aspirated engines,
 - (f) fuel-injected engines,
 - (g) turbo-and supercharged engines,
 - (h) geared engines,
 - (i) fixed-pitch propellers,
 - (j) variable-pitch and constant speed propellers,
 - (k) pressurisation.

61.09.3 TRAINING (ATP-H)

1. Aim of training course

The aim of the airline transport pilot license (helicopter) training course is to train the holder of a commercial pilot license (helicopter) to the level necessary for the issuing of an airline transport pilot license (helicopter).

2. Duration, contents and requirements of training course

- (1) The applicant must be the holder of a commercial pilot license (helicopter). The course must be completed within 18 months.
- (2) The aviation training organisation must ensure that prior to being admitted to the course, the applicant has a sufficient level of knowledge of mathematics and physics to facilitate an understanding of the content of the course.
- (3) The course comprises -
 - (a) a theoretical knowledge course to airline transport pilot license (helicopter) knowledge level;
 - (b) visual and instrument flying training; and
 - (c) training in multi-crew cooperation in operation of multi-pilot helicopters

3. Theoretical knowledge course

The theoretical knowledge course must comprise at least 550 hours of instruction, of which 250 hours may be monitored self-study by means of assignments, including formal classroom work, computer-based training, slide/tape presentation, interactive video and learning carrels, where appropriate.

The 550 hours of instruction should preferably be divided as follows:

Subject	Hours instruction	Hours monitored self-study
Air Law and ATC procedures	60	30
Helicopter general knowledge	80	40
Flight performance and planning	100	50
Human performance and limitations	50	20
Meteorology	60	30
Navigation	140	50
Operational procedures	20	10
Principles of flight	20	10
Communications	20	10

4. Theoretical knowledge course syllabus

The theoretical knowledge course syllabus for Airline Transport Aeroplane Pilots is in the Generic Theoretical Knowledge Course Syllabus contained in Technical Standard 61.01.30.

61.09.4 THEORETICAL KNOWLEDGE EXAMINATION (ATP-H)

1. Contents

An applicant for an airline transport pilot license (helicopter) must pass a written theoretical knowledge examination on -

- (1) the regulations concerning -
 - (a) conditions relating to flying in Mozambique;
 - (b) licensing requirements applicable to private pilots;
 - (c) logbooks and crediting of flight time;
 - (d) rules of the air, flight rules and visual flight rules;
 - (e) instrument flight rules;
 - (f) ground and light signals for aerodrome traffic;
 - (g) air traffic services;
 - (h) search and rescue;
 - (i) taxi rules;
 - (j) investigation of aircraft accidents;
 - (k) requirements applicable to aircraft flying to or from or over Mozambique on other than scheduled international commercial air transport operations;
 - (l) prohibited and restricted areas;
 - (m) knowledge of the following as set out in the AIP, AIP SUP, NOTAM and AIC currently in force:
 - (i) aeronautical information services available to pilots;
 - (ii) units of measurement;
 - (iii) meteorological information available to pilots;
 - (iv) names and functions of the various air traffic services units and designations of associated airspaces;
 - (v) altimeter setting procedures; and
 - (vi) prohibited, restricted and danger areas;
 - (vii) the organisation and operation of the various air traffic services units;
 - (viii) holding, approach and departure procedures;
 - (ix) entry and departure requirements;
 - (x) search and rescue; and
 - (xi) incident reporting procedures;

- (n) flight-time limitations;
- (o) when licensed heliports must be used;
- (p) training of flight crew members;
- (2) flight operation;
- (3) aeronautical charts and the form of the earth;
- (4) flight navigation;
- (5) radio aids to navigation;
- (6) aeronautical instruments;
- (7) meteorology; and
- (8) the technical subject prescribed in paragraph 2 (General).

2. General

- (1) Principles of theory of flight and definition of all relevant terms.
- (2) Properties of air, density, pressure, relationship between pressure, density and temperature, and their effect on helicopter and engine performance, isothermal atmosphere and international standard atmosphere.
- (3) The action to be taken in the event of a serious defect or an accident.
- (4) The principles of operation of engines and their component parts and accessories.
- (5) Definition of the terms associated with rotors, gearboxes and power transmission devices.
- (6) Direction of movement of controls and the influence of one control application on other controls.
- (7) Elementary knowledge of electricity and magnetism and the terms associated therewith.

3. Conducting of theoretical knowledge examination

The written theoretical knowledge examination is conducted by the Director General.

4. Duties of Director General

- (1) The Director General must publish in an AIC -
 - (a) the dates on which examinations are to be written;
 - (b) the latest date by which applications for each such examination are to reach the Director General;

- (c) the format and duration of each examination; and
 - (d) the fees payable for such examinations.
- (2) The entry fee paid for any examination may, upon request by the candidate, be refunded or transferred to a subsequent examination: Provided that an acceptable reason for such request is furnished.

5. Admission to examinations

Admission to a written theoretical examination is subject to the following conditions:

- (1) An application for admission to the examination must be made on the relevant application form;
- (2) the application must be accompanied by the fee prescribed in Part 187 of the MOZ-CAR;
- (3) the application and fee must be submitted to the Director General, to reach the Director General's office on or before the closing date published for such examination;
- (4) the rules and instructions determined by the Director General for such examination, must be complied with, which rules and instructions must be supplied to a candidate upon his or her admission for a particular examination; and
- (5) a candidate must subject himself or herself to disqualification from future examinations for a period not exceeding 12 months if the rules and instructions referred to in subparagraph (4) are contravened and the candidate will be deemed to have failed the examination in which such contravention occurred.

6. Remarking of examination scripts

- (1) A candidate who has failed one or more examination papers with a mark between 66% and 69%, may on payment of the fee prescribed in Part 187 of the MOZ-CAR, apply for the remarking of the script or scripts concerned.
- (2) Application for the remarking of an examination script or scripts must be made in writing to the Director General, and such application, accompanied by the fee, must reach the Director General not later than one month after the examination results were published.
- (3) The decision of the Director General on any remarked examination script is final.

61.09.5 SKILL TEST (ATP-H)

1. Procedures and manoeuvres

An applicant for an airline transport pilot license (helicopter) must demonstrate the following procedures and manoeuvres:

- (1) Pre-flight preparations and checks:
 - (a) Helicopter exterior visual inspection; location of each item and purpose of inspection;
 - (b) cockpit inspection;
 - (c) starting procedures, radio and navigation equipment check, selection and setting of navigation and communication frequencies;
 - (d) taxiing/air taxiing in compliance with air traffic control instructions or on instructions of an instructor;
 - (e) pre-take-off procedures and checks;
- (2) take-offs:
 - (a) Take-offs (various profiles);
 - (b) cross wind take-off (if practicable);
 - (c) take-off at maximum take-off mass (actual or simulated maximum take-off mass);
 - (d) take-offs with simulated engine failure:
 - (i) Shortly before reaching TDP;
 - (ii) shortly after reaching TDP;
- (3) flight manoeuvres and procedures:
 - (a) Turns;
 - (b) landings, various profiles:
 - (i) Landing following simulated engine failure before LDP;
 - (ii) landing following simulated engine failure after LDP;
 - (c) normal and abnormal operations of the following systems and procedures:
 - (i) Engine;
 - (ii) air conditioning (heating, ventilation);
 - (iii) pitot/static system;
 - (iv) fuel system;

- (v) electrical system;
 - (vi) hydraulic system;
 - (vii) flight control and trim-system;
 - (viii) anti- and de-icing system;
 - (ix) autopilot/Flight Director;
 - (x) stability augmentation devices;
 - (xi) weather radar, radio altimeter, transponder;
 - (xii) area navigation system;
 - (xiii) landing gear system;
 - (xiv) tail rotor control failure (if applicable);
 - (xv) tail rotor loss (if applicable);
 - (xvi) auxiliary power unit;
 - (xvii) radio, navigation equipment, instruments flight management system;
- (d) abnormal and emergency procedures:
 - (i) Fire drills (including evacuation if applicable);
 - (ii) smoke control and removal;
 - (iii) engine failures, shut down and restart at a safe height;
 - (iv) fuel dumping (simulated);
 - (v) autorotation descent;
 - (vi) autorotative landing or power recovery;
 - (vii) incapacitation of crew member;
 - (viii) other emergency procedures as outlined in the appropriate Flight Manual;
- (e) turns with 30 degrees bank, 180 degrees to 360 degrees left and right, by sole reference to instruments;
- (4) instrument flight procedures (to be performed in IMC or simulated IMC):
 - (a) Instrument take-off: transition to instrument flight is required as soon as possible after becoming airborne;
 - (b) adherence to departure and arrival routes and ATC instructions;
 - (c) holding procedures;
 - (d) ILS-approaches down to CAT I decision height;
 - (i) manually, without Flight Director;
 - (ii) manually, with Flight Director;

- (iii) with coupled autopilot;
 - (iv) manually, with one engine simulated inoperative. (Engine failure has to be simulated during final approach before passing the outer marker (OM) until touchdown, or through the complete missed approach procedure);
- (e) NDB or VOR/LOC-approach down to the minimum descent altitude;
- (f) circling approach under following conditions:
 - (i) Approach to the authorized minimum circling altitude at the aerodrome in question in accordance with the local instrument approach facilities in simulated instrument flight conditions, followed by -
 - (ii) circling approach to another runway at least 90 degrees off centreline from final approach used in item (i) at the authorized minimum circling approach altitude. Remark: If (i) and (ii) are not possible due to ATC reasons, a simulated low visibility circuit (visibility less than 800m) may be performed;
- (g) missed approach procedures:
 - (i) Go-around with all engines operating after an ILS approach on reaching decision height;
 - (ii) other missed approach procedures;
 - (iii) go-around with one engine simulated inoperative, after an ILS approach, on reaching decision height;
 - (iv) type rating for instrument approaches down to a decision height of less than 60m (200 ft) (CAT II/III):
- (h) Following manoeuvres and procedures are to be trained for the purpose of type rating extension to instrument approach down to a DH of less than 60m (200 ft).
- (5) During the following instrument approaches and missed approach procedures all equipment necessary for type certification of instrument approaches down to a decision height of less than 60m (200 ft) has to be used:
 - (a) Aborted take-off; at take-off weather minima;
 - (b) ILS approach down to a decision height applied for using flight guidance system standard procedures of crew co-ordination (task sharing, calling procedures, mutual surveillance, information and support are to be observed particularly);
 - (c) go-around:
After approaches as indicated in (b) on reaching decision height. The transition training also has to comprise go-around due to (simulated) insufficient runway visual range, wind shear, aircraft deviation more than tolerable for a successful approach, and ground/airborne

equipment failure prior to reaching decision height, furthermore, go-around with airborne equipment failure. Special attention has to be given to go-around procedures with pre-calculated manual or automatic go-around altitude guidance;

- (d) landings:
With visual reference established at decision height following an instrument approach. Depending on the specific flight guidance system, an automatic landing has to be performed;

- (6) use of optional equipment.

2. Conducting the skill test

- (1) The skill test must be conducted by a designated examiner.
- (2) The skill test must be preceded by an oral examination on, but not limited to -
 - (a) normal, abnormal and emergency procedures;
 - (b) limitations;
 - (c) systems knowledge; and
 - (d) the applicable Air Law, where appropriate.

3. Skill test report

- (1) Completion

The designated examiner conducting the skill test must complete the skill test report contained in form MZ 61-32.

- (2) Assessment

All the procedures and manoeuvres must be assessed as indicated on the test form.

61.09.6 APPLICATION FOR AIRLINE TRANSPORT PILOT LICENSE (H)

1. Form of application

The application form for the issuing of an airline transport pilot license (helicopter) is form MZ 61-03, which is available from the Director General.

2. Skill test report

The skill test report that must accompany an application for the issuing of an airline transport pilot license (helicopter) is form number MZ 61-32 which is available from the Director General.

61.09.7 ISSUING OF AIRLINE TRANSPORT PILOT LICENSE (H)

1. Form of license

An airline transport pilot license (helicopter) is issued on the form determined by the Director General.

61.09.11 MAINTENANCE OF COMPETENCY (ATP-H)

1. Type or similar type of helicopter

- (1) The helicopter type (name) shall mean the ICAO designator allocated to that specific type of helicopter as contained in Doc 8643. For instance, a Robinson 22 helicopter will be reflected as a R22.
- (2) In absence of an ICAO designator, for instance in the case of self built helicopter, the Director General will allocate an official IACM designator.
- (3) A helicopter type is reflected on a pilot's license and endorsed in the pilot's logbook by the instructor after the appropriate training has been received.
- (4) For maintenance of competency, the pilot may thus conduct the required circuits and landings in the specific type of helicopter which is reflected on his license that he intends to carry passengers on.
- (5) A similar type is considered to be any variant of the type of helicopter to be used which is included under the same ICAO designator and which has the same systems as the helicopter on which the flight is to be undertaken.
- (6) In cases where there are differences between helicopters under a specific name, it is the responsibility of the pilot to be acquainted with such differences. Where such differences are of a major nature, such as a substantial difference in for instance the power-plant, the pilot is to acquaint himself thoroughly with such difference and fly with an instructor and on completion have his logbook certified by the instructor.

61.10.3 TRAINING (MPL)

1. Aim of training course

The aim of the training course is to train a candidate to the level of proficiency required for the issuing of a microlight aeroplane pilot license.

The course comprises a -

- (1) theoretical knowledge course to microlight aeroplane pilot license level; and
- (2) practical training course.

2. Theoretical knowledge course

The theoretical knowledge course must comprise at least 80 hours of instruction, of which 20 hours may be monitored self-study by means of assignments. This instruction must include classroom work, interactive video, slide tape presentation, computer-based training and learning carrels, where applicable.

The 80 hours of instruction should preferably be divided as follows:

Subject	Hours
Air law and ATC procedures	5
Aircraft general knowledge	10
Flight performance and planning	20
Navigation	10
Meteorology	5
Operational procedures	10
Principles of flight	5
Human performance and limitations	5
Communications	10

3. Theoretical knowledge course syllabus

The theoretical knowledge course syllabus for Microlight Aeroplane Pilots is the relevant elements contained in the Private Pilot Generic Theoretical Knowledge Course Syllabus contained in Technical Standard 61.01.30.

4. Practical training course

- (1) Exercise 1: Familiarisation with microlight aeroplane Cockpit drill, controls, gauges, fire appliances, etc.
- (2) Exercise 2: Preparation for flight
 - (a) External check, chocks, operation of safety harness or belt, precautions before starting.

- (b) Starting.
 - (c) Control check.
 - (d) Engine run-up or test.
- (3) Exercise 3: Air experience
- The aim of this sequence is to instil confidence in a pupil who has previously flown very little or not at all, as well as to impart knowledge.
- (4) Exercise 4: Effect of controls
- (a) Momentary application of each control.
 - (b) Slipstream effect on controls.
 - (c) Further effect on controls - application and retention in applied position for an appreciable period of rudder and aileron.
- (5) Exercise 5: Taxiing
- (6) Exercise 6: Straight and level flight
- (7) Exercise 7: Climbing
- (a) With flaps up.
 - (b) With flaps down.
- (8) Exercise 8: Descending
- (a) Flaps up.
 - (b) Flaps and undercarriage down.
 - (c) Engine-assisted.
- (9) Exercise 9: Stalling (only to be done in microlights capable of doing this)
- (a) From straight glide.
 - (b) With engine delivering cruising power.
 - (c) With engine delivering reduced power (as in the engine-assisted approach).
 - (d) After engine failure while climbing steeply at full throttle.
 - (e) With flaps and undercarriage down.
- (10) Exercise 10: Medium turns
- (11) Exercise 11:
- (a) Descending turns

- (b) Climbing turns
- (12) Exercise 12: Take-off-including vital action drill and engine failure on take-off.
- (13) Exercise 13: Approach and landing - including going round again.
- (14) Exercise 14: Spinning (only to be done in microlights capable of doing this)
 - (a) Full spin.
 - (b) Incipient spin.
- (15) Exercise 15: First solo

Before flying solo a pupil must in addition to being proficient in exercises 1 to 14, be able to make a reasonable effort at the exercise of "Elementary forced landing", i.e. the ability to execute and approach on a large open space without the use of a side slip, and have had exercise 23 demonstrated to him or her. He or she must also have completed a minimum of six hours of dual flight instruction.
- (16) Exercise 16: Side-slipping
 - (a) Effect of controls in a sideslip.
 - (b) The slip into wind.
 - (c) The slip across wind.
 - (d) The slip in a turn.
- (17) Exercise 17: Steep turns
 - (a) With engine.
 - (b) Without engine.
- (18) Exercise 19: Low flying - Emphasis on regulations governing low flying.
 - (a) Effect of drift.
 - (b) Effect of wind on ground speed.
 - (c) Effect of wind in inducing apparent skids and slips in turns.
- (19) Exercise 20: Cross-wind take-off and landing
- (20) Exercise 21: Precautionary landing
 - (a) Inspection of selected landing area.
 - (b) Approach and landing.
- (21) Exercise 22: Forced landing

- (22) Exercise 23: Action in event of fire (applicable to type)
- (23) Exercise 26: Navigation
 - (a) one triangular cross-country flight, whether dual or under supervision, and one solo triangular cross-country flight, each of a duration of not less than 90 minutes flown at normal cruising speed; and
 - (b) one triangular cross-country flight, whether dual or under supervision, of duration of not less than 90 minutes flown at normal cruising speed and which includes a full stop landing at a point other than the point of departure.

61.10.4 THEORETICAL KNOWLEDGE EXAMINATION (MPL)

1. Contents

- (1) An applicant for a microlight aeroplane pilot license must pass a written theoretical knowledge examination on-
 - (a) conditions relating to flying in Mozambique;
 - (b) licensing requirements applicable to microlight aeroplane pilots;
 - (c) rules of the air;
 - (d) visual flight rules;
 - (e) taxi rules;
 - (f) prohibited and restricted areas;
- (2) The following as set out in the AIP, AIP SUP and in NOTAM and AIC currently in force:
 - (a) Meteorological information available to pilots;
 - (b) altimeter setting procedures;
 - (c) prohibited, restricted and danger areas;
- (3) the elementary principles of aeronautical charts:
 - (a) Meteorological information for cross-country flights;
 - (b) the compass; and
 - (c) the technical subjects prescribed in paragraph 2.

2. General

- (1) Elementary principles of theory of flight, definition of terms, e.g. airflow, forces on a microlight aeroplane, straight and level flight, relation between speed and angle of attack, angle of incidence, lift/drag ratio, stability, centre of pressure, flaps and slots.
- (2) Properties of air, density, pressure, relationship between pressure, density and temperature, and their effect on microlight aeroplanes and engine performance, isothermal atmosphere, international standard atmosphere.
- (3) The action to be taken in the event of a serious defect or a heavy landing.
- (4) The principles of operation of engines and their component parts and accessories.
- (5) Direction of movement of controls, principles of operation and function of trimming, servo or balance tabs and alternative devices.

- (6) Elementary knowledge of electricity and magnetism - definition of terms, e.g. volts, amperes, ohms, watts, alternating and direct current, aircraft batteries - charging and functioning.
- (7) Definition of the terms associated with propellers, function of constant speed, fully feathering and braking propellers.

3. Conducting of theoretical knowledge examination

- (1) The written theoretical knowledge examination must be conducted by a Category C, Grade II microlight aeroplane flight instructor.
- (2) The flight instructor referred to in subparagraph (1), may not be the instructor from whom the applicant received his or her theoretical training.

4. Duties of Aviation Training Organisation

- (1) The aviation training organisation may publish -
 - (a) the dates on which examinations are to be written;
 - (b) the latest date by which applications for each such examination are to reach the aviation training organisation;
 - (c) the format and duration of each examination; and
 - (d) the fees payable for such examinations.
- (2) The entry fee paid for any examination may, upon request by the candidate, be refunded or transferred to a subsequent examination: Provided that an acceptable reason for such request is furnished.

5. Admission to examinations

Admission to a written theoretical examination is subject to the following conditions:

- (1) An application for admission to the examination must be made on the relevant application form;
- (2) the application must be accompanied by the entry fee;
- (3) the application and fee must be submitted to the relevant aviation training organisation, to reach its office on or before the closing date published for such examination;
- (4) the rules and instructions determined by the aviation training organisation for such examination, must be complied with, which rules and instructions must be supplied to a candidate upon his or her admission for a particular examination; and
- (5) a candidate must subject himself or herself to disqualification from future examinations for a period not exceeding 12 months if the rules and instructions referred to in subparagraph (4) are contravened and the candidate will be deemed to have failed the examination in which such contravention occurred.

6. Remarking of examination scripts

- (1) A candidate who has failed one or more examination papers with a mark between 66% and 69%, may on payment of the fee determined by the aviation training organisation, apply for the remarking of the script or scripts concerned.
- (2) Application for the remarking of an examination script or scripts must be made in writing to the aviation training organisation, and such application, accompanied by the fee, must reach the aviation training organisation not later than one month after the examination results were published.
- (3) The decision of the aviation training organisation on any remarked examination script is final.

61.10.5 SKILL TEST (MPL)

1. Procedures and manoeuvres

1.1 An applicant for a microlight aeroplane pilot license must demonstrate the following procedures and manoeuvres:

- (1) Pre-flight procedures
 - (a) Aircraft knowledge.
 - (b) Mass and balance.
 - (c) Performance calculations.
 - (d) Pre-flight inspection.
 - (e) Engine starting.
 - (f) Pre-taxi checks.
 - (g) Taxi.
 - (h) Pre-take off procedures.
 - (i) Radio procedures.
 - (j) Safety considerations.
- (2) Take-off
 - (a) Pre-take off briefing.
 - (b) Short/soft field take-off.
 - (c) Normal take-off.
 - (d) Crosswind take-off.
 - (e) Engine failure during/after take-off.
 - (f) Safety considerations.
- (3) Departure
 - (a) Departure procedures.
 - (b) Accuracy of flight.
 - (c) ATC liaison.
 - (d) Climbing.
 - (e) Climbing turns.
 - (f) Levelling off.
 - (g) Safety considerations.
- (4) General flying

- (a) Straight and level.
 - (b) Steep turns (45° bank).
 - (c) Flight at minimum speed.
 - (d) Stall (clean) recovery with power.
 - (e) Stall (clean) recovery without power.
 - (f) Stall in approach configuration (with power).
 - (h) Forced landing without power.
 - (i) Precautionary landing.
 - (j) Radio procedures.
 - (k) Safety considerations.
- (5) Arrival and landing procedures
 - (a) Arrival procedures.
 - (b) Glide approach.
 - (c) Short field landing.
 - (d) Crosswind landing.
 - (e) Go-around from low height.
 - (f) ATC procedures.
 - (g) Safety considerations.
- (6) Navigation
 - (a) Navigation log/plan.
 - (b) Maintenance of altitude and heading.
 - (c) Map reading.
 - (d) Revision of ETA.
 - (e) Log keeping.
 - (f) Use of radio navigation aids.
 - (g) Basic IF.
 - (h) Fuel/engine management.
 - (i) Systems and carburettor icing checks.
 - (j) ATC procedures and altimeter setting.
 - (k) Safety considerations.
- (7) Action after flight
 - (a) Shut down procedures.
 - (b) Securing procedures.
 - (c) Post flight inspection.

(d) Safety considerations.

(8) Abnormal and emergency procedures

Note: The applicant is expected to indicate the actions to be taken and carry out touch drills, but is not expected to perform any operating action. This manoeuvre may be combined with other manoeuvres.

(a) Engine fire during start and in the air.

(b) Electrical failure.

(c) Brake failure.

(d) Trim system problems.

(e) Radio failure.

(f) Other (state).

(9) General

(a) Decision making ability.

(b) Overall safety considerations.

(c) General smoothness and coordination.

(d) Ability to plan ahead.

(e) Overall impression.

1.2 The procedures and manoeuvres must include -

(1) take-off, circuit and landing;

(2) stall and incipient spin recoveries;

(3) steep turns left and right at constant height; and

(4) simulated forced landing from a minimum height appropriate to the said type of microlight aeroplane to execute a landing not more than 150 m beyond a point selected by the designated examiner.

2. Conducting the skill test

(1) The skill test must be conducted by a designated examiner.

(2) The skill test must be preceded by an oral examination on, but not limited to –

(a) normal, abnormal and emergency procedures;

(b) limitations;

(c) systems knowledge; and

(d) the applicable Air Law, where appropriate.

3. Skill test report

(1) Completion

The designated examiner conducting the skill test must complete the skill test report contained in form MZ 61-30A, which is available from the Director General.

(2) Assessment

All the procedures and manoeuvres must be assessed as prescribed on the test form.

61.10.6 APPLICATION FOR MICROLIGHT PILOT LICENSE

1. Form of application

The application form for the issuing of a microlight pilot license is form MZ 61-02a, which is available from the Director General.

2. Skill test report

The skill test report that must accompany an application for the issuing of a microlight pilot license is form number MZ 61-30A which is available from the Director General.

61.10.7 ISSUING OF MICROLIGHT PILOT LICENSE

1. Form of license

A microlight pilot license is issued on the form determined by the Director General.

61.11.3 TRAINING (CMPL)

1. Aim of training course

The aim of the training course is to train a candidate to the level of proficiency required for the issuing of a commercial microlight aeroplane pilot license.

The course comprises a -

- (1) theoretical knowledge course to commercial microlight aeroplane pilot license level; and
- (2) practical training course.

2. Duration, contents and requirements of training course

The applicant must be the holder of a microlight pilot license (aeroplane). The course must be completed within 18 months.

The course comprises -

- (1) a theoretical knowledge course to commercial microlight pilot license (aeroplane) knowledge level; and
- (2) visual and instrument flying training.

3. Theoretical knowledge course

The theoretical knowledge course comprises at least 250 hours of instruction, of which 100 hours may be monitored self-study by means of assignments, including formal classroom work, computer-based training, slide/tape presentation, interactive video and learning carrels, where appropriate.

The 250 hours of instruction should preferably be divided as follows:

Subject	Hours instruction	Hours monitored self-study
Air Law and ATC procedures	30	10
Aircraft general knowledge	40	10
Flight performance and planning	45	20
Human performance and limitations	10	5
Meteorology	40	20
Navigation	70	35
Operational procedures	10	5
Principles of flight	15	10
Communications	10	5

4. Theoretical knowledge course syllabus

The theoretical knowledge course syllabus for Commercial Microlight Aeroplane Pilots is the relevant elements contained in the Commercial Pilot Generic Theoretical Knowledge Course Syllabus contained in Technical Standard 61.01.30.

5. Practical training course

The practical training course should include the following exercises:

- (1) Pre-flight operations, mass and balance determination, aeroplane inspection and servicing;
- (2) take-off, traffic pattern, approach and landing. Use of checklists, collision avoidance and checking procedures;
- (3) traffic patterns, simulated engine failure during and after take-off;
- (4) maximum performance take-offs and short field landings;
- (5) crosswind take-offs and landings and go-arounds;
- (6) flight at relatively critical high airspeeds, recognition and recovery from spiral dives;
- (7) flight at critically slow airspeeds, spin avoidance (when applicable), recognition of and recovery from stalls (when applicable);
- (8) incipient and full spins applicable to type (when applicable); and
- (9) cross country flying using DR and radio navigation aids.

Flight planning by the applicant, filing of flight plans, evaluation of weather briefing documentation, NOTAM, RT 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 communications failure, weather deterioration, diversion procedures, simulated engine failure during cruise flight and selection of an emergency strip.

61.11.4 THEORETICAL KNOWLEDGE EXAMINATION (CMPL)

1. Contents

An applicant for a commercial microlight aeroplane pilot license must pass a written theoretical knowledge examination in -

- (1) the regulations concerning -
 - (a) conditions relating to flying in Mozambique;
 - (b) licensing requirements applicable to commercial microlight aeroplane pilots;
 - (c) rules of the air;
 - (d) visual flight rules;
 - (e) taxi rules;
 - (f) prohibited and restricted areas;
- (2) the following as set out in the AIP, AIP SUP and in NOTAM and AIC currently in force:
 - (a) Meteorological information available to pilots;
 - (b) altimeter setting procedures;
 - (c) prohibited, restricted and danger areas;
- (3) the elementary principles of aeronautical charts:
 - (a) Meteorological information for cross-country flights;
 - (b) the compass; and
- (4) the technical subjects prescribed in paragraph 2 (General).

2. General

- (1) Elementary principles of theory of flight, definition of terms, e.g. airflow, forces on a microlight aeroplane, straight and level flight, relation between speed and angle of attack, angle of incidence, lift/drag ratio, stability, centre of pressure, flaps and slots.
- (2) Properties of air, density, pressure, relationship between pressure, density and temperature, and their effect on microlight aeroplanes and engine performance, isothermal atmosphere, international standard atmosphere.
- (3) The action to be taken in the event of a serious defect or a heavy landing.
- (4) The principles of operation of engines and their component parts and accessories.

- (5) Definition of the terms associated with propellers, function of constant speed, fully feathering and braking propellers.
- (6) Direction of movement of controls, principles of operation and function of trimming, servo or balance tabs and alternative devices.
- (7) Elementary knowledge of electricity and magnetism - definition of terms, e.g. volts, amperes, ohms, watts, alternating and direct current, aircraft batteries - charging and functioning.

3. Conducting of theoretical knowledge examination

The written theoretical knowledge examination is conducted by the Director General.

4. Duties of Director General

- (1) The Director General must publish in an AIC -
 - (a) the dates on which examinations are to be written;
 - (b) the latest date by which applications for each such examination are to reach the Director General;
 - (c) the format and duration of each examination; and
 - (d) the fees payable for such examinations.
- (2) The entry fee paid for any examination may, upon request by the candidate, be refunded or transferred to a subsequent examination: Provided that an acceptable reason for such request is furnished.

5. Admission to examinations

Admission to a written theoretical examination is subject to the following conditions:

- (1) An application for admission to the examination must be made on the relevant application form;
- (2) the application must be accompanied by the fee prescribed in Part 187 of the MOZ-CAR;
- (3) the application and fee must be submitted to the Director General, to reach the Director General's office on or before the closing date published for such examination;
- (4) the rules and instructions determined by the Director General for such examination, must be complied with, which rules and instructions must be supplied to a candidate upon his or her admission for a particular examination; and
- (5) a candidate must subject himself or herself to disqualification from future examinations for a period not exceeding 12 months if the rules and instructions referred to in subparagraph (4) are contravened and the

candidate will be deemed to have failed the examination in which such contravention occurred.

6. Remarking of examination scripts

- (1) A candidate who has failed one or more examination papers with a mark between 66% and 69%, may on payment of the fee prescribed in Part 187 of the MOZ-CAR, apply for the remarking of the script or scripts concerned.
- (2) Application for the remarking of an examination script or scripts must be made in writing to the Director General, and such application, accompanied by the fee, must reach the Director General not later than one month after the examination results were published.
- (3) The decision of the Director General on any remarked examination script is final.

61.11.5 SKILL TEST (CMPL)

1. Procedures and manoeuvres

1.1 An applicant for a commercial microlight aeroplane pilot license must demonstrate the following procedures and manoeuvres:

- (1) Pre-flight procedures
 - (a) Aircraft knowledge.
 - (b) Mass and balance.
 - (c) Performance calculations.
 - (d) Pre-flight inspection.
 - (e) Engine starting.
 - (f) Pre-taxi checks.
 - (g) Taxi.
 - (h) Pre-take off procedures.
 - (i) Radio procedures.
 - (j) Safety considerations.
- (2) Take-off
 - (a) Pre-take off briefing.
 - (b) Short/soft field take-off.
 - (c) Normal take-off.
 - (d) Crosswind take-off.
 - (e) Engine failure during/after take-off.
 - (f) Safety considerations.
- (3) Departure
 - (a) Departure procedures.
 - (b) Accuracy of flight.
 - (c) ATC liaison.
 - (d) Climbing.
 - (e) Climbing turns.
 - (f) Levelling off.
 - (g) Safety considerations.

- (4) General flying
 - (a) Straight and level.
 - (b) Steep turns (45° bank).
 - (c) Flight at minimum speed.
 - (d) Stall (clean) recovery with power.
 - (e) Stall (clean) recovery without power.
 - (f) Stall in approach configuration (with power).
 - (g) Spin/incipient spin (if applicable).
 - (h) Forced landing without power.
 - (i) Precautionary landing.
 - (j) Radio procedures.
 - (k) Safety considerations.
- (5) Arrival and landing procedures
 - (a) Arrival procedures.
 - (b) Glide approach.
 - (c) Short field landing.
 - (d) Crosswind landing.
 - (e) Go-around from low height.
 - (f) ATC procedures.
 - (g) Safety considerations.
- (6) Navigation
 - (a) Navigation log/plan.
 - (b) Maintenance of altitude and heading.
 - (c) Map reading.
 - (d) Revision of ETA.
 - (e) Log keeping.
 - (f) Use of radio navigation aids.
 - (g) Basic IF.
 - (i) Fuel/engine management.
 - (j) Systems and carburettor icing checks.
 - (k) ATC procedures and altimeter setting.
 - (l) Safety considerations.

(7) Action after flight

- (a) Shut down procedures.
- (b) Securing procedures.
- (c) Post flight inspection.
- (d) Safety considerations.

(8) Abnormal and emergency procedures

Note: The applicant is expected to indicate the actions to be taken and carry out touch drills, but is not expected to perform any operating action. This manoeuvre may be combined with other manoeuvres.

- (a) Engine fire during start and in the air.
- (b) Electrical failure.
- (c) Brake failure.
- (d) Trim system problems.
- (e) Radio failure.
- (f) Other (state).

(9) General

- (a) Decision making ability.
- (b) Overall safety considerations.
- (c) General smoothness and coordination.
- (d) Ability to plan ahead.
- (e) Overall impression.

1.2 The procedures and manoeuvres must include -

- (1) take-off, circuit and landing;
- (2) stall and incipient spin recoveries;
- (3) steep turns left and right at constant height; and
- (4) simulated forced landing from a minimum height appropriate to the said type of microlight aeroplane to execute a landing not more than 150 m beyond a point selected by the designated examiner.

2. Conducting the skill test

- (1) The skill test must be conducted by a designated examiner.
- (2) The skill test must be preceded by an oral examination on, but not limited to -

- (a) normal, abnormal and emergency procedures;
- (b) limitations;
- (c) systems knowledge; and
- (d) the applicable Air Law, where appropriate.

3. Skill test report

(1) Completion

The designated examiner conducting the skill test must complete the skill test report contained in form MZ 61-31A, which is available from the Director General.

(2) Assessment

All the procedures and manoeuvres must be assessed as prescribed on the test form.

61.11.6 APPLICATION FOR COMMERCIAL MICROLIGHT PILOT LICENSE

1. Form of application

The application form for the issuing of a commercial microlight pilot license is form MZ 61-03a, which is available from the Director General.

2. Skill test report

The skill test report that must accompany an application for the issuing of a commercial microlight pilot license is form number MZ 61-31A which is available from the Director General.

61.11.7 ISSUING OF COMMERCIAL MICROLIGHT PILOT LICENSE

1. Form of license

A commercial microlight pilot license is issued on the form determined by the Director General.

61.12.3 TRAINING (GLIDER) (RESERVED)

61.12.4 THEORETICAL KNOWLEDGE EXAMINATION (GLIDER) (RESERVED)

61.12.5 SKILL TEST (GLIDER) (RESERVED)

61.12.6 APPLICATION FOR GLIDER PILOT LICENSE (RESERVED)

61.12.7 ISSUING OF GLIDER PILOT LICENSE (RESERVED)

61.13.3 TRAINING (FREE BALLOON) (RESERVED)

61.13.4 THEORETICAL KNOWLEDGE EXAMINATION (FREE BALLOON) (RESERVED)

61.13.5 SKILL TEST (FREE BALLOON) (RESERVED)

61.13.6 APPLICATION FOR FREE BALLOON PILOT LICENSE (RESERVED)

61.13.7 ISSUING OF FREE BALLOON PILOT LICENSE (RESERVED)

61.14.3 TRAINING (COMMERCIAL FB) (RESERVED)

**61.14.4 THEORETICAL KNOWLEDGE EXAMINATION (COMMERCIAL FB)
(RESERVED)**

61.14.5 SKILL TEST (COMMERCIAL FB) (RESERVED)

**61.14.6 APPLICATION FOR COMMERCIAL FREE BALLOON PILOT LICENSE
(RESERVED)**

61.14.7 ISSUING OF COMMERCIAL FREE BALLOON PILOT LICENSE (RESERVED)

61.15.3 TRAINING (AIRSHIP) (RESERVED)

61.15.4 THEORETICAL KNOWLEDGE EXAMINATION (AIRSHIP) (RESERVED)

61.15.5 SKILL TEST (AIRSHIP) (RESERVED)

61.15.6 APPLICATION FOR AIRSHIP PILOT LICENSE (RESERVED)

61.15.7 ISSUING OF AIRSHIP PILOT LICENSE (RESERVED)

61.16.3 TRAINING (COMMERCIAL AIRSHIP) (RESERVED)

**61.16.4 THEORETICAL KNOWLEDGE EXAMINATION (COMMERCIAL AIRSHIP)
(RESERVED)**

61.16.5 SKILL TEST (COMMERCIAL AIRSHIP) (RESERVED)

61.16.6 APPLICATION FOR COMMERCIAL AIRSHIP PILOT LICENSE (RESERVED)

61.15.4 THEORETICAL KNOWLEDGE EXAMINATION (AIRSHIP) (RESERVED)

61.17.3 TRAINING (GYROPLANE) (RESERVED)

61.17.4 THEORETICAL KNOWLEDGE EXAMINATION (GYROPLANE) (RESERVED)

61.17.5 SKILL TEST (GYROPLANE) (RESERVED)

61.17.6 APPLICATION FOR GYROPLANE PILOT LICENSE (RESERVED)

61.17.7 ISSUING OF GYROPLANE PILOT LICENSE (RESERVED)

61.18.3 TRAINING (COMMERCIAL GYROPLANE) (RESERVED)

**61.18.4 THEORETICAL KNOWLEDGE EXAMINATION (COMMERCIAL GYRO)
(RESERVED)**

61.18.5 SKILL TEST (COMMERCIAL GYROPLANE) (RESERVED)

**61.18.6 APPLICATION FOR COMMERCIAL GYROPLANE PILOT LICENSE
(RESERVED)**

61.18.7 ISSUING OF COMMERCIAL GYROPLANE PILOT LICENSE (RESERVED)

61.19.2 TRAINING (TYPE RATING)

1. Crew resource management

1.1 Aim of training course

The aim of this course is to ensure that the applicant is proficient to operate as a crew member in multi-crew cooperation in multi-engine, multi-pilot aeroplanes under IFR.

1.2 General

This course is required by any applicant wishing to obtain a first type rating on multi-pilot aeroplanes. This course must be completed in a modular form over a period of not more than 6 months.

The course comprises -

- (1) a theoretical knowledge course; and
- (2) a practical training course.

The simulator element of this course must, as far as possible, be conducted in simulated commercial air transport operations.

The ground and flight instructors must be thoroughly familiar with the human factors aspects of aviation and must have completed a crew resource management (CRM) training programme. The instructor should also be current with the latest developments in human factors training and CRM techniques.

1.3 Multi-crew cooperation training

The objectives of this course are to optimise decision-making, communication, division of tasks, workload management, use of checklists, mutual supervision, teamwork and support throughout all phases of flight under normal, abnormal, and emergency conditions. This training concentrates on the development of non-technical skills applicable to working in a multi-crew environment.

The course will focus on teaching students the basics of functioning as a crew member in a multi-crew environment rather than as a collection of technically competent individuals. The course will also provide the crew members with opportunities to practice the skills necessary to be effective team leaders and members. The students shall operate as Pilot Flying (PF) and as Pilot Not Flying (PNF).

Students shall be made familiar with inter-personal interfaces and how to make best use of crew cooperation techniques and their personal leadership styles in a way that fosters crew effectiveness. Students will also be made

aware of the fact that their behaviour can have a powerful impact on crew functioning during high workload and stressful situations.

The most effective MCC training is carried out in several phases spread over a period of time. This is because behavioural changes cannot be accomplished in a short period of time. The trainees will require time, awareness, practice, feedback and continual re-reinforcement to learn meaningful lessons.

In summary the purpose of the CRM course is to achieve the following aims:

- (1) The tasks of the PF and PNF are clearly spelled out and divided in such a way that the PF is able to direct his or her full attention to flying the aeroplane knowing that the PNF is giving him or her the required support.
- (2) Mutual supervision, information and support are ensured at all times.

1.4 The Multi-Crew Cooperation Course

The course must cover theoretical knowledge training, practice and feedback in:

- (1) Interfaces
 - (a) Examples of software, hardware, environment and liveware mismatches in practice; and
 - (b) the "Shell" concept.
- (2) Leadership/followership and authority
 - (a) Managerial and supervisory skills;
 - (b) assertiveness;
 - (c) barriers;
 - (d) cultural influence;
 - (e) PF and PNF roles;
 - (f) professionalism; and
 - (g) team responsibility.
- (3) Personality, attitude and motivation
 - (a) Listening;
 - (b) conflict resolution;
 - (c) mediating;
 - (d) critique (pre-flight analyses and planning, ongoing review, post-flight); and
 - (e) team building.

- (4) The pilot-in-command fulfils his or her managing and decision-making functions irrespective of being PF or PNF.
- (5) Cooperation in the flight deck is effected in an orderly manner appropriate to normal, abnormal or emergency situations encountered.
- (6) Effective and clear communication during flight
 - (a) Listening;
 - (b) feedback;
 - (c) standard phraseologies;
 - (d) assertiveness; and
 - (e) participation.
- (7) Crew coordination procedures
 - (a) Flight techniques and cockpit procedures;
 - (b) standard phraseologies; and
 - (c) discipline.

The use of checklists is of particular 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 upon the complexity of the aircraft concerned, the situation presented, the flight crew composition, their operating experience and the operator's procedures as laid down in the flight operations manual.

1.5 Mutual supervision, information and support

- (1) 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.
- (2) Call out procedures are essential, especially during take-off and approach, to indicate progress of the flight, systems status etc.
- (3) Operation of aircraft systems, setting radios and navigation equipment etc. should not be performed without demand by the PF or without information to the PF and his or her confirmation.
- (4) The aviation training organisation must compile a series of lessons in simulated commercial air transport operations using a multi-pilot simulator.
- (5) Practice and feedback of CRM with regard to the liveware interface should also make provision for students to carry out self and peer critique in order to learn and use their newly acquired communication,

decision-making and leadership skills. This is best done in a simulator with video equipment. The video feedback is particularly powerful as it allows the students to see themselves as other people see them. Weak areas can be identified, accepted and worked on to encourage behavioural change.

- (6) This learning process must be an ongoing process if the students are to gain maximum benefit from this training. It is therefore essential that the basic training is done over a period of a few weeks to months and that regular refresher sessions are planned.

This course ends with a skill test in a multi-pilot aeroplane or simulator where the applicant demonstrates his or her ability to perform the duties of a pilot as PF and PNF.

1.6 Practical training course

The practical flying course must be in accordance with the manufacturer's requirements but must include at least the items contained in the table below. A minimum simulator or flight time of five hours is required.

Suggested exercises
Normal procedures Aircraft inspection Engine start procedures Taxi procedures Normal flight (one engine inoperative including stalls) Flight at critically slow speeds Normal landings
Engine Inoperative Procedures Engine failure recognition Demonstration of VMCA where possible Engine shutdown procedures Engine restart / Unfeathering procedures Determination of zero thrust settings Engine inoperative approaches and landings (zero thrust) Engine inoperative go-around or inability to go-around Engine failure during take-off
Night Flight Normal and engine inoperative circuits and landings
Instrument Flight (Holders of I/R) Upper airwork with sole reference to instruments Normal and engine inoperative approaches

2. Single-pilot multi-engine aeroplane type rating

2.1 Aim of training course

This course is designed to train pilots to the level of proficiency necessary to operate single-pilot multi-engine aeroplanes.

An applicant for the issuing of such a type rating must have completed not less than 70 hours as pilot-in-command of aeroplanes and must hold at least a private pilot license (aeroplane).

The course comprises -

- (1) a theoretical knowledge course; and
- (2) a visual and instrument flight training where applicable (i.e., for the holder of an I/R)

2.2 Theoretical knowledge course

The theoretical course for an initial multi-engine type rating consists of at least 10 hours of instruction in the form of lectures, classroom work, interactive video, slide / tape presentation, computer based training and learning carrels, where applicable.

The 10 hours of instruction should preferably be divided as follows:

Subject	Hours
Principles of flight applicable to ME aeroplanes	2.5
Aircraft technical	2.5
Flight performance and planning	2.5
Operational Procedures	2.5

61.19.3 THEORETICAL KNOWLEDGE EXAMINATION (TYPE RATING)

1. Examination

An applicant for the issuing of a type rating must pass a written examination applicable to the type of aircraft in respect of which application is made.

1.1 Theoretical examination on type of aeroplane to which application relates

Note: The examination in the following subjects will be confined to the type of aeroplane in respect of which application is made.

- (1) Operational limitations of the aeroplane, including its engines.
- (2) Definitions of the datum point, limits of centre of gravity position.
- (3) Aeroplane loading and centre of gravity computation prior to and for duration of flight.
- (4) Information contained in certificate of airworthiness and associated documents.
- (5) Aeroplane performance with regard to speed limitations.
- (6) The procedure to be followed in case of emergency, particularly in event of power plant failure and fire in the air.
- (7) Knowledge of the operations manual or flight manual, and maintenance inspection cycles.
- (8) Operation of flying controls, trimming, servo and balance tabs and alternative devices.
- (9) Normal and emergency systems for operating the landing gear and flaps, including a working knowledge of the systems.
- (10) The pneumatic pressure and vacuum system, location and functioning of the pumps and important units. Ground tests for correct functioning.
- (11) The pressurisation, heating and ventilating system, including a working knowledge of the principal components, the regulation of pressure, temperature and humidity.
- (12) The operation and functioning of the de-icing system, including the main units, duration of the supply.
- (13) The wheel brake system, pressures and defects liable to reduce the operating efficiency. Knowledge of the landing gear shock-absorbing system.
- (14) Knowledge of the fuel system, including the location and function of all important units incorporated in the system.

- (15) The location and capacity of the fuel tanks, including supplementary schemes, where applicable, the means of ascertaining fuel consumption en route.
- (16) Knowledge of the oil system, including capacity of the tanks, the location and function of all important units incorporated in the system.
- (17) The coolant system, where applicable, and the recommended range of temperature to be maintained under various circumstances.
- (18) A general knowledge of the electrical system, voltage and amperage in particular circuits, position and current-carrying capacity of fuses, circuit breakers and main units in the installation, importance of using and method of replacing correct fuses and resetting of circuit breakers.
- (19) The functioning of electrical engine starters and generators, location and checking of security and condition of batteries, action to be taken in the case of failure of any unit in the electrical system.
- (20) Flight planning based on loading and performance charts, fuel consumption and engine power curves. Control of power output and the computations involved.
- (21) The operation and elementary principles of the automatic pilot, including the method of engagement and disengagement, emergency release and power source, as applicable.
- (22) A working knowledge of the principles of operation of the engine instruments.
- (23) Characteristics of particular engines and their component parts and accessories and methods of control used therefore.
- (24) Types of fuel and oil used and refuelling procedures.
- (25) Operation and control of propellers fitted to the particular power plants.

1.2 Theoretical examination on type of helicopter to which application relates

Note: The examination in the following subjects will be confined to the type of helicopter in respect of which application is made.

- (1) Operational limitations of the helicopter, including its engines.
- (2) Definitions of the datum point, limits of centre of gravity position.
- (3) Helicopter loading and centre of gravity computation prior to and for duration of flight.
- (4) Information contained in certificate of airworthiness and associated documents.

- (5) Helicopter performance with regard to density and load limitations.
- (6) The procedure to be followed in case of emergency, particularly in event of power plant failure, tail rotor failure and fire in the air.
- (7) Knowledge of the operations manual or flight manual, and maintenance inspection cycles.
- (8) Operation of rotor engagement or disengagement systems, rotor controls, flying controls, trim systems and servo controls.
- (9) The pneumatic pressure and vacuum system, where applicable, location and functioning of the pumps and important units, ground tests for correct functioning.
- (10) The heating and ventilating system, including a working knowledge of the principal components.
- (11) The operation and functioning of the de-icing system, where applicable, including the main units.
- (12) Knowledge of the landing gear shock-absorbing system and, where applicable, the wheel brake system, system pressures and the defects liable to reduce operating efficiency.
- (13) Knowledge of the fuel system, including the location and function of all important units incorporated in the system.
- (14) The location and capacity of the fuel tanks, including supplementary schemes, where applicable, the means of ascertaining fuel consumption en route, fuel management techniques.
- (15) Knowledge of the oil system, including capacity of the tanks, the location and function of all important units incorporated in the system.
- (16) The cooling system, where applicable, and the recommended range of temperature to be maintained under various circumstances.
- (17) general knowledge of the electrical system, voltage and amperage in particular circuits, position and current-carrying capacity of fuses, circuit breakers and main units in the installation, importance of using and method of replacing correct fuses and resetting of circuit breakers.
- (18) The functioning of electrical engine starters and generators, location and checking of security and condition of batteries, action to be taken in the case of failure of any unit in the electrical system.
- (19) Flight planning based on loading and performance charts, fuel consumption and engine power curves. Control of power output and the computations involved.

- (20) The operation and elementary principles of the automatic pilot or stabilisation system, where applicable, including the method of engagement and disengagement, emergency release and power source, as applicable.
- (21) Normal and emergency systems for operating the landing gear, if applicable, including a working knowledge of the systems.
- (22) A working knowledge of the principles of operation of the engine instruments.
- (23) Characteristics of particular engines and their component parts and accessories and methods of control used therefore.
- (24) Types of fuel and oil used and refuelling procedures.
- (25) Operation and limitations of transmissions and associated components fitted to the particular helicopter.
- (26) General knowledge of the hydraulic systems, including capacity of the tanks, limitations, location and functioning of all important units.

1.3 Theoretical examination on type of microlight aeroplane to which application relates

Note: The examination in the following subjects will be confined to the type of microlight aeroplane in respect of which application is made.

- (1) Operational limitations of the microlight aeroplane, including its engines.
- (2) Definitions of the datum point, limits of centre of gravity position.
- (3) Microlight aeroplane loading and centre of gravity computation prior to and for duration of flight.
- (4) Information contained in certificate of airworthiness and associated documents.
- (5) Microlight aeroplane performance with regard to speed limitations.
- (6) The procedure to be followed in case of emergency, particularly in event of power plant failure and fire in the air.
- (7) Knowledge of the operations manual or flight manual, and maintenance inspection cycles.
- (8) Operation of flying controls, trimming, servo and balance tabs and alternative devices.
- (9) Normal and emergency systems for operating the landing gear and flaps, including a working knowledge of the systems.
- (10) The pneumatic pressure and vacuum system, location and functioning of the pumps and important units. Ground tests for correct functioning.

- (11) The pressurisation, heating and ventilating system, including a working knowledge of the principal components, the regulation of pressure, temperature and humidity.
- (12) The operation and functioning of the de-icing system, including the main units, duration of the supply.
- (13) The wheel brake system, pressures and defects liable to reduce the operating efficiency. Knowledge of the landing gear shock-absorbing system.
- (14) Knowledge of the fuel system, including the location and function of all important units incorporated in the system.
- (15) The location and capacity of the fuel tanks, including supplementary schemes, where applicable, the means of ascertaining fuel consumption en route.
- (16) Knowledge of the oil system, including capacity of the tanks, the location and function of all important units incorporated in the system.
- (17) The coolant system, where applicable, and the recommended range of temperature to be maintained under various circumstances.
- (18) A general knowledge of the electrical system, voltage and amperage in particular circuits, position and current-carrying capacity of fuses, circuit breakers and main units in the installation, importance of using and method of replacing correct fuses and resetting of circuit breakers.
- (19) The functioning of electrical engine starters and generators, location and checking of security and condition of batteries, action to be taken in the case of failure of any unit in the electrical system.
- (20) Flight planning based on loading and performance charts, fuel consumption and engine power curves. Control of power output and the computations involved.
- (21) The operation and elementary principles of the automatic pilot, including the method of engagement and disengagement, emergency release and power source, as applicable.
- (22) A working knowledge of the principles of operation of the engine instruments.
- (23) Characteristics of particular engines and their component parts and accessories and methods of control used therefore.
- (24) Types of fuel and oil used and refuelling procedures.
- (25) Operation and control of propellers fitted to the particular power plants.

2. Conducting of theoretical knowledge examinations

Theoretical knowledge examinations must be conducted by -

- (1) in the case of a type rating for an aircraft, excluding helicopters, with a maximum certificated mass of 5 700 kg or less -
 - (a) the holder of a valid Category A, Grade I or Grade II flight instructor rating; or
 - (b) the holder of a valid Category C, Grade I or Grade II flight instructor rating;
- (2) in the case of a type rating for an aircraft, excluding helicopters, with a maximum certificated mass exceeding 5 700 kg, the holder of a valid Category A, Grade I or Grade II aeroplane flight instructor rating;
- (3) in the case of a type rating for a helicopter, the holder of a valid Category B, Grade I or Grade II helicopter flight instructor rating.
- (4) The flight instructor referred to in subparagraph (1), (2) or (3), as the case may be, may not be the flight instructor from whom the applicant received his or her theoretical training.

3. Duties of Aviation Training Organisation

- (1) The aviation training organisation may publish -
 - (a) the dates on which examinations are to be written;
 - (b) the latest date by which applications for each such examination are to reach the aviation training organisation;
 - (c) the format and duration of each examination; and
 - (d) the fees payable for such examinations.
- (2) The entry fee paid for any examination may, upon request by the candidate, be refunded or transferred to a subsequent examination: Provided that an acceptable reason for such request is furnished.

4. Admission to examinations

Admission to a written theoretical examination is subject to the following conditions:

- (1) An application for admission to the examination must be made on the relevant application form;
- (2) the application must be accompanied by the entry fee;
- (3) the application and fee must be submitted to the aviation training organisation to reach its office on or before the closing date published for such examination;

- (4) the rules and instructions determined by the aviation training organisation for such examination, must be complied with, which rules and instructions must be supplied to a candidate upon his or her admission for a particular examination; and
- (5) a candidate must subject himself or herself to disqualification from future examinations for a period not exceeding 12 months if the rules and instructions referred to in subparagraph (4) are contravened and the candidate will be deemed to have failed the examination in which such contravention occurred.

5. Marking of examination scripts

- (1) A candidate who has failed one or more examination papers with a mark between 66% and 69%, may, on payment of the fee determined by the aviation training organisation, apply for the remarking of the script or scripts concerned.
- (2) Application for the remarking of an examination script or scripts must be made in writing to the aviation training organisation and such application, accompanied by the fee, must reach the aviation training organisation not later than one month after the examination results were published.
- (3) The decision of the aviation training organisation on any remarked examination script is final.

61.19.4 SKILL TEST (TYPE RATING)

1. Procedures and manoeuvres

An applicant for the issuing of a type rating must demonstrate the following procedures and manoeuvres appropriate to the pilot license held by him or her:

1.1 Aeroplanes

- (1) Pre-flight procedures
 - (a) Aircraft knowledge
 - (b) Mass and balance
 - (c) Performance calculations
 - (d) Attention to weather and minima
 - (e) Pre-flight inspection
 - (f) Engine starting
 - (g) Pre-taxi checks
 - (h) Taxiing checks
 - (i) Pre-take-off procedures
 - (j) ATC/Radio procedures
 - (k) Safety considerations
- (2) Take-off
 - (a) Pre-take-off briefing
 - (b) Normal take-off
 - (c) After take-off checks
 - (d) Instrument flying accuracy
 - (e) Safety considerations
- (3) Departure
 - (a) Compliance with SID/ATC clearance
 - (b) Identification of aids/altimeter setting
 - (c) Instrument flying accuracy
 - (d) ATC liaison
 - (e) Climbing
 - (f) Climbing turns
 - (g) Levelling off
 - (h) Safety considerations

- (4) General handling
 - (a) Straight and level
 - (b) Steep turns (45° bank) left and right
 - (c) Flight at minimum speed
 - (d) Stall (clean) recovery with power
 - (e) Stall (clean) recovery without power
 - (f) Stall in approach configuration (with power)
 - (g) Level flight cruise
 - (h) Climbing and descending turns
 - (i) Recovery from unusual attitudes
 - (j) Ice protection procedures (simulated if required)
 - (k) Tracking NDB/VOR/RNAV
 - (l) Radio procedures
 - (m) Safety considerations
- (5) Navigation
 - (a) Navigation log/plan
 - (b) Revision of ETA
 - (c) Log keeping
 - (d) Accuracy of navigation
 - (e) Accuracy of instrument flying
 - (f) ATC procedures and altimeter setting
 - (g) Safety considerations
- (6) Precision approach
 - (a) Aerodromes arrival procedures/STARS
 - (b) Identification of aids/altimeter setting
 - (c) Approach and landing briefing
 - (d) Descent/approach/landing checks
 - (e) Holding
 - (f) Instrument flying accuracy
 - (g) Go-around from DA
 - (h) Missed approach procedure
 - (i) ATC procedures/compliance
 - (j) Safety considerations

- (7) Non-precision approach
 - (a) Identification of aids/altimeter setting
 - (b) Approach and landing briefing
 - (c) Approach and landing checks
 - (d) Holding
 - (e) Compliance with published procedure
 - (f) Approach timing
 - (g) Instrument flying accuracy
 - (h) ATC liaison and compliance
 - (i) Fuel/engine management
 - (j) Icing procedures (simulated if required)
 - (k) Safety considerations
- (8) Action after flight
 - (a) Shutdown procedures
 - (b) Securing procedures
 - (c) Post flight inspection
 - (d) Safety considerations
- (9) Multi-engine flight (if applicable)
 - (a) Simulated engine failure during take-off
 - (b) Simulated engine failure during approach
 - (c) Asymmetric approach and landing
 - (d) Engine failure procedures
 - (e) Safety considerations
 - (f) ATC procedures
- (10) Abnormal and emergency procedures
 - (a) Engine fire during start and in the air
 - (b) Alternate landing gear extension
 - (c) Electrical failure
 - (d) Brake failure
 - (e) Smoke or fire in the cabin
 - (f) Trim system problems
 - (g) Radio failure
 - (h) Other (state)

(11) General

- (a) Decision-making ability
- (b) Overall safety considerations
- (c) General smoothness and coordination
- (d) Ability to plan ahead
- (e) Overall impression

1.2 Helicopters

(1) Pre-flight checks and preparation

- (a) Helicopter exterior visual inspection; location of each item and purpose of inspection
- (b) Cockpit inspection
- (c) Starting procedures, radio and navigation equipment check, selection and setting of navigation and communication frequencies
- (d) Taxiing/air taxiing in compliance with air traffic control instructions or on instructions of a designated examiner
- (e) Pre-take-off procedures and checks

(2) Take-offs

- (a) Take-offs (various profiles)
- (b) Cross wind take-off (if practicable)
- (c) Take-off at maximum take-off mass (actual or simulated maximum take-off mass)
- (d) Take-offs with simulated engine failure:
 - (i) Shortly before reaching TDP
 - (ii) Shortly after reaching TDP

(3) Flight manoeuvres and procedures

- (a) Turns
- (b) Landings (various profiles)
 - (i) Landing following simulated engine failure before LDP
 - (ii) Landing following simulated engine failure after LDP
- (c) Normal and abnormal operations of the following systems and procedures:

- (i) Engine
 - (ii) Air conditioning (heating, ventilation)
 - (iii) Pitot/static system
 - (iv) Fuel system
 - (v) Electrical system
 - (vi) Hydraulic system
 - (vii) Flight control and trim-system
 - (viii) Anti- and de-icing system
 - (ix) Autopilot/Flight Director
 - (x) Stability augmentation devices
 - (xi) Weather radar, radio altimeter, transponder
 - (xii) Area navigation system
 - (xiii) Landing gear system
 - (xiv) Tail rotor control failure (if applicable)
 - (xv) Tail rotor loss (if applicable)
 - (xvi) Auxiliary power unit
 - (xvii) Radio, navigation equipment, instruments flight management system
 - (d) Abnormal and emergency procedures
 - (i) Fire drills (including evacuation if applicable)
 - (ii) Smoke control and removal
 - (iii) Engine failures, shut down and restart at a safe height
 - (iv) Fuel dumping (simulated)
 - (v) Autorotation descent
 - (vi) Autorotative landing or power recovery
 - (vii) Incapacitation of crew member
 - (viii) Other emergency procedures as outline in the appropriate Flight Manual
 - (e) Turns with 30° bank, 180° to 360° left and right, by sole reference to instruments
- (4) Instrument Flight Procedures
- (a) Instrument take-off
 - (b) Adherence to departure and arrival routes and ATC instructions
 - (c) Holding procedures

- (d) ILS-approaches down to CAT I decision height
 - (i) Manually, without Flight Director
 - (ii) Manually, with Flight Director
 - (iii) With coupled autopilot
 - (iv) Manually, with one engine simulated inoperative
- (e) NDB or VOR/LOC-approach down to the minimum descent altitude
- (f) Circling approach
- (g) Missed approach procedures
 - (i) Go-around with all engines operating after an ILS approach on reaching decision height
 - (ii) Other missed approach procedures
 - (iii) Go-around with one engine simulated inoperative, after an ILS approach, on reaching decision height
- (5) Type rating for instrument approaches down to a decision height of less than 60 m (200 ft) (CAT II/III)
 - (a) Aborted take-off, at take-off weather minima
 - (b) ILS approach down to a decision height applied for using flight guidance system standard procedures of crew coordination
 - (c) Go-around
 - (d) Landing(s)
- (6) Use of optional equipment.

2. Conducting of skill tests

- (1) The skill test must be conducted by a Grade I or Grade II flight instructor, designated examiner.
- (2) The skill test must be preceded by an oral examination on, but not limited to -
 - (a) normal, abnormal and emergency procedures;
 - (b) limitations;
 - (c) systems knowledge; and
 - (d) the applicable Air Law, where appropriate.

3. Skill test report

(1) Completion

The flight instructor or designated examiner conducting the skill test must complete the skill test report contained in form MZ 61-35.

(2) Assessment

All the procedures and manoeuvres must be assessed as prescribed on the test form.

61.19.5 APPLICATION FOR TYPE RATING

1. Form of application

The application form for the issuing of a type rating is contained in form MZ 61-09, which is available from the Director General.

2. Skill test report

The skill test report that must accompany an application for the issuing of a type rating is contained in form MZ 61-35, which is available from the Director General.

3. Form of temporary type rating certificate

A temporary rating certificate is issued on the form attached to the license, and certified on the application form.

61.19.6 ISSUING OF TYPE RATING

1. Form of rating

A type rating is issued on the form determined by the Director General.

61.19.9 NOTIFICATION OF ADDITION OF TYPE TO A GROUP TYPE RATING

1. Requirements for endorsement

The requirements for an endorsement are the following:

- (1) The endorsement must be made in the column marked "Details of flight and remarks"; and
- (2) the endorsement must contain the following particulars:
 - (a) An indication of the type and registration marks of the aircraft;
 - (b) the words "Regulation 61.18.9 complied with";
 - (c) the signature of the flight instructor;
 - (d) the license number of the flight instructor; and
 - (e) the date.

2. Form of notification

The form, in which the notification for the addition of an aircraft type to a group type rating must be made, is contained on the application form MZ 61-09.

61.19.10 NOTIFICATION OF ADDITION OF TYPE RATING BY NAME

1. Requirements for endorsement

The requirements for the addition of a type rating are the following:

- (1) The endorsement must be made in the column marked "Details of flight and remarks"; and
- (2) the endorsement must contain the following particulars:
 - (a) An indication of the type and registration marks of the aircraft;
 - (b) the words "Regulation 61.19.10 complied with";
 - (c) the signature of the flight instructor or designated examiner;
 - (d) the license number of the flight instructor or designated examiner; and
 - (e) the date.

2. Form of notification

The form, in which the notification for the addition of a type rating by name must be made, is contained on the application form MZ 61-09.

61.18.11 RENEWAL (TYPE RATING)

1. Proficiency check

- (1) The proficiency check required for the renewal of a type rating, is the skill test referred to in TS 61.19.4.
- (2) The proficiency check must be conducted by an appropriately type rated flight instructor or designated examiner.
- (3) The proficiency check for every alternate renewal of a type rating for piston-engine aeroplanes with a maximum certificated mass of 5 700 kilograms or less, if the type rating is for single-engine and multi-engine aeroplanes, must be conducted in a multi-engine aeroplane.
- (4) The proficiency check for every alternate renewal of a type rating for a piston-engine aeroplane with a maximum certificated mass exceeding 5 700 kilograms -
 - (a) if the type rating is for single-engine aeroplanes, must be conducted in the type of aeroplane with the highest maximum certificated mass; or
 - (b) if the type is for single-engine and multi-engine aeroplanes, must be conducted in a multi-engine aeroplane.
- (5) The proficiency check for every alternate renewal of a type rating for a turbo-propeller aeroplane -
 - (a) if the type rating is for single-engine aeroplanes, must be conducted in the type of aeroplane with the highest maximum certificated mass; or
 - (b) if the type is for single-engine and multi-engine aeroplanes, must be conducted in a multi-engine aeroplane.
- (6) The proficiency check for every alternate renewal of a type rating for a turbojet aeroplane -
 - (a) if the type rating is for single-engine aeroplanes, must be conducted in the type of aeroplane with the highest maximum certificated mass; or
 - (b) if the type is for single-engine and multi-engine aeroplanes, must be conducted in a multi-engine aeroplane.
- (7) The proficiency check for every alternate renewal of a type rating for any other aircraft, other than a helicopter, a glider, a microlight aeroplane or a free balloon
 - (a) if the type rating is for single-engine aircraft, must be conducted in the type of aircraft with the highest maximum certificated mass; or
 - (b) if the type is for single-engine and multi-engine aircraft, must be conducted in a multi-engine aircraft.

2. Proficiency check report

The proficiency check report that must accompany an application for the renewal of a type rating is form MZ 61-35, which is available from the Director General.

3. Form of application

The application form for the renewal of a type rating is contained in form MZ 61-09.

4. Form of temporary type rating certificate

A temporary type rating certificate is issued on the form contained on the license.

5. Form of renewal

A type rating is renewed in the form determined by the Director General. The Flight Instructor or Designated Examiner must sign the renewal page within the license document before the renewal is effective.

61.19.12 REISSUE (TYPE RATING)

1. Skill test report

The skill test report that must accompany an application for the reissuing of a type rating is contained in form MZ 61-35.

2. Form of application

The application form for the reissuing of a type rating is contained in form MZ 61-09, which is available from the Director General.

3. Form of reissue

A type rating is reissued on the form determined by the Director General.

4. Form of temporary type rating certificate

A temporary type rating certificate is issued on the form contained in the license.

61.20.3 TRAINING (INSTRUMENT RATING)

1. Aim of training course

The aim of the instrument rating (I/R) training course is to train pilots to the level of proficiency necessary to obtain the instrument rating and to operate on aircraft under IFR in IMC.

The applicant must be the holder of at least a valid private pilot license.

The applicant must complete the course module in one continuous approved course of training. The course of theoretical instruction must be completed within 18 months and the flight training within 24 months of passing the theoretical examinations.

The course comprises:

- (1) A theoretical knowledge course to the instrument rating knowledge level; and
- (2) instrument flight instruction.

2. Theoretical knowledge course

The theoretical knowledge course comprises at least 270 hours of instruction, of which 120 hours may be monitored self study by means of assignments, and should include classroom work, interactive video, slide/tape presentation, computer based training and learning carrels, where applicable.

The 250 hours of instruction should preferably be divided as follows:

Subject	Hours
Air law and ATC procedure	30
Aircraft general knowledge	30
Flight performance and planning	50
Human performance and limitations	10
Meteorology	50
Navigation	70
Operational procedures	10
Communications	20

3. Instrument rating theoretical knowledge course syllabus

The theoretical knowledge course syllabus for the instrument rating is the relevant elements contained in the Generic Theoretical Knowledge Course Syllabus contained in Technical Standard 61.01.30.

Practical training course Aircraft I/R	Sim	Dual	Solo	Acc Total	SPIC	VFR	IFR	WE	M/E
Exercise									
Instrument Flying	20	10		30			30	10	
Navigation IFR		20		50	3		20	20	
I/R Flight Test		3*		50			3	3	
Totals (53)	20	33			3		53	33	
Aircraft I/R	20	10	3*	30	3		30	10	10
Instrument flying									
Navigation (IFR)	5	10		40			10	10	3
Multi-engine		10		55			15		
I/R Flight Test				58			3		
Totals (58)	25	30	3		3		58	20	13

* The 3 hours required for the flight test is additional and the 3 hours instrument flying required in the aircraft is not to be used.

3.1 Single-engine I/R

This course is for the pilot who wants fly single-engine aeroplanes under IFR in IMC. The course assumes that the applicant has at least 50 hours cross country time as pilot-in-command on aeroplanes or helicopters including at least 10 hours on aeroplanes. The course includes 50 hours of flight instruction for a private pilot license holder. The holder of a commercial pilot license may have the total I/R flight instruction time reduced by five hours. Of the total of 50 hours up to 20 hours may be accumulated in a simulator.

3.2 The Multi-Engine I/R

This course requires a total of 55 hours of instrument flight time under instruction of which 25 hours may be accumulated in a simulator. The holder of a commercial pilot license may have the total instruction time reduced by five hours.

Student pilot-in-command time is not considered, except in the case of a successful flight test, as this is not an integrated course.

Note: In the case of an integrated commercial pilot license with instrument rating, at least 70 hours of IFR time is required, some of which may be as student pilot-in-command.

3.3 The flying/ simulator Syllabus

At least the following aspects must be addressed during the training prior to the skill test:

- (1) Pre-flight procedures for IFR flights, the use of flight manuals and appropriate air traffic services documents in the preparation of an FIR flight plan;
- (2) normal, abnormal and emergency procedures covering at least -

- (a) transition from visual to instrument flight on take-off;
 - (b) standard instrument departures and arrivals;
 - (c) en route FIR procedures;
 - (d) holding procedures;
 - (e) instrument approaches to specified minima;
 - (f) missed approach procedures; and
 - (g) landings from instrument approaches including circling; in flight manoeuvres and particular flight characteristics; and
- (3) in the case of a multi-engine instrument rating, exercises in a multi-engine aeroplane including the operation of the aeroplane with sole reference to instruments with one engine simulated inoperative and an engine shut down and restarted at a safe altitude unless done in a simulator.

61.20.4 THEORETICAL KNOWLEDGE EXAMINATION (INSTRUMENT RATING)

1. Examination

An applicant for the issuing of an instrument rating must pass a written theoretical knowledge examination on -

- (1) practical air navigation including the use of aeronautical charts, or navigation by dead-reckoning and by radio, and the use and adjustment of flight instruments;
- (2) radio systems provided to aid navigation, approach and landing, the manner in which such systems are used in flight under IFR, the procedures associated therewith and the assessment of reliability under operational conditions of the indications obtained from such radio aids;
- (3) elementary meteorology, the elementary principles of weather forecasting and the arrangements and procedures for the issue of aviation meteorological reports;
- (4) IFR and flight planning in relation to air traffic services, aircraft performance and forecast meteorological conditions, including the estimation of time of arrival at points along a route the fuel quantities required for a flight and the anticipation of such flight plan modification as may prove necessary owing to changes in flight conditions;
- (5) flight planning and mass and balance problems appropriate to the type of aircraft used for the test; and
- (6) aviation legislation.

2. Conducting of theoretical knowledge examination

The written theoretical knowledge examination is conducted by the Director General.

3. Duties of Director General

- (1) The Director General must publish in an AIC -
 - (a) the dates on which examinations are to be written;
 - (b) the latest date by which applications for each such examination are to reach the Director General;
 - (c) the format and duration of each examination; and
 - (d) the fees payable for such examinations.
- (2) The entry fee paid for any examination may, upon request by the candidate, be refunded or transferred to a subsequent examination: Provided that an acceptable reason for such request is furnished.

4. Admission to examinations

Admission to a written theoretical examination is subject to the following conditions:

- (1) An application for admission to the examination must be made on the relevant application form;
- (2) the application must be accompanied by the fee prescribed in Part 187 of the MOZ-CAR;
- (3) the application and fee must be submitted to the Director General to reach the Director General's office on or before the closing date published for such examination;
- (4) the rules and instructions determined by the Director General for such examination, must be complied with, which rules and instructions must be supplied to a candidate upon his or her admission for a particular examination; and
- (5) a candidate must subject himself or herself to disqualification from future examinations for a period not exceeding 12 months if the rules and instructions referred to in subparagraph (4) are contravened and the candidate will be deemed to have failed the examination in which such contravention occurred.

5. Remarking of examination scripts

- (1) A candidate who has failed one or more examination papers with a mark between 66% and 69%, may, on payment of the fee prescribed in Part 187 of the MOZ-CAR, apply for the remarking of the script or scripts concerned.
- (2) Application for the remarking of an examination script or scripts must be made in writing to the Director General and such application, accompanied by the fee, must reach the Director General not later than one month after the examination results were published.
- (3) The decision of the Director General on any remarked examination script, is final.

61.20.5 SKILL TEST (INSTRUMENT RATING)

1. Procedures and manoeuvres

An applicant for the issuing of an instrument rating must demonstrate the following procedures and manoeuvres by reference to instruments only:

- (1) The solving of simple problems of dead-reckoning navigation;
- (2) the fixing of the aircraft's position;
- (3) the execution of the communications procedure at a given aerodrome and the execution of given track interceptions, for the departure, descent and approach procedures with the aid of navigational facilities, including an ILS, in a single-engine aeroplane or helicopter, as the case may be, or in a simulator: Provided that where an ILS is not available, the Director General may, on submission to him or her by the applicant of a certificate issued by a Category A, Grade I or Grade II flight instructor or a Category B, Grade I or Grade II flight instructor, stating that the applicant is proficient in the execution of ILS approach procedures, exempt the applicant from such test.

2. Conducting the skill test

- (1) the skill test must be conducted by a designated examiner.
- (2) the skill test must be preceded by an oral examination on, but not limited to -
 - (a) normal, abnormal and emergency procedures;
 - (b) limitations;
 - (c) systems knowledge; and
 - (d) the applicable Air Law, where appropriate.

3. Skill test report

- (1) Completion

The designated examiner conducting the skill test, must complete the skill test report contained in form MZ 61-33, which is available from the Director General.

- (2) Assessment

All the procedures and manoeuvres must be assessed as satisfactory or unsatisfactory.

61.20.6 APPLICATION FOR INSTRUMENT RATING

1. Form of application

The application form for the issuing of an instrument rating, is contained in form MZ 61-07, which is available from the Director General.

2. Skill test report

The skill test report that must accompany an application for the issuing of an instrument rating, is contained in form MZ 61-33, which is available from the Director General.

3. Form of temporary instrument rating certificate

A temporary instrument rating certificate is issued on the form contained in the license.

61.20.7 ISSUING OF INSTRUMENT RATING

1. Form of rating

An instrument rating is issued on the form determined by the Director General.

61.20.11 RENEWAL (INSTRUMENT RATING)

1. Proficiency check

The proficiency check required for the renewal of an instrument rating, is the skill test referred to in CATS 61.20.5.

2. Proficiency check report

The proficiency check report that must accompany an application for the renewal of an instrument rating, is contained in form MZ 61-33, which is available from the Director General.

3. Form of application

The application form for the renewal of an instrument rating, is contained in form MZ 61-07, which is available from the Director General.

4. Form of temporary instrument rating certificate

A temporary instrument rating certificate is issued on the form contained in the license.

5. Form of renewal

An instrument rating is renewed on the form determined by the Director General.

61.20.12 REISSUE (INSTRUMENT RATING)

1. Skill test report

The skill test report that must accompany an application for the reissuing of an instrument rating, is contained in form MZ 61-33, which is available from the Director General.

2. Form of application

The application form for the reissuing of an instrument rating, is contained in form MZ 61-07, which is available from the Director General.

3. Form of reissue

An instrument rating is reissued on the form determined by the Director General.

4. Form of temporary instrument rating certificate

A temporary instrument rating certificate is issued on the form contained in the license.

61.21.5 SKILL TEST (GR 1 INSTRUCTOR - A)

1. Procedures and manoeuvres

An applicant for the issuing of a Grade I aeroplane flight instructor rating must demonstrate the following procedures and manoeuvres:

(1) Theoretical oral

Only two of the following subjects are to be selected

- (a) Air law.
- (b) Aircraft general knowledge.
- (c) Flight performance and planning.
- (d) Human performance and limitations.
- (e) Meteorology.
- (f) Navigation.
- (g) Operational procedures.
- (h) Principles of flight.
- (i) Training administration.

(2) Selected main exercise - pre-flight briefing

- (a) Visual presentation.
- (b) Technical accuracy.
- (c) Clarity of explanation.
- (d) Clarity of speech.
- (e) Instructional technique.
- (f) Use of models and aids.
- (g) Student participation.

(3) Selected main exercise - flight

- (a) Arrangement of demonstration.
- (b) Synchronisation of pattern with demo.
- (c) Correction of faults.
- (d) Aircraft handling/accuracy of flight.
- (e) Instructional technique.
- (f) Safety considerations.
- (g) ATC procedures and liaison.

(4) Other exercises

- (a) Primary effects of controls.
- (b) Secondary effects of controls.
- (c) Stalling (various configurations).
- (d) Spinning (where applicable).
- (e) Forced landing.
- (f) Take-off and landing.
- (g) Climbing and descending

(5) Multi-engine flight (if applicable)

- (a) Simulated engine failure during take-off.
- (b) Simulated engine failure during approach.
- (c) Asymmetric approach and landing.
- (d) Engine failure procedures.
- (e) Safety considerations.
- (f) ATC procedures.

(6) Abnormal and emergency procedures

The applicant is expected to indicate the actions to be taken and carry out touch drills but is not expected to perform any operating action. This section may be combined with other sections.

- (a) Engine fire during start and in the air.
- (b) Alternate landing gear extension.
- (c) Electrical failure.
- (d) Brake failure.
- (e) Smoke or fire in the cabin.
- (f) Trim system problems.
- (g) Radio failure.
- (h) Other (state).

(7) General

- (a) Decision-making ability.
- (b) Overall safety considerations.
- (c) General smoothness and co-ordination.
- (d) Ability to plan ahead.
- (e) Overall impression.

2. Conducting the skill test

The skill test must be conducted by a designated examiner.

3. Skill test report

(1) Completion

The designated examiner conducting the skill test, must complete the skill test report contained in form MZ 61-34.

(2) Assessment

All the procedures and manoeuvres must be assessed as prescribed on the test form.

61.21.6 APPLICATION FOR GRADE 1 INSTRUCTOR RATING –AEROPLANES

1. Form of application

The application form for the issuing of an instructor rating, is contained in form MZ 61-08, which is available from the Director General.

2. Skill test report

The skill test report that must accompany an application for the issuing of an instructor rating, is contained in form MZ 61-34, which is available from the Director General.

3. Form of temporary instructor rating certificate

A temporary instructor rating certificate is issued on the form contained in the license.

61.21.7 ISSUING OF GRADE 1 INSTRUCTOR RATING -AEROPLANES

1. Form of rating

A Grade 1 instructor rating is issued on the form determined by the Director General.

61.21.10 RENEWAL (GR 1 INSTRUCTOR - A)

1. Proficiency check

The proficiency check required for the renewal of an instructor rating, is the skill test referred to in CATS 61.21.5.

In addition, the Instructor must:

- (1) Submit of a research project (dissertation) on an aviation topic approved by the Director General OR
- (2) Prepare and present a lecture on an aviation topic of his or her choice which is relevant to the Mozambique aviation environment at the time, the duration of which must be at least 45 minutes.

2. Proficiency check report

The proficiency check report that must accompany an application for the renewal of an instructor rating, is contained in form MZ 61-34, which is available from the Director General.

3. Form of application

The application form for the renewal of an instructor rating, is contained in form MZ 61-08, which is available from the Director General.

4. Form of temporary instructor rating certificate

A temporary instructor rating certificate is issued on the form contained in the license.

5. Form of renewal

An instructor rating is renewed on the form determined by the Director General.

61.21.11 REISSUE (GR 1 INSTRUCTOR - A)

1. Skill test report

The skill test report that must accompany an application for the reissuing of an instructor rating, is contained in form MZ 61-34, which is available from the Director General.

2. Form of application

The application form for the reissuing of an instructor rating, is contained in form MZ 61-08, which is available from the Director General.

3. Form of reissue

An instructor rating is reissued on the form determined by the Director General.

4. Form of temporary instructor rating certificate

A temporary instructor rating certificate is issued on the form contained in the license.

61.22.3 TRAINING (GR 2 INSTRUCTOR - A)

1. Theoretical knowledge training requirements

The training referred to in TS 63.23.3 constitutes the training requirements for this technical standard.

The training course must cover the whole Flight Instructor Grade III syllabus in detail, but with specific attention to the assessment of student performance in the ground and flight training.

2. Practical training requirements

The following general outline will provide the guidelines to be followed in preparing the Grade III flight instructor for a Grade II skill test.

(1) Ground Briefing Procedures

Review the candidate's training file and ensure that all deficiencies have been dealt with. Select 4 long briefings at random and ensure that the applicant is fully competent at delivering the briefings to the standard required of a grade II instructor. This means that he or she is able to deliver the briefing logically and fluently in the required format and is able to correctly field the student pilot's questions without fumbling for the answers.

(2) In-flight Procedures

The applicant should undergo at least 3 one hour long sessions with the Chief Flying instructor or his/her designate focussing on the standard of patter being delivered and the applicant's ability to recognise problem areas and provide the necessary corrective patter to the standard required of a Grade II instructor. The standard required of a Grade II instructor is that the patter and demonstrations are smoothly co-ordinated, the instructor does not fumble for words and is able to demonstrate and talk at the required pace. The applicant should be consistently using the correct terminology with there being no doubt about what is being referred to or being taught in each lesson. The sessions should include day, night and, in the case of aeroplanes, instrument flying training.

(3) Debriefing Procedures

The applicant for a Grade II instructor rating should be thoroughly acquainted with and skilled in debriefing or facilitating a review of the trainee pilot's performance.

(4) General

The applicant for a Grade II instructor rating should have a good knowledge of safety and the functioning of the Part 141 approved training organisation's safety system; how accident prevention programmes work; and understand the regulatory environment applicable to flight training. Prior to the practical

skill test the applicant for a grade II instructor rating will be required to answer oral questions on the following subjects -

- (a) Air Law;
- (b) Aircraft General Knowledge;
- (c) Flt Performance & Planning;
- (d) Human Performance & Limitations;
- (e) Meteorology;
- (f) Navigation;
- (g) Operational Procedures;
- (h) Principles of Flight; and
- (i) Training Administration.

61.22.4 THEORETICAL KNOWLEDGE EXAMINATION (GR 2 INSTRUCTOR - A)

1. Requirements

An applicant for the issuing of a Grade II aeroplane flight instructor rating must comply with the following theoretical knowledge requirements:

The Grade II instructor must pass a classroom observation/assessment by a Grade I Flight Instructor in a topic assigned by the Instructor, demonstrating his ability to transfer his knowledge to the student(s), and

The Grade II instructor must demonstrate his knowledge regarding the assessment of student performance in the ground and flight training.

61.22.5 SKILL TEST (GR 2 INSTRUCTOR - A)

1. Procedures and manoeuvres

An applicant for the issuing of a Grade II aeroplane flight instructor rating must demonstrate the following procedures and manoeuvres:

(1) Theoretical oral

Only two of the following subjects are to be selected

- (a) Air law.
- (b) Aircraft general knowledge.
- (c) Flight performance and planning.
- (d) Human performance and limitations.
- (e) Meteorology.
- (f) Navigation.
- (g) Operational procedures.
- (h) Principles of flight.
- (i) Training administration.

(2) Selected main exercise - pre-flight briefing

- (a) Visual presentation.
- (b) Technical accuracy.
- (c) Clarity of explanation.
- (d) Clarity of speech.
- (e) Instructional technique.
- (f) Use of models and aids.
- (g) Student participation.

(3) Selected main exercise - flight

- (a) Arrangement of demonstration.
- (b) Synchronisation of patter with demo.
- (c) Correction of faults.
- (d) Aircraft handling/accuracy of flight.
- (e) Instructional technique.
- (f) Safety considerations.
- (g) ATC procedures and liaison.

(4) Other exercises

- (a) Primary effects of controls.
- (b) Secondary effects of controls.
- (c) Stalling (various configurations).
- (d) Spinning (where applicable).
- (e) Forced landing.
- (f) Take-off and landing.
- (g) Climbing and descending.

(5) Multi-engine flight (if applicable)

- (a) Simulated engine failure during take-off.
- (b) Simulated engine failure during approach.
- (c) Asymmetric approach and landing.
- (d) Engine failure procedures.
- (e) Safety considerations.
- (f) ATC procedures.

(6) Instrument exercises

- (a) Basic attitude flying.
- (b) Interception of bearings to and from NDB.
- (c) Interception of VOR radials.
- (d) Non-precision approach demonstration.
- (e) Precision approach demonstration.

(7) Abnormal and emergency procedures

The applicant is expected to indicate the actions to be taken and carry out touch drills but is not expected to perform any operating action. This section may be combined with other sections.

- (a) Engine fire during start and in the air.
- (b) Alternate landing gear extension.
- (c) Electrical failure.
- (d) Brake failure.
- (e) Smoke or fire in the cabin.
- (f) Trim system problems.
- (g) Radio failure.
- (h) Other (state).

- (8) General
 - (a) Decision making ability.
 - (b) Overall safety considerations.
 - (c) General smoothness and coordination.
 - (d) Ability to plan ahead.
 - (e) Overall impression.

2. Conducting the skill test

The skill test must be conducted by a designated examiner.

3. Skill test report

- (1) Completion

The designated examiner conducting the skill test, must complete the skill test report contained in form MZ 61-34, which is available from the Director General.

- (2) Assessment

All the procedures and manoeuvres must be assessed as prescribed on the test form.

61.22.6 APPLICATION FOR GRADE 2 INSTRUCTOR RATING -AEROPLANES

1. Form of application

The application form for the issuing of an instructor rating, is contained in form MZ 61-08, which is available from the Director General.

2. Skill test report

The skill test report that must accompany an application for the issuing of an instructor rating, is contained in form MZ 61-34, which is available from the Director General.

3. Form of temporary instructor rating certificate

A temporary instructor rating certificate is issued on the form contained in the license.

61.22.7 ISSUING OF GRADE 2 INSTRUCTOR RATING –AEROPLANES

1. Form of rating

A Grade 2 instructor rating is issued on the form determined by the Director General.

61.22.9 PRIVILEGES (GR 2 INSTRUCTOR – A)

1. Multi-engine training

The Grade II Flight Instructor may only provide training in multi-engine aeroplanes if:

- (1) he/she is the holder of a multi-engine type and class rating; or
- (2) he/she has passed the multi-engine type rating training course, theoretical knowledge examination and practical skill test prescribed under Subpart 19 and has made application for his multi-engine type and class rating; and
- (3) he/she has been issued with a temporary multi-engine type rating.

2. Multi-engine instructor skill test

The multi-engine type rating skill test required to be passed by the Grade II Flight Instructor is the skill test referred to in regulation 61.19.04.

61.22.10 RENEWAL (GR 2 INSTRUCTOR - A)

1. Proficiency check

The proficiency check required for the renewal of an instructor rating, is the skill test referred to in CATS 61.22.5.

2. Proficiency check report

The proficiency check report that must accompany an application for the renewal of an instructor rating, is contained in form MZ 61-34, which is available from the Director General.

3. Form of application

The application form for the renewal of an instructor rating, is contained in form MZ 61-08, which is available from the Director General.

4. Form of temporary instructor rating certificate

A temporary instructor rating certificate is issued on the form contained in the license.

5. Form of renewal

An instructor rating is renewed on the form determined by the Director General.

61.22.11 REISSUE (GR 2 INSTRUCTOR - A)

1. Skill test report

The skill test report that must accompany an application for the reissuing of an instructor rating, is contained in form MZ 61-34, which is available from the Director General.

2. Form of application

The application form for the reissuing of an instructor rating, is contained in form MZ 61-08, which is available from the Director General.

3. Form of reissue

An instructor rating is reissued on the form determined by the Director General.

4. Form of temporary instructor rating certificate

A temporary instructor rating certificate is issued on the form contained in the license.

61.23.2 TRAINING (GR 3 INSTRUCTOR - A)

1. Aim of training course

The aim of the Grade III instructor rating training course is to train initial instructors to the level of proficiency necessary to obtain the instructor rating to enable them to conduct theoretical and practical instruction for ab initio pilots.

1.1 General

- (1) The course is designed to give the applicant adequate training in ground and flying instructional techniques based upon established teaching methods.
- (2) On successful completion of the course and final test, the applicant will be issued with a Grade III aeroplane flight instructor rating permitting the holder to give ground and flight training appropriate to the issuing of a private pilot license (aeroplane) or a commercial pilot license (aeroplane).
- (3) The flight instructor course should stress 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 maturity and judgement including an understanding of adults, their behavioural attitudes and variable levels of education.
- (4) With the exception of paragraph 2 below, all the subject detail contained in the ground and flight training syllabus is complementary to the commercial pilot (aeroplane) course syllabus and should already be known by the applicant. The purpose of the course is to -
 - (a) refresh and bring up to date 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 private pilot level.
- (5) During the course, the applicant should be made aware of his or her own attitudes to the importance of flight safety. The flight instructor is the critical link in the flight training process and his or her attitude to flight safety has a major impact upon student pilots, improving safety awareness should therefore 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 instructors task and to achieve this the course curriculum, in terms of

goals and objectives, should comprise at least the items contained in paragraphs 2 and 3 below.

1.2 Ground training

The ground training consists of all instruction given on the ground for the purpose of the course and includes classroom lectures, tutorials, long briefings and directed private study, but excludes pre-flight briefings and post flight discussions which form part of the flight training.

1.3 Flight training

The student instructor must occupy for at least 20 hours in total, the seat normally occupied by the flight instructor, except when acting as a student pilot on mutual flights.

1.4 Air exercises

- (1) The air exercises are similar to those used for the training of private pilots (aeroplane) 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. 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:
 - (a) The applicant's progress and ability;
 - (b) the weather conditions affecting the flight;
 - (c) the flight time available;
 - (d) instructional technique considerations; and
 - (e) the local operating environment

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.

2. Teaching and learning

2.1 The learning process

- (1) Motivation.
- (2) Perception and understanding.
- (3) Memory and its application.
- (4) Habits and transfer.
- (5) Obstacles to learning.

- (6) Incentives to learning.
- (7) Learning methods.
- (8) Rates of learning.

2.2 The teaching process

- (1) Elements of effective teaching.
- (2) Planning of instructional activity:
- (3) Teaching methods.
- (4) Teaching from the "known" to the "unknown".
- (5) Use of "lesson plans".

2.3 Training philosophies

- (1) Value of a structured (approved) course of training.
- (2) Importance of a planned syllabus.
- (3) Integration of ground and flight training.

2.4 Techniques of applied instruction

- (1) GROUND - Classroom instruction techniques
 - (a) Use of training aids.
 - (b) Group lectures.
 - (c) Individual briefings.
 - (d) Student participation/discussion.
- (2) FLIGHT - Airborne instruction techniques
 - (a) The flight deck environment.
 - (b) Techniques of applied instruction.
 - (c) Post flight and in-flight judgement and decision making.

2.5 Student evaluation and testing

- (1) Assessment of student performance
 - (a) The function of progress tests.
 - (b) Recall of knowledge.
 - (c) Translation of knowledge into understanding.
 - (d) Development of understanding into actions.
 - (e) The need to evaluate rate of progress.
- (2) Analysis of student errors

- (a) Establish the reason for errors.
- (b) Tackle major faults first, minor faults second.
- (c) Avoidance of over criticism.
- (d) The need for clear concise communication.

2.6 Training programme development

- (1) Lesson planning.
- (2) Preparation.
- (3) Explanation and demonstration.
- (4) Student participation and practice.
- (5) Evaluation.

2.7 Human performance and limitations relevant to flight instruction

- (1) Physiological factors.
- (2) Psychological factors.
- (3) Human information processing.
- (4) Behavioural attitudes.
- (5) Development of judgement and decision making.

2.8 Hazards involved in simulating systems failures and malfunctions in the aeroplane during flight

- (1) Selection of a safe altitude.
- (2) Importance of "touch drills".
- (3) Situational awareness.
- (4) Adherence to correct procedures.

2.9 Training administration

- (1) Flight/ground training records.
- (2) Pilot's personal flying log book.
- (3) The flight/ground curriculum.
- (4) Study material.
- (5) Official forms.
- (6) Aircraft flight/owner's manuals/pilot's operating handbooks. Flight authorisation papers.
- (7) Aircraft documents.
- (8) The private pilot license regulations.

3. Flight training syllabus contents

3.1 General

- (1) The briefing normally includes a statement of the aim and a brief allusion to principles of flight only if relevant. An explanation must be made 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.
- (2) The four basic components of the briefing will be -
 - (a) the aim;
 - (b) principles of flight (briefest reference only);
 - (c) the air exercise(s) (what, and how and by whom); and
 - (d) airmanship (weather and flight safety).
- (3) Stall/spin awareness and avoidance training consists of exercises 10A and 1013.

3.2 Planning of flight lessons

The preparation of lesson plans is an essential prerequisite of good instruction and the student instructor must be given supervised practice in the planning and practical application of flight lesson plans.

3.3 General considerations

- (1) The student instructor should complete flight training to practise the principles of basic instruction at the private pilot (aeroplane) level.
- (2) During this training, except when acting as a student pilot for mutual flights, the student instructor must occupy the seat normally occupied by the flight instructor.
- (3) It is to be noted that airmanship is a vital ingredient of all flight operations. Therefore, in the air exercises the relevant aspects of airmanship must be stressed at the appropriate times during each flight.

3.4 Long briefings and air exercises.

3.4.1 Exercise 1: Aeroplane familiarisation .

- (1) Long briefing
 - (a) Aeroplane familiarisation
 - (i) Objectives.
 - (ii) Introduction to the aeroplane.

- (iii) Explanation of the cockpit layout.
 - (iv) Aeroplane and engine systems.
 - (v) Check lists, drills, controls.
 - (vi) Differences when occupying the instructor's seat.
 - (b) Emergency drills
 - (i) Action in the event of fire in the air and on the ground - engine cabin and electrical.
 - (ii) Systems failures as applicable to type.
 - (iii) Escape drills - location and use of emergency equipment and exits.
- (2) Air exercise:
- (a) Familiarisation with the aeroplane
 - (i) Introduction to the aeroplane.
 - (ii) Explanation of the cockpit layout.
 - (iii) Aeroplane systems.
 - (iv) Check lists, drills, controls.
 - (b) Emergency drills
 - (i) Action in the event if fire in the air on the ground -engine/cabin/electrical.
 - (ii) System failure as applicable to type.
 - (iii) Escape drills - location and use of emergency equipment and exits.

3.4.2 Exercise 2: Preparation for and action after flight

- (1) Long briefing
 - (a) Objectives.
 - (b) Flight authorisation and aeroplane acceptance including technical log (if applicable) and certificate of maintenance.
 - (c) External checks.
 - (d) Internal checks.
 - (e) Student comfort, harness, seat or rudder pedal adjustment.
 - (f) Starting and warming up checks.
 - (g) Power checks.

- (h) Running down, system checks and switching off the engine.
- (i) Leaving the aeroplane, parking, security and picketing.
- (j) Completion of authorisation sheet and aeroplane serviceability documents.

(2) Air exercise

- (a) Flight authorisation and aeroplane acceptance.
- (b) Aircraft serviceability documents.
- (c) Equipment required for flight (maps etc.).
- (d) External checks.
- (e) Internal checks.
- (f) Student comfort, harness, seat or rudder pedal adjustment.
- (g) Starting and warming up checks.
- (h) Power checks.
- (i) Running down, system checks and switching off the engine.
- (j) Leaving the aircraft, parking, security and picketing.
- (k) Completion of authorisation sheet and aeroplane serviceability.
- (l) Documents.

3.4.3 Exercise 3 : Air experience

(1) Air exercise

- (a) Air experience.

3.4.4 Exercise 4: Effects of controls

(1) Long briefing

- (a) Objectives.
- (b) Function of primary controls - when laterally level and banked.
- (c) Further effect of ailerons and rudder.
- (d) Effect of inertia.
- (e) Effect of airspeed.
- (f) Effect of slipstream.

- (g) Effect of power.
- (h) Effect of trimming controls.
- (i) Effect of flaps.
- (j) Operation of mixture control.
- (k) Operation of carburettor heat control.
- (l) Operation of cabin heat/ventilation systems.
- (m) Effect of other controls (as applicable).
- (n) Airmanship.

(2) Air exercise

- (a) Primary effects of flying controls - when laterally level and banked.
- (b) Further effects of ailerons and rudder.
- (c) Effect of airspeed.
- (d) Effect of slipstream.
- (e) Effect of power.
- (f) Effect of trimming controls.
- (g) Effect of flaps.
- (h) Operation of mixture control.
- (i) Operation of carburettor heat control.
- (j) Operation of cabin heat/ventilation systems.
- (k) Effect of other controls as applicable.
- (l) Airmanship.

3.4.5 Exercise 5 : Taxiing

(1) Long briefing

- (a) Pre-taxi checks.
- (b) Starting, control of speed and stopping.
- (c) Engine handling.
- (d) Control of direction and turning (including manoeuvring in confined spaces).
- (e) Parking area procedures and precautions.
- (f) Effects of wind and use of flying controls.
- (g) Effects of ground surface.
- (h) Freedom of rudder movement.
- (i) Marshalling signals.

- (j) Instrument checks.
 - (k) Airmanship and air traffic control procedures.
 - (l) Common errors.
 - (m) Emergencies - steering failure/brake failure.
- (2) Air exercise
- (a) Pre taxiing checks.
 - (b) Starting, control of speed and stopping.
 - (c) Engine handling.
 - (d) Control of direction and turning.
 - (e) Turning in confined spaces.
 - (f) Parking area procedures and precautions.
 - (g) Effects of wind and use of flying control.
 - (h) Effects of ground surface.
 - (i) Freedom of rudder movement.
 - (j) Marshalling signals.
 - (k) Instrument checks.
 - (l) Airmanship and air traffic control procedures.
 - (m) Emergencies - steering failure/ brake failure.

3.4.6 Exercise 6: Straight and level flight

- (1) Long briefing
- (a) The forces.
 - (b) Relationship between power/airspeed and rate of climb (power curves maximum rate of climb (V_y)).
 - (c) Effect of mass.
 - (d) Effect of flaps.
 - (e) Engine considerations.
 - (f) Effect of density altitude.
 - (g) The cruise climb.
 - (h) Maximum angle of climb (V_x).
 - (i) Airmanship.
 - (j) Common errors.
- (2) Air exercise
- (a) Entry and maintaining the normal maximum rate climb.

- (b) Levelling off.
- (c) Levelling off at selected altitudes.
- (d) Climbing with flaps down.
- (e) Recovery to normal climb.
- (f) En route climb (cruise climb).
- (g) Maximum angle of climb.
- (h) Use of instruments to achieve precision flight.
- (i) Airmanship.

3.4.8 Exercise 8: Descending

- (1) Long briefing
 - (a) The forces.
 - (b) Glide descent angle - airspeed - rate of descent.
 - (c) Effect of flaps.
 - (d) Effect of wind.
 - (e) Effect of mass.
 - (f) Engine considerations.
 - (g) Power assisted descent - power airspeed - rate of descent.
 - (h) The cruise descent.
 - (i) The sideslip.
 - (j) Airmanship.
 - (k) Common errors.
- (2) Air exercise
 - (a) Entry and maintaining the glide.
 - (b) Levelling off.
 - (c) Levelling off at selected altitudes.
 - (d) Descending with flaps down.
 - (e) Powered descent - cruise descent (effect of power/airspeed).
 - (f) Side slipping (on suitable types).
 - (g) Use of instrument to achieve precision flight.
 - (h) Airmanship.

3.4.9 Exercise 9: Turning

- (1) Long briefing

- (a) The forces.
 - (b) Use of controls.
 - (c) Use of power.
 - (d) Maintenance of attitude and balance.
 - (e) Medium level turns.
 - (f) Climbing and descending turns.
 - (g) Slipping turns.
 - (h) Turning onto selected headings - use of gyro heading indicator and magnetic compass.
 - (i) Airmanship:
 - (j) Common errors.
- (2) Air exercise
- (a) Entry and maintaining medium level turns.
 - (b) Resuming level flight.
 - (c) Faults in the turn (incorrect pitch (bank/balance)).
 - (d) Climbing turns.
 - (e) Descending turns.
 - (f) Slipping turns (on suitable types).
 - (g) Turns to Selected headings, use of gyro heading indicator and compass.
 - (h) Use of instruments to achieve precision flight.
 - (i) Airmanship.

3.4.10 Exercise 10A: Slow flight

- (1) Long briefing
- (a) Aeroplane handling characteristics during slow flight at
 - (i) V_{s1} and $V_{so} + 10$ knots; and
 - (ii) V_{s1} and $V_{so} + 5$ knots.
 - (b) Slow flight during instructor induced distractions.
 - (c) Effect of overshooting in configurations where application of engine power causes a strong "nose up" trim change.
 - (d) Airmanship.
 - (e) Common errors.
- (2) Air exercise
- (a) General

- (i) Airmanship.
 - (ii) Safety checks.
 - (iii) Introduction to slow flight.
- (b) Controlled slow flight in the clean configuration at $V_{sl} + 10$ knots and with flaps down $V_{so} + 10$ knots
 - (i) Straight and level flight.
 - (ii) Level turns.
 - (iii) Climbing and descending,
 - (iv) Climbing and descending turns.
- (c) Controlled slow flight in the clean configuration at $V_{s1} + 5$ knots and with flaps down $V_{so} + 5$ knots
 - (i) Straight and level flight.
 - (ii) Level turns.
 - (iii) Climbing and descending.
 - (iv) Climbing and descending turns.
- (d) Descending "unbalanced" turns at low airspeed - the need to maintain balanced flight.
- (e) Instructor induced distractions during flight at low airspeed - the need to maintain balanced flight and a safe airspeed.
- (f) Effect of going around in configurations where application of engine power causes a strong "nose up" trim change.

3.4.11 Exercise 10B: Stalling

- (1) Long briefing
 - (a) Characteristics of the stall.
 - (b) Angle of attack.
 - (c) The effectiveness of the controls at the stall.
 - (d) Factors affecting the stalling speed
 - (i) Effect of flaps/ slats/ slots.
 - (ii) Effect of power/mass/C and G load factor.
 - (e) The Effects of unbalance at the stall.
 - (f) The symptoms of the stall.
 - (g) Stall recognition and recovery.
 - (h) Stalling and recovery
 - (i) Without power;
 - (ii) with power on; and
 - (iii) with flaps down.
 - (i) Recovering from incipient stalls in the landing and other configurations and conditions.

- (j) Recovering at the incipient stage during change of configuration.
- (k) Stalling and recovery at the incipient stage with "instructor induced" distractions.
- (l) Airmanship.
- (m) Common errors.
- (n) Consideration must be given to manoeuvre limitations and references to the owners/flight manual or pilot's operating handbook must also be made in relation to mass and balance limitations. These factors must also be covered in exercise 11A and 11B.
- (o) Maximum power climb (straight and turning flight to the point of stall with uncompensated yaw)
- (p) Stalling and recovery during manoeuvres involving more than 1 G (accelerated stalls, including secondary stalls and recoveries).
- (2) Air exercise
 - (a) Airmanship.
 - (b) The symptoms of the stall.
 - (c) Stall recognition and recovery.
 - (d) Recovery without power.
 - (e) Recovery with power.
 - (f) Recovery when a wing drops at the stall.
 - (g) Stalling with power "ON" and recovery.
 - (h) Stalling with flap "Down" and recovery.
 - (i) Maximum power climb (straight and turning flight) to the point of stall with uncompensated yaw - effect of unbalance at the stall when climbing power is being used.
 - (j) Stalling and recovery during manoeuvres involving more than 1 G (accelerated stalls, including secondary stalls and recoveries).
 - (k) Recoveries from incipient stalls in the landing and other configurations and conditions.
 - (l) Recoveries at the incipient stage during change of configuration. Instructor induced distractions during stalling.
 - (m) Consideration of manoeuvre limitations and the need to refer to the aeroplane manual and mass and balance

calculations. These factors must also be covered in exercise 11A and 11B.

3.4.12 Exercise 11A : Spin recovery at incipient stage

- (1) Long briefing
 - (a) Causes, stages, autorotation and characteristics of the spin.
 - (b) Recognition and recovery at the incipient stage - entered from various flight attitudes.
 - (c) Aeroplane limitations.
 - (d) Airmanship.
 - (e) Common errors.
- (2) Air exercise
 - (a) Aeroplane limitations.
 - (b) Airmanship.
 - (c) Safety checks.
 - (d) Recognition of an incipient stage spin.
 - (e) Recoveries from incipient spins entered from various attitudes with the aeroplane in the clean configuration.

3.4.13 Exercise 11 B: Developed spins - entry and recovery

- (1) Long briefing
 - (a) The spin entry.
 - (b) Recognition and identification of spin direction.
 - (c) The spin recovery.
 - (d) Use of controls.
 - (e) Effects of power/flaps (flap restriction applicable to type).
 - (f) Effect of the C of G upon spinning characteristics.
 - (g) Spinning from various flight attitudes.
 - (h) Aeroplane limitations.
 - (i) Airmanship - safety checks.
 - (j) Common errors during recovery.
- (2) Air exercise
 - (a) Aeroplane limitations.

- (b) Airmanship.
- (c) Safety checks.
- (d) The spin entry.
- (e) Recognition and identification of the spin direction.
- (f) The spin recovery (reference to flight manual).
- (g) Use of controls.
- (h) Effects of power/flaps (restrictions applicable to aeroplane type).
- (i) Spinning and recovery from various flight attitudes.

3.4.14 Exercise 12: Take-off and climb to downwind position

- (1) Long briefing
 - (a) Handling - factors affecting the length of take-off run and initial climb.
 - (b) The correct lift off speed, use of elevators (safeguarding the nose wheel), rudder and power.
 - (c) Effect of wind (including crosswind component).
 - (d) Effect of flaps (including the decision to use and the amount permitted).
 - (e) Effect of ground surface and gradient upon the take-off run.
 - (f) Effect of mass, altitude and temperature on take-off and climb performance.
 - (g) Pre-take-off checks.
 - (h) Air traffic control procedure (before take-off).
 - (i) Drills, during and after take-off.
 - (j) Tail wheel considerations (as applicable).
 - (k) Short/soft field take-off considerations/procedures.
 - (l) Emergencies
 - (i) Aborted take-off.
 - (ii) Engine failure after take-off.
 - (iii) Airmanship and air traffic control procedures.
 - (iv) Common errors.
- (2) Air exercise
 - (a) Pre-take-off checks.
 - (b) Into wind take-off.

- (c) Safeguarding the nose wheel.
- (d) Crosswind take-off.
- (e) Drills during and after take-off.
- (f) Short take-off and soft field procedure/techniques (including performance calculations).
- (g) Airmanship.

3.4.15 Exercise 13: Circuit, approach and landing

- (1) Long briefing
 - (a) The downwind leg, base leg, approach - position and drills.
 - (b) Factors affecting the final approach and the landing run
 - (i) Effect of mass;
 - (ii) effects of altitude and temperature;
 - (iii) effect of wind;
 - (iv) effect of flap;
 - (v) the landing; and
 - (vi) effect of ground surface and gradient upon the landing run.
 - (c) Types of approach and landing:
 - (i) Powered;
 - (ii) crosswind;
 - (iii) flapless (at an appropriate stage of the course);
 - (iv) glide;
 - (v) short field; and
 - (vi) soft field.
 - (d) Tail wheel aeroplane considerations (as applicable).
 - (e) Missed approach.
 - (f) Engine handling.
 - (g) Wake turbulence awareness.
 - (h) Adverse weather conditions
 - (i) Windshear awareness;
 - (ii) microbursts; and
 - (iii) aquaplaning.
 - (i) Airmanship and air traffic control procedures.
 - (j) Mislanding/go around.
 - (k) Special emphasis on lookout.
 - (l) Common errors.

(2) Air exercise

- (a) Circuit Procedures - downwind, base leg.
- (b) Powered approach and landing.
- (c) Safeguarding the nose wheel.
- (d) Effect of wind on approach and touchdown speeds and use of flaps.
- (e) Crosswind approach and landing.
- (f) Glide Approach and landing.
- (g) Flapless approach and landing (short and soft field).
- (h) Wheel landing (tail wheel aircraft).
- (i) Missed approach/go around.
- (j) Mislanding/go around.

3.4.16 Exercise 14: First solo

(1) Long briefing

- (a) 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.

- (b) Procedures for leaving and rejoining the circuit.
- (c) The local area (restrictions and controlled airspace).
- (d) Compass turns.
- (e) QDM meaning and use.
- (f) Airmanship.
- (g) Common errors.

(2) Air exercise

- (a) During the flights immediately following the solo circuit consolidation period the following should be covered
 - (i) Procedures for leaving and rejoining the circuit;
 - (ii) the local area (restrictions and controlled airspace);
 - (iii) compass turns;
 - (iv) obtaining QDM; and
 - (v) airmanship.

3.4.17 Exercise 15: Advanced turning

(1) Long briefing

- (a) The forces.
- (b) Use of power.
- (c) Effect of load factor
 - (i) Structural considerations;
 - (ii) increased stalling speed; and
 - (iii) physiological effects.
- (d) Rate and radius of turn.
- (e) Steep, level, descending and climbing turns.
- (f) Stalling in the turn
- (g) Unusual attitudes and recoveries.
 - (i) Spinning from the turn - recovery at the incipient stage; and
 - (ii) the spiral dive.
- (h) Airmanship.
- (i) Common errors.

Consideration must be given manoeuvre limitations, and reference to the owner's/flight manual/pilot's operating handbook must be made in relation to mass and balance, and any other restrictions for practice entries to the spin.

- (2) Air exercise
 - (a) Level, descending and climbing steep turns.
 - (b) Stalling in the turn.
 - (c) The spiral dive.
 - (d) Spinning from the turn.
 - (e) Recovery from unusual attitudes.
 - (f) Maximum rate turns.
 - (g) Airmanship.

3.4.18 Exercise 16: Forced landing without power

- (1) Long briefing
 - (a) Selection of forced landing areas.
 - (b) Provision for change of plan.
 - (c) Gliding distance - consideration.
 - (d) Planning the descent.
 - (e) Key positions.
 - (f) Engine failure checks.
 - (g) Use of radio - RTF "distress" procedure.

- (h) The base leg.
 - (i) The final approach.
 - (j) Go around.
 - (k) The landing considerations.
 - (l) Actions after landing - aeroplane security.
 - (m) Causes of engine failure.
 - (n) Airmanship.
 - (o) Common errors.
- (2) Air exercise
- (a) Forced landing procedures.
 - (b) Selection of landing area
 - (i) Provision for change of plan; and
 - (ii) gliding distance considerations.
 - (c) Planning the descent
 - (i) Key positions;
 - (ii) engine failure checks;
 - (iii) use of radio;
 - (iv) the base leg;
 - (v) the final approach; and
 - (vi) the landing.
 - (d) Actions after landing
 - (i) Aeroplane security.
 - (e) Airmanship.

3.4.19 Exercise 17: Precautionary landing with power

- (1) Long briefing
- (a) Occasions when necessary (in flight conditions)
 - (i) Field selection and communication (RTF procedure);
 - (ii) overhead inspection;
 - (iii) simulated approach; and
 - (iv) climb away.
 - (b) Landing at a normal aerodrome.
 - (c) Landing at a disused aerodrome.
 - (d) Landing on an ordinary field.
 - (e) Circuit and approach.
 - (f) Actions after landing - aeroplane security.
 - (g) Airmanship.
 - (h) Common errors.

(2) Air exercise

- (a) Occasions when necessary (in flight conditions)
 - (i) Field selection;
 - (ii) overhead inspection;
 - (iii) .approach; and
 - (iv) simulated climb away.
- (b) Landing at a normal aerodrome.
- (c) Landing at a disused aerodrome.
- (d) Landing on an ordinary field.
- (e) Circuit and approach.
- (f) Actions after landing - aeroplane security.
- (g) Airmanship.

3.4.20 Exercise 18A: Pilot navigation

(1) Long briefing

- (a) Flight planning
 - (i) Weather forecast and actual(s).
 - (ii) Map selection and preparation.
 - (iii) Choice of route.
 - (iv) Regulated/controlled airspace.
 - (v) Danger, prohibited and restricted areas.
 - (vi) Safety altitude.
 - (vii) Calculations
 - (viii) Magnetic heading(s) and time(s) en route;
 - (ix) fuel consumption;
 - (x) mass and balance; and
 - (xi) mass and performance.
- (b) Flight information
 - (i) NOTAMS etc.;
 - (ii) noting of required radio frequencies; and
 - (iii) selection of alternate aerodrome.
 - (iv) Aircraft documentation.
 - (v) Notification of the flight
 - (vi) Booking out procedure; and
 - (vii) flight plans.
- (c) Aerodrome departure
 - (i) Organisation of flight deck workload.
 - (ii) Departure procedures
 - (iii) Altimeter settings;
 - (iv) setting heading procedures; and
 - (v) Noting of ETA(s).
- (d) En route
 - (i) Map reading -identification of ground features.

- (ii) Maintenance of altitudes and headings.
- (iii) Revisions to ETA and heading, wind effect, drift angle and groundspeed checks.
- (iv) Log keeping.
- (v) Use of radio (including VDF if applicable).
- (vi) Minimum weather conditions for continuance of flight.
- (vii) "In flight" decisions, diversion procedures.
- (viii) Operations in regulated/controlled airspace.
- (ix) Procedures for entry, transit and departure.
- (x) Navigation at minimum level.
- (xi) Uncertainty of position procedure including RTF procedure.
- (xii) Lost procedure.
- (xiii) Use of radio navigation aids.
- (xiv) Arrival procedures.
- (xv) Aerodrome circuit joining procedures
 - Altimeter setting, ATC Liaison, RTF procedure;
 - entering the traffic pattern (controlled/uncontrolled aerodromes).
- (xvi) Circuit procedures.
- (xvii) Parking procedures.
- (xviii) Security of aeroplane refuelling and booking in.

(2) Air exercise

- (a) Flight planning
- (b) Weather forecast and actual(s).
 - (i) Map selection and preparation.
 - (ii) Choice of route.
 - (iii) Regulated/controlled airspace.
 - (iv) Danger, prohibited and restricted areas.
 - (v) Safety altitude.
 - (vi) Calculations
 - Magnetic heading(s) and time(s) en route;
 - fuel consumption;
 - mass and balance; and
 - mass and performance.
 - (viii) Flight information
 - NOTAMS etc.;
 - noting of required radio frequencies; and
 - selection of alternate aerodromes.
 - (ix) Aeroplane documentation.
 - (x) Notification of the flight
 - Booking out procedure; and
 - flight plans.
- (c) Aerodrome departure
 - (i) Organisation of flight deck workload.
 - (ii) Departure procedures
 - (iii) Altimeter settings;
- (d) En route
 - (i) Noting of ETA(s).

- (ii) Wind effect, drift angle, ground speed checks.
- (iii) Maintenance of altitudes and headings.
- (iv) Revisions to ETA and heading.
- (v) Log keeping.
- (vi) Use of radio (including VDF if applicable).
- (vii) Minimum weather conditions for continuance of flight.
- (viii) "In flight" decisions.
- (ix) Diversion procedure.
- (x) Operations in regulated/controlled airspace.
- (xi) Procedures for entry, transit and departure.
- (xii) Navigation at minimum level.
- (xiii) Uncertainty of position procedure.
- (xiv) Lost procedure.
- (xv) Use of radio nav aids.
- (xvi) Arrival procedures.
- (xvii) Aerodrome joining procedures
 - Altimeter setting, ATC liaison; and
 - entering the traffic pattern.
- (xviii) Circuit procedures.
- (xix) Parking procedures.
- (xx) Security of aeroplane.
- (xxi) Refueling.
- (xxii) Booking in.

3.4.21 Exercise 18B: Operation at minimum level

- (1) Long briefing
 - (a) General considerations
 - (i) Planning requirements prior to flight in entry/exit lanes.
 - (ii) ATC rules, pilot qualifications and aircraft equipment.
 - (iii) Entry/exit lanes and areas where specific local rules apply.
 - (b) Low level familiarisation
 - (i) Actions prior to descending.
 - (ii) Visual impressions and height keeping at low altitude.
 - (iii) Effects of speed and inertia during turns.
 - (iv) Effects of wind and turbulence.
 - (c) Low level operation
 - (i) Weather considerations.
 - (ii) Low cloud and good visibility.
 - (iii) Low cloud and poor visibility.
 - (iv) Avoidance of moderate to heavy rain showers.
 - (v) Effects of precipitation.
 - (vi) Joining a circuit.
 - (vii) Bad weather circuit, approach and landing.

- (viii) Airmanship.
- (2) Air exercise
 - (a) Low level familiarisation
 - (i) Entry/exit lanes and areas where specific local rules apply.
 - (ii) Actions prior to descending.
 - (iii) Visual impressions and height keeping at low altitude.
 - (iv) Effects of speed and inertia during turns.
 - (v) Effects of wind and turbulence.
 - (b) Low level operation
 - (i) Weather considerations.
 - (ii) Low cloud and good visibility.
 - (iii) Low cloud and poor visibility.
 - (iv) Avoidance of moderate to heavy rain showers.
 - (v) Effects of precipitation (forward visibility).
 - (vi) Joining a circuit.
 - (vii) Bad weather circuit, approach and landing.
 - (viii) Airmanship.

3.4.22 Exercise 19 : Introduction to instrument flying

- (1) Long briefing
 - (a) Objectives
 - (i) flight instruments.
 - (ii) physiological considerations.
 - (iii) instrument appreciation
 - (iv) attitude instrument flight;
 - (v) pitch indications;
 - (vi) bank indications;
 - (vii) different dial presentations;
 - (viii) introduction to the use of the attitude indicator;
 - (ix) pitch attitude;
 - (x) bank attitude;
 - (xi) maintenance of heading and balanced flight;
 - (xii) instrument limitations (inc system failures).
 - (b) Attitude, power and performance
 - (i) attitude instrument flight
 - (ii) control instruments;
 - (iii) performance instruments;
 - (iv) effect of changing power and configuration;
 - (v) cross checking the instrument indications;
 - (vi) instrument interpretation;
 - (vii) direct and indirect indications (performance instruments);
 - (viii) instrument lag;
 - (ix) selective radial scan.
 - (c) The basic flight manoeuvres (full panel)

- (i) straight and level flight at various airspeeds and aeroplane configurations.
 - (ii) climbing.
 - (iii) descending.
 - (iv) standard rate turns - onto pre-selected headings.
 - (v) level - onto pre-selected headings.
 - (vi) climbing - onto pre-selected headings.
 - (vii) Descending - onto pre-selected headings.
- (2) Air exercise
 - (a) General
 - (i) Physiological sensations.
 - (ii) Instrument appreciation.
 - (iii) Attitude instrument flight.
 - (iv) Pitch attitude.
 - (v) Bank attitude.
 - (vi) Maintenance of heading and balanced flight.
 - (vii) Attitude instrument flight.
 - (viii) Effect of changing power and configuration.
 - (ix) Cross checking the instruments.
 - (x) Selective radial scan.
 - (b) The basic flight manoeuvres (full panel)
 - (i) Straight and level flight at various airspeeds and aeroplane configurations.
 - (ii) Climbing.
 - (iii) Descending.
 - (iv) Standard rate turns - onto pre-selected headings.
 - (v) Level - onto pre-selected headings.
 - (vi) Climbing - onto pre-selected headings.
 - (vii) Descending - onto pre-selected headings.

3.4.23 Exercise 20 : Night flying

- (1) Long briefing
 - (a) Objectives
 - (i) Taxiing the aircraft safely at night.
 - (ii) Using the correct combination of instrument and visual flight at night.
 - (iii) Take-off and landing at night.
 - (iv) Navigation at night.
 - (b) Flight information
 - (i) NOTAM
 - (ii) AIC.
 - (iii) AIP.
 - (iv) Weather.
 - (v) Flight Plans.
 - (vi) Navigation Aids.
 - (vii) Charts.
 - (c) Flight planning

- (i) Fuel requirements.
 - (ii) Minimum safe altitudes.
 - (iii) Selection of alternates.
 - (iv) Radio frequencies.
 - (v) Maps and charts.
 - (vi) Flight logs.
- (d) Aircraft Documentation.
- (e) Basic night flying techniques.
- (f) Aircraft and airfield lighting.
- (g) Use of navigation aids.
- (h) Approach aids.
- (i) Physiological effects - night vision, optical illusions, disorientation.
- (j) Procedures - start, taxi, take-off, joining the circuit, approach and landings.
- (k) Safety.
- (l) Emergencies
 - (i) Loss of electrical power;
 - (ii) lost procedure; and
 - (iii) landing without the landing light.
- (m) Airmanship.

61.23.3 THEORETICAL KNOWLEDGE EXAMINATION (GR 3 INSTRUCTOR - A)

1. Examination

An applicant for the issuing of a Grade III aeroplane flight instructor rating must pass a written examination on -

- (1) theory of flight;
- (2) principles of flying instruction;
- (3) navigation and meteorology;
- (4) the MOZ-CAR relating to the licensing requirements applicable to all pilot licenses and ratings;
- (5) theory of high-altitude flight;
- (6) the application of aero-medicine to high-altitude flying; and
- (7) human factors (teaching and learning).

2. Conducting of theoretical knowledge examinations

The written theoretical knowledge examination is conducted by the Director General.

3. Duties of Director General

- (1) The Director General must publish in an AIC
 - (a) the dates on which examinations are to be written;
 - (b) the latest date by which applications for each such examination are to reach the Director General;
 - (c) the format and duration of each examination; and
 - (d) the fees payable for such examinations.
- (2) The entry fee paid for any examination may, upon request by the candidate, be refunded or transferred to a subsequent examination: Provided that an acceptable reason for such request is furnished.

4. Admission to examinations

Admission to a written theoretical examination is subject to the following conditions:

- (1) An application for admission to the examination must be made on the relevant application form;
- (2) the application must be accompanied by the fee prescribed in Part 187 of the MOZ-CAR;

- (3) the application and fee must be submitted to the Director General to reach the Director General's office on or before the closing date published for such examination;
- (4) the rules and instructions determined by the Director General for such examination, must be complied with, which rules and instructions must be supplied to a candidate upon his or her admission for a particular examination; and
- (5) a candidate must subject himself or herself to disqualification from future examinations for a period not exceeding 12 months if the rules and instructions referred to in subparagraph (4) are contravened and the candidate will be deemed to have failed the examination in which such contravention occurred.

5. Remarking of examination scripts

- (1) A candidate who has failed one or more examination papers with a mark between 66% and 69%, may, on payment of the fee prescribed in Part 187 of the MOZ-CAR, apply for the remarking of the script or scripts concerned.
- (2) Application for the remarking of an examination script or scripts must be made in writing to the Director General and such application, accompanied by the fee, must reach the Director General not later than one month after the examination results were published.
- (3) The decision of the Director General on any remarked examination script, is final.

61.23.4 SKILL TEST (GR 3 INSTRUCTOR - A)

1. Procedures and manoeuvres

An applicant for the issuing of a Grade III aeroplane flight instructor rating must demonstrate the following procedures and manoeuvres:

(1) Theoretical oral

Only two of the following subjects are to be selected.

- (a) Air law.
- (b) Aircraft general knowledge.
- (c) Flight performance and planning.
- (d) Human performance and limitations.
- (e) Meteorology.
- (f) Navigation.
- (g) Operational procedures.
- (h) Principles of flight.
- (i) Training administration.

(2) Selected main exercise - pre-flight briefing

- (a) Visual presentation.
- (b) Technical accuracy.
- (c) Clarity of explanation.
- (d) Clarity of speech.
- (e) Instructional technique.
- (f) Use of models and aids.
- (g) Student participation.

(3) Selected main exercise - flight

- (a) Arrangement of demonstration.
- (b) Synchronisation of patter with demo.
- (c) Correction of faults.
- (d) Aircraft handling/accuracy of flight.
- (e) Instructional technique.
- (f) Safety considerations.
- (g) ATC procedures and liaison.

(4) Other exercises

At least 4 of the following exercises must be given.

- (a) Primary effects of controls.
- (b) Secondary effects of controls.
- (c) Stalling (various configurations).
- (d) Spinning (where applicable).
- (e) Forced landing.
- (f) Take-off and landing.
- (g) Climbing and descending.

(5) Abnormal and emergency procedures

The applicant is expected to indicate the actions to be taken and carry out touch drills but is not expected to perform any operating action. This section may be combined with other sections.

- (a) Engine fire during start and in the air.
- (b) Alternate landing gear extension.
- (c) Electrical failure.
- (d) Brake failure.
- (e) Smoke or fire in the cabin.
- (f) Trim system problems.
- (g) Radio failure.
- (h) Other (state).

(6) General

- (a) Decision making ability.
- (b) Overall safety considerations.
- (c) General smoothness and co-ordination.
- (d) Ability to plan ahead.
- (e) Overall impression.

2. Conducting the skill test

- (1) The skill test must be conducted by a designated examiner.
- (2) The skill test must be preceded by an oral examination on, but not limited to -
 - (a) normal, abnormal and emergency procedures;
 - (b) limitations;
 - (c) systems knowledge; and

(d) the applicable Air Law, where appropriate.

3. Skill test report

(1) Completion

The designated examiner conducting the skill test, must complete the skill test report contained in form MZ 61-34.

(2) Assessment

All the procedures and manoeuvres must be assessed as prescribed in the test form.

4. Retesting after failure

An applicant who has failed two consecutive skill tests, must undergo the appropriate training at an aviation training organisation approved in terms of Part 141, after which the applicant may be retested upon the production of a training certificate issued by such aviation training organisation.

61.23.5 APPLICATION FOR GRADE 3 INSTRUCTOR RATING -AEROPLANES

1. Form of application

The application form for the issuing of an instructor rating, is contained in form MZ 61-08, which is available from the Director General.

2. Skill test report

The skill test report that must accompany an application for the issuing of an instructor rating, is contained in form MZ 61-34, which is available from the Director General.

3. Form of temporary instructor rating certificate

A temporary instructor rating certificate is issued on the form contained in the license.

61.23.6 ISSUING OF GRADE 3 INSTRUCTOR RATING -AEROPLANES

1. Form of rating

A Grade 3 instructor rating is issued on the form determined by the Director General.

61.23.7 PRIVILEGES AND LIMITATIONS (GR 3 INSTRUCTOR – A)

1. Multi-engine training

The Grade III Flight Instructor may only provide training in multi-engine aeroplanes if:

- (1) he/she is the holder of a multi-engine type and class rating; or
- (2) he/she has passed the multi-engine type rating training course, theoretical knowledge examination and practical skill test prescribed under Subpart 19 and has made application for his multi-engine type and class rating; and
- (3) he/she has been issued with a temporary multi-engine type rating.

2. Multi-engine instructor skill test

The multi-engine type rating skill test required to be passed by the Grade III Flight Instructor is the skill test referred to in regulation 61.19.04.

61.23.9 RENEWAL (GR 3 INSTRUCTOR - A)

1. Proficiency check

The proficiency check required for the renewal of an instructor rating, is the skill test referred to in CATS 61.23.5.

2. Proficiency check report

The proficiency check report that must accompany an application for the renewal of an instructor rating, is contained in form MZ 61-34, which is available from the Director General.

3. Form of application

The application form for the renewal of an instructor rating, is contained in form MZ 61-08, which is available from the Director General.

4. Form of temporary instructor rating certificate

A temporary instructor rating certificate is issued on the form contained in the license.

5. Form of renewal

An instructor rating is renewed on the form determined by the Director General.

61.23.10 REISSUE (GR 3 INSTRUCTOR - A)

1. Skill test report

The skill test report that must accompany an application for the reissuing of an instructor rating, is contained in form MZ 61-34, which is available from the Director General.

2. Form of application

The application form for the reissuing of an instructor rating, is contained in form MZ 61-08, which is available from the Director General.

3. Form of reissue

An instructor rating is reissued on the form determined by the Director General.

4. Form of temporary instructor rating certificate

A temporary instructor rating certificate is issued on the form contained in the license.

61.25.5 SKILL TEST (GR 1 INSTRUCTOR - H)

1. Procedures and manoeuvres

An applicant for the issuing of a Grade I helicopter flight instructor rating must demonstrate the following procedures and manoeuvres:

(1) Theoretical oral

Only two of the following subjects are to be selected.

- (a) Air law.
- (b) Aircraft general knowledge.
- (c) Flight performance and planning.
- (d) Human performance and limitations.
- (e) Meteorology.
- (f) Navigation.
- (g) Operational procedures.
- (h) Principles of flight.
- (i) Training administration.

(2) Selected main exercise - pre-flight briefing

- (a) Visual presentation.
- (b) Technical accuracy.
- (c) Clarity of explanation.
- (d) Clarity of speech.
- (e) Instructional technique.
- (f) Use of models and aids.
- (g) Student participation.

(3) Selected main exercise - flight

- (a) Arrangement of demonstration.
- (b) Synchronisation of patter with demo.
- (c) Correction of faults.
- (d) Aircraft handling/accuracy of flight.
- (e) Instructional technique.
- (f) Safety Considerations.
- (g) ATC, procedures and liaison.

(4) Other exercises

- (a) Primary effects of controls.
- (b) Secondary effects of controls.
- (c) Forced landing (autorotation)
- (d) Take-off and landing.
- (e) Climbing and descending.

(5) Multi-engine flight (if applicable)

- (a) Simulated engine failure during take-off.
- (b) Simulated engine failure during approach.
- (c) Engine failure procedures.
- (d) Safety considerations.
- (e) ATC procedures.

(6) Abnormal and emergency procedures

The applicant is expected to indicate the actions to be taken and carry out touch drills but is not expected to perform any operating action. This section may be combined with other sections.

- (a) Engine fire during start and in the air.
- (b) Alternate landing gear extension (if applicable).
- (c) Electrical failure.
- (d) Smoke or fire in the cabin.
- (e) Trim system problems.
- (f) Radio failure.
- (g) Other (state).

(7) General

- (a) Decision making ability.
- (b) Overall safety considerations.
- (c) General smoothness and coordination.
- (d) Ability to plan ahead.
- (e) Overall impression.

2. Conducting the skill test

The skill test must be conducted by a designated examiner.

3. Skill test report

(1) Completion

The designated examiner conducting the skill test, must complete the skill test report contained in form MZ 61-32.

(2) Assessment

All the procedures and manoeuvres must be assessed as prescribed on the test form.

61.25.6 APPLICATION FOR GRADE 1 INSTRUCTOR RATING - HELICOPTERS

1. Form of application

The application form for the issuing of an instructor rating, is contained in form MZ 61-08, which is available from the Director General.

2. Skill test report

The skill test report that must accompany an application for the issuing of an instructor rating, is contained in form MZ 61-32, which is available from the Director General.

3. Form of temporary instructor rating certificate

A temporary instructor rating certificate is issued on the form contained in the license.

61.25.7 ISSUING OF GRADE 1 INSTRUCTOR RATING - HELICOPTERS

1. Form of rating

A Grade 1 instructor rating is issued on the form determined by the Director General.

61.25.10 RENEWAL (GR 1 INSTRUCTOR - H)

1. Proficiency check

The proficiency check required for the renewal of an instructor rating, is the skill test referred to in CATS 61.25.5.

2. Proficiency check report

The proficiency check report that must accompany an application for the renewal of an instructor rating, is contained in form MZ 61-32 which is available from the Director General.

3. Form of application

The application form for the renewal of an instructor rating, is contained in form MZ 61-08, which is available from the Director General.

4. Form of temporary instructor rating certificate

A temporary instructor rating certificate is issued on the form contained in the license.

5. Form of renewal

An instructor rating is renewed on the form determined by the Director General.

61.25.11 REISSUE (GR 1 INSTRUCTOR - H)

1. Skill test report

The skill test report that must accompany an application for the reissuing of an instructor rating, is contained in form MZ 61-32, which is available from the Director General.

2. Form of application

The application form for the reissuing of an instructor rating, is contained in form MZ 61-08, which is available from the Director General.

3. Form of reissue

An instructor rating is reissued on the form determined by the Director General.

4. Form of temporary instructor rating certificate

A temporary instructor rating certificate is issued on the form contained in the license.

61.26.3 TRAINING (GR 2 INSTRUCTOR - H)

1. Theoretical knowledge training requirements

The training referred to in TS 63.27.3 constitutes the training requirements for this technical standard.

The training course must cover the whole Flight Instructor Grade III syllabus in detail, but with specific attention to the assessment of student performance in the ground and flight training.

2. Practical training requirements

The following general outline will provide the guidelines to be followed in preparing the Grade III flight instructor for a Grade II skill test.

(1) Ground Briefing Procedures

Review the candidate's training file and ensure that all deficiencies have been dealt with. Select 4 long briefings at random and ensure that the applicant is fully competent at delivering the briefings to the standard required of a grade II instructor. This means that he or she is able to deliver the briefing logically and fluently in the required format and is able to correctly field the student pilot's questions without fumbling for the answers.

(2) In-flight Procedures

The applicant should undergo at least 3 one hour long sessions with the Chief Flying instructor or his/her designate focussing on the standard of patter being delivered and the applicant's ability to recognise problem areas and provide the necessary corrective patter to the standard required of a grade II instructor. The standard required of a Grade II instructor is that the patter and demonstrations are smoothly co-ordinated, the instructor does not fumble for words and is able to demonstrate and talk at the required pace. The applicant should be consistently using the correct terminology with there being no doubt about what is being referred to or being taught in each lesson. The sessions should include day, night and, in the case of aeroplanes, instrument flying training.

(3) Debriefing Procedures

The applicant for a Grade II instructor rating should be thoroughly acquainted with and skilled in debriefing or facilitating a review of the trainee pilot's performance.

(4) General

The applicant for a Grade II instructor rating should have a good knowledge of safety and the functioning of the Part 141 approved training organisations. safety system; how accident prevention programmes work; and understand the regulatory environment applicable to flight training. Prior to the practical

skill test the applicant for a grade II instructor rating will be required to answer oral questions on the following subjects -

- (a) Air Law;
- (b) Aircraft General Knowledge;
- (c) Flt Performance & Planning;
- (d) Human Performance & Limitations;
- (e) Meteorology;
- (f) Navigation;
- (g) Operational Procedures;
- (h) Principles of Flight; and
- (i) Training Administration.

61.26.4 THEORETICAL KNOWLEDGE EXAMINATION (GR 2 INSTRUCTOR - H)

1. Requirements

An applicant for the issuing of a Grade II helicopter flight instructor rating must comply with the following theoretical knowledge requirements:

- (1) The Grade II instructor must pass a classroom observation/assessment by a Grade I Flight Instructor in a topic assigned by the Instructor, demonstrating his ability to transfer his knowledge to the student(s), and
- (2) The Grade II instructor must demonstrate his knowledge regarding the assessment of student performance in the ground and flight training.

61.26.5 SKILL TEST (GR 2 INSTRUCTOR - H)

1. Procedures and manoeuvres

An applicant for the issuing of a Grade II helicopter flight instructor rating must demonstrate the following procedures and manoeuvres:

(1) Theoretical oral

Only two of the following subjects are to be selected

- (a) Air law.
- (b) Aircraft general knowledge.
- (c) Flight performance and planning.
- (d) Human performance and limitations.
- (e) Meteorology.
- (f) Navigation.
- (g) Operational procedures.
- (h) Principles of flight.
- (i) Training administration.

(2) Selected main exercise - pre-flight briefing

- (a) Visual presentation.
- (b) Technical accuracy.
- (c) Clarity of explanation.
- (d) Clarity of speech.
- (e) Instructional technique.
- (f) Use of models and aids.
- (g) Student participation.

(3) Selected main exercise - flight

- (a) Arrangement of demonstration.
- (b) Synchronisation of patter with demo.
- (c) Correction of faults.
- (d) Aircraft handling/accuracy of flight.
- (e) Instructional technique.
- (f) Safety considerations.
- (g) ATC procedures and liaison.

- (4) Other exercises
 - (a) Primary effects of controls.
 - (b) Secondary effects of controls.
 - (c) Forced landing.
 - (d) Take-off and landing.
 - (e) Climbing and descending.
- (5) Multi-engine flight (if applicable)
 - (a) Simulated engine failure during take-off.
 - (b) Simulated engine failure during approach.
 - (c) Engine failure procedures.
 - (d) Safety considerations.
 - (e) ATC procedures.
- (6) Instrument exercises
 - (a) Basic attitude flying.
 - (b) Interception of bearings to and from NDB.
 - (c) Interception of VOR radials.
 - (d) Non-precision approach demonstration.
 - (e) Precision approach demonstration.

(7) Abnormal and emergency procedures

The applicant is expected to indicate the actions to be taken and carry out touch drills but is not expected to perform any operating action. This section may be combined with other sections.

- (a) Engine fire during start and in the air.
 - (b) Alternate landing gear extension.
 - (c) Electrical failure.
 - (d) Brake failure.
 - (e) Smoke or fire in the cabin.
 - (f) Trim system problems.
 - (g) Radio failure. Other (state).
- (8) General
 - (a) Decision making ability.
 - (b) Overall safety considerations.

- (c) General smoothness and co-ordination.
- (d) Ability to plan ahead.
- (e) Overall impression.

2. Conducting the skill test

The skill test must be conducted by a designated examiner.

3. Skill test report

(1) Completion

The designated examiner conducting the skill test, must complete the skill test report contained in form MZ 61-32.

(2) Assessment

All the procedures and manoeuvres must be assessed as prescribed on the test form.

61.26.6 APPLICATION FOR GRADE 2 INSTRUCTOR RATING - HELICOPTERS

1. Form of application

The application form for the issuing of an instructor rating, is contained in form MZ 61-08, which is available from the Director General.

2. Skill test report

The skill test report that must accompany an application for the issuing of an instructor rating, is contained in form MZ 61-32, which is available from the Director General.

3. Form of temporary instructor rating certificate

A temporary instructor rating certificate is issued on the form contained in the license.

61.26.7 ISSUING OF GRADE 2 INSTRUCTOR RATING - HELICOPTERS

1. Form of rating

A Grade 2 instructor rating is issued on the form determined by the Director General.

61.26.9 PRIVILEGES (GR 2 INSTRUCTOR – H)

1. Multi-engine training

The Grade II Flight Instructor may only provide training in multi-engine or multi-rotor helicopters if:

- (1) he/she is the holder of a multi-engine (or multi-rotor) type and class rating; or
- (2) he/she has passed the multi-engine (or multi-rotor) type rating training course, theoretical knowledge examination and practical skill test prescribed under Subpart 19 and has made application for his multi-engine (or multi-rotor) type and class rating; and
- (3) he/she has been issued with a temporary multi-engine (or multi-rotor) type rating.

2. Multi-engine instructor skill test

The multi-engine type rating skill test required to be passed by the Grade II Flight Instructor is the skill test referred to in regulation 61.19.04.

61.26.10 Renewal (GR 2 INSTRUCTOR – H)

1. Proficiency check

The proficiency check required for the renewal of an instructor rating, is the skill test referred to in CATS 61.26.5.

2. Proficiency check report

The proficiency check report that must accompany an application for the renewal of an instructor rating, is contained in form MZ 61-32, which is available from the Director General.

3. Form of application

The application form for the renewal of an instructor rating, is contained in form MZ 61-08, which is available from the Director General.

4. Form of temporary instructor rating certificate

A temporary instructor rating certificate is issued on the form contained in the license.

5. Form of renewal

An instructor rating is renewed on the form determined by the Director General.

61.26.11 REISSUE (GR 2 INSTRUCTOR - H)

1. Skill test report

The skill test report that must accompany an application for the reissuing of an instructor rating, is contained in form MZ 61-32, which is available from the Director General.

2. Form of application

The application form for the reissuing of an instructor rating, is contained in form MZ 61-08, which is available from the Director General.

3. Form of reissue

An instructor rating is reissued on the form determined by the Director General.

4. Form of temporary instructor rating certificate

A temporary instructor rating certificate is issued on the form contained in the license.

61.27.2 TRAINING (GR 3 INSTRUCTOR - H)

1. Aim of training course**1.1 General**

- (1) The course is designed to give the applicant adequate training in ground and flying instructional techniques based upon established teaching methods.
- (2) On successful completion of the course and final test, the applicant will be issued with a Grade III flight instructor (helicopter) rating permitting the holder to give ground and flight training appropriate to the issuing of a private pilot license (helicopter) or a commercial pilot license (helicopter).
- (3) The flight instructor course should stress 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 maturity and judgement including an understanding of adults, their behavioural attitudes and variable levels of education.
- (4) With the exception of paragraph 2 below, all the subject detail contained in the ground and flight training syllabus is complementary to the commercial pilot (helicopter) course syllabus and should already be known by the applicant. The purpose of the course is to -
 - (a) refresh and bring up to date 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 private pilot level.
- (5) During the course, the applicant should be made aware of his or her own attitudes to the importance of flight safety. The flight instructor is the critical link in the flight training process and his or her attitude to flight safety has a major impact upon student pilots, improving safety awareness should therefore 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 and to achieve this the course curriculum, in terms of goals and objectives, should comprise at least the items contained in paragraphs 2 and 3 below.

1.2 Ground training

The ground training consists of all instruction given on the ground for the purpose of the course and includes classroom lectures, tutorials, long briefings and directed private study, but excludes pre-flight briefings and post-flight discussions which form part of the flight training.

1.3 Flight training

The student instructor must occupy for at least 20 hours in total, the seat normally occupied by the flight instructor, except when acting as a student pilot on mutual flights.

2. Teaching and learning

2.1 The learning process

- (1) Motivation.
- (2) Perception and understanding.
- (3) Memory and its application.
- (4) Habits and transfer.
- (5) Obstacles to learning.
- (6) Incentives to learning.
- (7) Learning methods.
- (8) Rates of learning.

2.2 The teaching process

- (1) Elements of effective teaching.
- (2) Planning of instructional activity.
- (3) Teaching methods.
- (4) Teaching from the "known" to the "unknown".
- (5) Use of "lesson plans".

2.3 Training philosophies

- (1) Value of a 'structured (approved) course of training.
- (2) Importance of a planned syllabus.
- (3) Integration of ground and flight training.

2.4 Techniques of applied instruction

- (1) GROUND - Classroom instruction techniques
 - (a) Use of training aids.
 - (b) Group lectures.

- (c) Individual briefings.
 - (d) Student participation/discussion.
-
- (2) FLIGHT - Airborne instruction techniques
 - (a) The cockpit environment.
 - (b) Techniques of applied instruction.
 - (c) Post flight and in-flight judgement and decision making.

2.5 Student evaluation and testing

- (1) Assessment of student performance
 - (a) The function of progress tests.
 - (b) Recall of knowledge.
 - (c) Translation of knowledge into understanding.
 - (d) Development of understanding into actions.
 - (e) The need to evaluate rate of progress.
- (2) Analysis of student errors
 - (a) Establish the reason for errors.
 - (b) Tackle major faults first, minor faults second.
 - (c) Avoidance of over criticism.
 - (d) The need for clear concise communication.

2.6 Training programme development

- (1) Lesson planning.
- (2) Preparation.
- (3) Explanation and demonstration.
- (4) Student participation and practice.
- (5) Evaluation.

2.7 Human performance and limitations relevant to flight instruction

- (1) Physiological factors.
- (2) Psychological factors.
- (3) Human information processing.
- (4) Attitudes.
- (5) Development of judgement and decision making.

2.8 Hazards involved in simulating systems failures and malfunctions in the helicopter during flight

- (1) Selection of a safe altitude.
- (2) Importance of "touch drills".
- (3) Situational awareness.
- (4) Adherence to correct procedures.

2.9 Training administration

- (1) Flight/ground training records.
- (2) Pilot's personal flying log book.
- (3) The flight/ground curriculum.
- (4) Study material.
- (5) Official forms.
- (6) Aircraft flight/owner's manuals/pilot's operating handbooks.
- (7) Flight authorisation papers. .
- (8) Aircraft documents.
- (9) The private pilot license regulations.

3. Flight training syllabus contents

3.1 General

- (1) The briefing normally includes a statement of the aim and a brief allusion to principles of flight only if relevant. An explanation must be made 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.
- (2) The four basic components of the briefing will be -
 - (a) the aim;
 - (b) principles of flight (briefest reference only);
 - (c) the air exercise(s) (what, and how and by whom); and
 - (d) airmanship (weather and flight safety).

3.2 Planning of flight lessons

The preparation of lesson plans is an essential prerequisite of good instruction and the student instructor must be given supervised practice in the planning and practical application of flight lesson plans.

3.3 General considerations

- (1) The student instructor should complete flight training to practise the principles of basic instruction at the private pilot (helicopter) level.
- (2) During this training, except when acting as a student pilot for mutual flights, the student instructor must occupy the seat normally occupied by the flight instructor.
- (3) It is to be noted that airmanship is a vital ingredient of all flight operations. Therefore, in the air exercises the relevant aspects of airmanship must be stressed at the appropriate times during each flight.

3.4 Practical training course

The practical training course must cover the following:

- (1) Pre-flight operations, mass and balance determination, helicopter inspection and servicing;
- (2) aerodrome and traffic pattern operations, collision avoidance and procedures;
- (3) control of the helicopter by external visual reference;
- (4) take-offs, landings, hovering, look out turns and normal transitions from and to the hover;
- (5) emergency procedures, basic auto-rotations, simulated engine failure, ground resonance recovery if relevant to type;
- (6) sideways and backwards flight, turns on the spot;
- (7) incipient vortex ring recognition and recovery;
- (8) touchdown auto-rotations, engine-off landings, practice forced landings. Simulated equipment malfunctions and emergency procedures relating to malfunctions of engines, controls, electrical and hydraulic circuits;
- (9) steep turns;
- (10) precision transitions, quick stops, out of wind manoeuvres, sloping ground landings and take-offs;
- (11) limited power and confined area operations including low level operations to and from unprepared sites;
- (12) flight by sole reference to basic flight instruments, including completion of a 180° turn and recovery from unusual attitudes to simulated inadvertent entry into cloud;
- (13) cross-country flying by external visual reference, dead reckoning and radio navigation aids, diversion procedures;

- (14) aerodrome and traffic pattern operations at different aerodromes;
- (15) operations to, from and transiting controlled aerodromes; compliance with air traffic service procedures, radiotelephony procedures and phraseology; and
- (16) application of meteorological briefing arrangements, evaluation and weather conditions for flight and use of Aeronautical Information Services (AIS).

61.27.3 THEORETICAL KNOWLEDGE EXAMINATION (GR 3 INSTRUCTOR-H)

1. Examination

An applicant for the issuing of a Grade III helicopter instructor rating must pass a written examination on -

- (1) Air Law
- (2) theory of flight;
- (4) principles of flying instruction;
- (5) navigation and meteorology;
- (6) the MOZ-CAR relating to the licensing requirements applicable to all pilot licenses and ratings;
- (7) theory of high-altitude flight;
- (8) the application of aero-medicine to high-altitude flying; and
- (9) human factors (teaching and learning).

2. Conducting of theoretical knowledge examinations

The written theoretical knowledge examination is conducted by the Director General.

3. Duties of Director General

- (1) The Director General must publish in an AIC -
 - (a) the dates on which examinations are to be written;
 - (b) the latest date by which applications for each such examination are to reach the Director General;
 - (c) the format and duration of each examination; and
 - (d) the fees payable for such examinations.
- (2) The entry fee paid for any examination may, upon request by the candidate, be refunded or transferred to a subsequent examination: Provided that an acceptable reason for such request is furnished.

4. Admission to examinations

Admission to a written theoretical examination is subject to the following conditions:

- (1) An application for admission to the examination must be made on the relevant application form;
- (2) the application must be accompanied by the fee prescribed in Part 187 of the MOZ-CAR;

- (3) the application and fee must be submitted to the Director General to reach the Director General's office on or before the closing date published for such examination;
- (4) the rules and instructions determined by the Director General for such examination, must be complied with, which rules and instructions must be supplied to a candidate upon his or her admission for a particular examination; and
- (5) a candidate must subject himself or herself to disqualification from future examinations for a period not exceeding 12 months if the rules and instructions referred to in subparagraph (4) are contravened and the candidate will be deemed to have failed the examination in which such contravention occurred.

5. Remarking of examination scripts

- (1) A candidate who has failed one or more examination papers with a mark between 66% and 69%, may, on payment of the fee prescribed in Part 187 of the MOZ-CAR, apply for the remarking of the script or scripts concerned.
- (2) Application for the remarking of an examination script or scripts must be made in writing to the Director General and such application, accompanied by the fee, must reach the Director General not later than one month after the examination results were published.
- (3) The decision of the Director General, on any remarked examination script, is final.

61.27.4 SKILL TEST (GR 3 INSTRUCTOR - H)

1. Procedures and manoeuvres

An applicant for the issuing of a Grade III helicopter flight instructor rating must demonstrate the following procedures and manoeuvres:

(1) Theoretical oral

Only two of the following subjects are to be selected

- (a) Air law.
- (b) Aircraft general knowledge.
- (c) Flight performance and planning.
- (d) Human performance and limitations.
- (e) Meteorology.
- (f) Navigation.
- (g) Operational procedures.
- (h) Principles of flight.
- (i) Training administration.

(2) Selected main exercise - pre-flight briefing

- (a) Visual presentation.
- (b) Technical accuracy.
- (c) Clarity of explanation.
- (d) Clarity of speech.
- (e) Instructional technique.
- (f) Use of models and aids.
- (g) Student participation.

(3) Selected main exercise - flight

- (a) Arrangement of demonstration.
- (b) Synchronisation of patter with demo.
- (c) Correction of faults.
- (d) Aircraft handling/accuracy of flight.
- (e) Instructional technique.
- (f) Safety considerations.
- (g) ATC procedures and liaison.

(4) Other exercises

At least 4 of the following exercises must be given.

- (a) Primary effects of controls.
- (b) Secondary effects of controls.
- (c) Forced landing (autorotation).
- (d) Take-off and landing.
- (e) Climbing and descending.
- (f) Abnormal and emergency procedures

(5) The applicant is expected to indicate the actions to be taken and carry out touch. drills but is not expected to perform any operating action. This section may be combined with other sections.

- (a) Engine fire during start and in the air.
- (b) Alternate landing gear extension.
- (c) Electrical failure. .
- (d) Smoke or fire in the cabin.
- (e) Trim system problems.
- (f) Radio failure.
- (g) Other (state).

(6) General

- (a) Decision making ability.
- (b) Overall safety considerations.
- (c) General smoothness and co-ordination.
- (d) Ability to plan ahead.
- (e) Overall impression.

2. Conducting the skill test

- (1) The skill test must be conducted by a designated examiner.
- (2) The skill test must be preceded by an oral examination on, but not limited to -
 - (a) normal, abnormal and emergency procedures;
 - (b) limitations;
 - (c) systems knowledge; and
 - (d) the applicable Air Law, where appropriate.

3. Skill test report

(1) Completion

The designated examiner conducting the skill test, must complete the skill test report contained in form MZ 61-32, which is available from the Director General.

(2) Assessment

All the procedures and manoeuvres must be assessed as prescribed on the test form.

4. Retesting after failure

An applicant who has failed two consecutive skill tests, must undergo the appropriate training at an aviation training organisation approved in terms of Part 141, after which the applicant may be retested upon the production of a training certificate issued by such aviation training organisation.

61.27.5 APPLICATION FOR GRADE 3 INSTRUCTOR RATING – HELICOPTERS

1. Form of application

The application form for the issuing of an instructor rating, is contained in form MZ 61-08, which is available from the Director General.

2. Skill test report

The skill test report that must accompany an application for the issuing of an instructor rating, is contained in form MZ 61-32, which is available from the Director General.

3. Form of temporary instructor rating certificate

A temporary instructor rating certificate is issued on the form contained in the license.

61.27.6 ISSUING OF GRADE 3 INSTRUCTOR RATING – HELICOPTERS

1. Form of rating

A Grade 3 instructor rating is issued on the form determined by the Director General.

61.27.9 RENEWAL (GR 3 INSTRUCTOR - H)

1. Proficiency check

The proficiency check required for the renewal of an instructor rating, is the skill test referred to in CATS 61.27.5.

2. Proficiency check report

The proficiency check report that must accompany an application for the renewal of an instructor rating, is contained in form MZ 61-32, which is available from the Director General.

3. Form of application

The application form for the renewal of an instructor rating, is contained in form MZ 61-08, which is available from the Director General.

4. Form of temporary instructor rating certificate

A temporary instructor rating certificate is issued on the form contained in the license.

5. Form of renewal

An instructor rating is renewed on the form determined by the Director General.

61.27.10 REISSUE (GR 3 INSTRUCTOR - H)

1. Skill test report

The skill test report that must accompany an application for the reissuing of an instructor rating, is contained in form MZ 61-32, which is available from the Director General.

2. Form of application

The application form for the reissuing of an instructor rating, is contained in form MZ 61-08, which is available from the Director General.

3. Form of reissue

An instructor rating is reissued on the form determined by the Director General.

4. Form of temporary instructor rating certificate

A temporary instructor rating certificate is issued on the form contained in the license.

61.29.2 TRAINING (MPL INSTRUCTOR)

1. Aim of training course

The aim of the Microlight instructor rating training course is to train microlight instructors to the level of proficiency necessary to obtain the instructor rating to enable them to conduct theoretical and practical instruction for microlight pilots.

1.1 General

- (1) The course is designed to give the applicant adequate training in ground and flying instructional techniques based upon established teaching methods.
- (2) On successful completion of the course and final test, the applicant will be issued with a microlight instructor rating permitting the holder to give ground and flight training appropriate to the issuing of a microlight and commercial microlight pilot license.
- (3) The flight instructor course should stress 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 maturity and judgement including an understanding of adults, their behavioural attitudes and variable levels of education.
- (4) With the exception of paragraph 1.2 below, all the subject detail contained in the ground and flight training syllabus is complementary to the microlight pilot course syllabus and should already be known by the applicant. The purpose of the course is to -
 - (a) refresh and bring up to date 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 private pilot level.
- (5) During the course, the applicant should be made aware of his or her own attitudes to the importance of flight safety. The flight instructor is the critical link in the flight training process and his or her attitude to flight safety has a major impact upon student pilots, improving safety awareness should therefore 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 instructors task and to achieve this the course curriculum, in terms of goals and objectives, should comprise at least the items contained in paragraphs 1.2 and 1.3 below.

1.2 Ground training

The ground training consists of all instruction given on the ground for the purpose of the course and includes classroom lectures, tutorials, long briefings and directed private study, but excludes pre-flight briefings and post-flight discussions which form part of the flight training.

1.3 Flight training

The student instructor must occupy for at least 20 hours in total, the seat normally occupied by the flight instructor, except when acting as a student pilot on mutual flights.

1.4 Air exercises

- (1) The air exercises are similar to those used for the training of microlight pilots 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. 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:
 - (a) The applicant's progress and ability;
 - (b) the weather conditions affecting the flight;
 - (c) the flight time available;
 - (d) instructional technique considerations; and
 - (e) the local operating environment

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.

2. Teaching and learning

2.1 The learning process

- (1) Motivation.
- (2) Perception and understanding.
- (3) Memory and its application.
- (4) Habits and transfer.
- (5) Obstacles to learning.
- (6) Incentives to learning.
- (7) Learning methods.
- (8) Rates of learning.

2.2 The teaching process

- (1) Elements of effective teaching.
- (2) Planning of instructional activity:
- (3) Teaching methods.
- (4) Teaching from the "known" to the "unknown".
- (5) Use of "lesson plans".

2.3 Training philosophies

- (1) Value of a structured (approved) course of training.
- (2) Importance of a planned syllabus.
- (3) Integration of ground and flight training.

2.4 Techniques of applied instruction

- (1) GROUND - Classroom instruction techniques
 - (a) Use of training aids.
 - (b) Group lectures.
 - (c) Individual briefings.
 - (d) Student participation/discussion.
- (2) FLIGHT - Airborne instruction techniques
 - (a) The flight deck environment.
 - (b) Techniques of applied instruction.
 - (c) Post flight and in-flight judgement and decision making.

2.5 Student evaluation and testing

- (1) Assessment of student performance
 - (a) The function of progress tests.
 - (b) Recall of knowledge.
 - (c) Translation of knowledge into understanding.
 - (d) Development of understanding into actions.
 - (e) The need to evaluate rate of progress.
- (2) Analysis of student errors
 - (a) Establish the reason for errors.
 - (b) Tackle major faults first, minor faults second.

- (c) Avoidance of over criticism.
- (d) The need for clear concise communication.

2.6 Training programme development

- (1) Lesson planning.
- (2) Preparation.
- (3) Explanation and demonstration.
- (4) Student participation and practice.
- (5) Evaluation.

2.7 Human performance and limitations relevant to flight instruction

- (1) Physiological factors.
- (2) Psychological factors.
- (3) Human information processing.
- (4) Behavioural attitudes.
- (5) Development of judgement and decision making.

2.8 Hazards involved in simulating systems failures and malfunctions in the microlight aeroplane during flight

- (1) Selection of a safe altitude.
- (2) Importance of "touch drills".
- (3) Situational awareness.
- (4) Adherence to correct procedures.

2.9 Training administration

- (1) Flight/ground training records.
- (2) Pilot's personal flying log book.
- (3) The flight/ground curriculum.
- (4) Study material.
- (5) Official forms.
- (6) Aircraft flight/owner's manuals/pilot's operating handbooks.
- (7) Flight authorisation papers.
- (8) Aircraft documents.
- (9) The microlight pilot license regulations

3. Flight training syllabus contents

3.1 General

- (1) The briefing normally includes a statement of the aim and a brief allusion to principles of flight only if relevant. An explanation must be made 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.
- (2) The four basic components of the briefing will be -
 - (a) the aim;
 - (b) principles of flight (briefest reference only);
 - (c) the air exercise(s) (what, and how and by whom); and
 - (d) airmanship (weather and flight safety).
- (3) Stall/spin awareness and avoidance training consists of exercises 10A and 10B.

3.2 Planning of flight lessons

The preparation of lesson plans is an essential prerequisite of good instruction and the student instructor must be given supervised practice in the planning and practical application of flight lesson plans.

3.3 General considerations

- (1) The student instructor should complete flight training to practise the principles of basic instruction at the private pilot (aeroplane) level.
- (2) During this training, except when acting as a student pilot for mutual flights, the student instructor must occupy the seat normally occupied by the flight instructor.
- (3) It is to be noted that airmanship is a vital ingredient of all flight operations. Therefore, in the air exercises the relevant aspects of airmanship must be stressed at the appropriate times during each flight.

3.4 Long briefings and air exercises.

The long briefings and exercises that needs to be covered by the student instructor are those contained in the training syllabus for microlight and commercial microlight pilots in technical standard 61.10.3 and 61.11.3.

61.29.3 THEORETICAL KNOWLEDGE EXAMINATION (MPL INSTRUCTOR)

1. Examination

An applicant for the issuing of a microlight aeroplane instructor rating must pass a written examination on -

- (1) theory of flight;
- (2) principles of flying instruction;
- (3) navigation and meteorology;
- (4) the MOZ-CAR relating to the licensing requirements applicable to all pilot licenses and ratings;
- (5) theory of high-altitude flight;
- (6) the application of aero-medicine to high-altitude flying; and
- (7) human factors (teaching and learning).

2. Conducting of theoretical knowledge examinations

- (1) The written theoretical knowledge examination must be conducted by a microlight aeroplane flight instructor.
- (2) The flight instructor referred to in subparagraph (1), may not be the instructor from whom the applicant received his or her practical training.

3. Duties of Aviation Training Organisation

- (1) The aviation training organisation may publish -
 - (a) the dates on which examinations are to be written;
 - (b) the latest date by which applications for each such examination are to reach the aviation training organisation;
 - (c) the format and duration of each examination; and
 - (d) the fees payable for such examinations.
- (2) The entry fee paid for any examination may, upon request by the candidate, be refunded or transferred to a subsequent examination: Provided that an acceptable reason for such request is furnished.

4. Admission to examinations

Admission to a written theoretical examination is subject to the following conditions:

- (1) an application for admission to the examination must be made on the relevant application form;

- (2) the application must be accompanied by the entry fee;
- (3) the application and fee must be submitted to the aviation training organisation to reach its office on or before the closing date published for such examination;
- (4) the rules and instructions determined by the aviation training organisations for such examination, must be complied with, which rules and instructions must be supplied to a candidate upon his or her admission for a particular examination; and
- (5) a candidate must subject himself or herself to disqualification from future examinations for a period not exceeding 12 months if the rules and instructions referred to in subparagraph (4) are contravened and the candidate will be deemed to have failed the examination in which such contravention occurred.

5. Remarking of examination scripts

- (1) A candidate who has failed one or more examination papers with a mark between 66% and 69% may, on payment of the fee determined by the aviation training organisation, apply for the remarking of the script or scripts concerned.
- (2) Application for the remarking of an examination script or scripts must be made in writing to the aviation training organisation and such application, accompanied by the fee, must reach the aviation training organisation not later than one month after the examination results were published.
- (3) The decision of the aviation training organisation on any remarked examination script, is final.

61.29.4 SKILL TEST (MPL INSTRUCTOR)

1. Procedures and manoeuvres

An applicant for the issuing of a microlight aeroplane flight instructor rating must demonstrate skill in the following procedures and manoeuvres:

(1) Theoretical oral

Only two of the following subjects are to be selected.

- (a) Air law.
- (b) Aircraft general knowledge.
- (c) Flight performance and planning.
- (d) Human performance and limitations.
- (e) Meteorology.
- (f) Navigation.
- (g) Operational procedures.
- (h) Principles of flight.
- (i) Training administration.

(2) Selected main exercise - pre-flight briefing

- (a) Visual presentation.
- (b) Technical accuracy.
- (c) Clarity of explanation.
- (d) Clarity of speech.
- (e) Instructional technique.
- (f) Use of models and aids.
- (g) Student participation.

(3) Selected main exercise - flight

- (a) Arrangement of demonstration.
- (b) Synchronisation of patter with demo.
- (c) Correction of faults.
- (d) Aircraft handling/accuracy of flight.
- (e) Instructional technique.
- (f) Safety considerations.
- (g) ATC procedures and liaison.

(4) Other exercises

At least 4 of the following exercises must be given.

- (a) Primary effects of controls.
- (b) Secondary effects of controls.
- (c) Stalling (various configurations).
- (d) Spinning (where applicable).
- (e) Forced landing.
- (f) Take-off and landing.
- (g) Climbing and descending.

(5) Abnormal and emergency procedures

The applicant is expected to indicate the actions to be taken and carry out touch drills but is not expected to perform any operating action. This section may be combined with other sections.

- (a) Engine fire during start and in the air.
- (b) Alternate landing gear extension.
- (c) Electrical failure.
- (d) Brake failure.
- (e) Smoke or fire in the cabin.
- (f) Trim system problems.
- (g) Radio failure.
- (h) Other (state).

(6) General

- (a) Decision making ability.
- (b) Overall safety considerations.
- (c) General smoothness and co-ordination.
- (d) Ability to plan ahead.
- (e) Overall impression.

2. Conducting the skill test

- (1) The skill test must be conducted by a designated examiner.
- (2) The skill test must be preceded by an oral examination on, but not limited to
 - (a) normal, abnormal and emergency procedures;
 - (b) limitations;

- (c) systems knowledge; and
- (d) the applicable Air Law, where appropriate.

3. Skill test report

(1) Completion

The designated examiner conducting the skill test, must complete the skill test report contained in form MZ 61-34.

(2) Assessment

All the procedures and manoeuvres must be assessed as prescribed in the test form.

61.29.5 APPLICATION FOR MICROLIGHT INSTRUCTOR RATING

1. Form of application

The application form for the issuing of a microlight instructor rating, is contained in form MZ 61-08, which is available from the Director General.

2. Skill test report

The skill test report that must accompany an application for the issuing of a microlight instructor rating, is contained in form MZ 61-34, which is available from the Director General.

3. Form of temporary instructor rating certificate

A temporary microlight instructor rating certificate is issued on the form contained in the license.

61.29.6 ISSUING OF MICROLIGHT INSTRUCTOR RATING

1. Form of rating

A microlight instructor rating is issued on the form determined by the Director General.

61.29.9 RENEWAL (MPL INSTRUCTOR)

1. Proficiency check

The proficiency check required for the renewal of an instructor rating, is the skill test referred to in CATS 61.29.5.

2. Proficiency check report

The proficiency check report that must accompany an application for the renewal of an instructor rating, is contained in form MZ 61-34, which is available from the Director General.

3. Form of application

The application form for the renewal of an instructor rating, is contained in form MZ 61-08, which is available from the Director General.

4. Form of temporary instructor rating certificate

A temporary instructor rating certificate is issued on the form contained in the license.

5. Form of renewal

An instructor rating is renewed on the form determined by the Director General.

61.29.10 REISSUE (MPL INSTRUCTOR)

1. Skill test report

The skill test report that must accompany an application for the reissuing of an instructor rating, is contained in form MZ 61-34, which is available from the Director General.

2. Form of application

The application form for the reissuing of an instructor rating, is contained in form MZ 61-08, which is available from the Director General.

3. Form of reissue

An instructor rating is reissued on the form determined by the Director General.

4. Form of temporary instructor rating certificate

A temporary instructor rating certificate is issued on the form contained in the license.

61.30.3 APPLICATION FOR TUG PILOT RATING

1. Form of application

The application form for the issuing of a tug pilot rating, is contained in form MZ 61-10, which is available from the Director General.

2. Form of temporary tug pilot rating certificate

A temporary tug pilot rating certificate is issued on the form contained in the license.

61.30.4 ISSUING OF TUG PILOT RATING

1. Form of rating

A tug pilot rating is issued on the form determined by the Director General.

61.31.3 TRAINING (EXTERNAL LOAD)

1. Aim of training course

The aim of the training course is to train a candidate to the level of proficiency required for the issuing of an external-load rating (helicopter).

2. Contents and requirements of training course

The candidate must have completed not less than 100 hours of flight time as pilot-in-command of a helicopter.

The course comprises -

- (1) a theoretical knowledge course; and
- (2) a practical training course.

3. Theoretical knowledge course

The theoretical knowledge course comprises instruction on the following:

- (1) The significance of inside ground effect and outside ground effect operation and the correct use of the relevant performance charts;
- (2) the pre-flight checking and correct operation of the helicopter cargo hook equipment including the emergency release;
- (3) the importance of a full and correct briefing for all flight and ground crew members participating in the operation as regards -
 - (a) pick-up and drop-off points;
 - (b) load preparation and flight characteristics of different loads;
 - (c) the selection and correct use of lifting equipment, including strops of various lengths, swivels, shackles, nets, safety harness for cabin crew, as applicable;
 - (d) aircraft-generated static and the correct procedure in this regard;
 - (e) marshalling signals;
 - (f) correct radio procedures;
 - (g) hook-up and release procedures;
 - (h) safety and other equipment, including hand-held transceivers, hard hats, safety goggles, durable gloves, overalls and whistles;
 - (i) emergency procedures, including engine failure in the hover, straps getting fouled either with the helicopter or with other items, loads

becoming difficult or impossible to control in flight and jettisoning of loads; and

- (4) the pre-flight briefing which is given just before each flight, and consists of a brief summary of the principal parts of the theoretical knowledge course, together with any particular points of airmanship, air traffic control and meteorology pertaining to the flight.

4. Practical training course

4.1 In-flight instruction

A full briefing must be given during flight, covering the following:

- (1) Airmanship
 - (a) The suitability of pick-up and drop areas in respect of size and shape, approach and take-off paths and obstructions.
 - (b) Helicopter operation with due regard to such matters as power in the hover, power limitations, hovering into the wind, position of ground crew and obstructions.
 - (c) The limits for the relevant conditions.
 - (d) Good lookout at all times.
 - (e) Built-up areas and gatherings of people must be avoided at all cost when a load is suspended below the helicopter:
 - (f) Cabin crew, if used, must be safely secured to the helicopter by means of a safety harness.
- (2) Hook-up and transition
 - (a) Demonstrate the positioning of the helicopter accurately above the load using the techniques of marshalling either by radio, visual signals, and mirror or cabin crew intercom.

 Note: When a cabin crew member is used for marshalling, the pilot must strictly obey his or her instructions at all times, except if the helicopter and its occupants would be placed in jeopardy by doing so.
 - (b) Demonstrate the pick-up and the transition to forward flight when at a safe height.
 - (c) Demonstrate control of the load during flight and procedure to be followed if the load becomes difficult or impossible to control. For example, if the load starts oscillating, the pilot should reduce power and enter a gentle turn left or right, or bring the helicopter to a stationary hover, this will generally alleviate the condition. The load should only be jettisoned in extreme cases when the helicopter or its occupants are at risk and then only over uninhabited space.

- (3) Approach and drop-off
 - (a) The approach should be fairly shallow and cautious.
 - (b) The transition to the hover should be made high, to ensure adequate clearance between the load and the surface or ground obstacles.
 - (c) Control should be handed over to the cabin crew when still some distance short of the drop-off point.
 - (d) Demonstrate positioning the load over the drop-off point and lowering it to the surface or its position, using the techniques of marshalling either by radio, visual signals, and mirror or cabin crew intercom.
 - (e) Demonstrate releasing the load, using the normal release method and the emergency release method.
- (4) Common faults
 - (a) Lack of precision when hovering inside ground effect or outside ground effect.
 - (b) Lack of appreciation for ground clearance with a slung load.
 - (c) Vertical drift when lifting and lowering the load.
 - (d) Horizontal drift when lifting and lowering the load.
 - (e) Jerky pick-up and drop-off.
 - (f) Pilot-induced oscillations due to over-controlling on the cyclic.
 - (g) Trying to counter oscillations in flight using cyclic instead of power and speed.

4.2 Air exercises

- (1) Exercise 1 : Hook-up procedure
 - (a) Approach the hook-up area using -
 - (i) ground marshaller;
 - (ii) radio;
 - (iii) cabin crew intercom; and
 - (iv) helicopter mirror.
 - (b) Establish a steady inside ground effect or outside ground effect hover using –
 - (i) short strop;
 - (ii) long strop.

- (c) Once the load has been hooked up, take up the slack while monitoring the power required to hover before lifting the helicopter vertically until the load is well clear of the surface or obstacles, as communicated/established by each of the methods listed under paragraph (a) above.
 - (d) Once the load is clear, transit to forward flight.
- (2) Exercise 2 : In-flight
 - (a) Observe V_{ia} as established from the flight manual or dictated by the load, while handling the controls as smoothly as possible
 - (b) Reduce power and enter a gentle turn to either left or right, or bring the helicopter to a stationary hover, to demonstrate the technique for bringing an oscillating load under control.
 - (c) Avoid any built-up or inhabited areas during flight with a slung load.
- (3) Exercise 3 : Drop-off procedure
 - (a) Approach the drop-off area at a shallow angle using -
 - (i) ground marshaller;
 - (ii) radio;
 - (iii) cabin crew intercom; and
 - (iv) helicopter mirror.
 - (b) Terminate the approach in a high hover with the load well clear of the surface or ground obstacles as communicated/established by each of the methods listed under item (a) above.
 - (c) Maintain a steady inside ground effect or outside ground effect hover while monitoring the power required to hover.
 - (d) Position the load over the drop-off point.
 - (e) Once in position, lower the load vertically until it contacts the surface and then jettison it using –
 - (i) the normal release system; or
 - (ii) the emergency release system.

4.3 Post-flight discussion

The post-flight discussion reviews the exercise and can be used to amplify or clarify any particular point or difficulty, thus consolidating the exercise as a whole.

61.31.4 APPLICATION FOR EXTERNAL LOAD RATING

1. Form of application

The application form for the issuing of an external load rating, is contained in form MZ 61-10, which is available from the Director General.

2. Form of temporary external load rating certificate

A temporary external load rating certificate is issued on the form contained in the license.

61.31.5 ISSUING OF EXTERNAL LOAD RATING

1. Form of rating

An external load rating is issued on the form determined by the Director General.

61.32.3 SKILL TEST (AGRICULTURAL PILOT RATING)

1. Procedures and manoeuvres

An applicant for the issuing of an agricultural pilot rating must demonstrate the following procedures and manoeuvres:

- (1) In the case of aeroplanes -
 - (a) short field take-offs and landings;
 - (b) cross-wind and down-wind take-offs and landings;
 - (c) flight manoeuvres at minimum air-speed;
 - (d) accelerated stalls;
 - (e) maximum-rate turns;
 - (f) spin recoveries entered into inside of and from outside of turns;
 - (g) precision landings, normal, down-wind and cross-wind;
 - (h) exit from application area, turn around and re-entry to application area under various wind conditions;
 - (i) simulated application runs at appropriate heights;
 - (j) entry to and exit from application area over obstructions;
 - (k) avoidance of obstructions;
 - (l) emergency procedures; and
 - (m) take-offs and landings at maximum load for prevailing conditions.
- (2) in the case of helicopters -
 - (a) cross-wind and down-wind take-offs and landings;
 - (b) take-offs and landings at maximum load for prevailing conditions;
 - (c) hover flight under cross-wind and tail-wind conditions;
 - (d) low-speed down-wind flight with turns into wind and turns back to down-wind flight;
 - (e) maximum-rate turns;
 - (f) simulated application runs at appropriate heights;
 - (g) exit from application area, turn around and re-entry to application area under various wind conditions;
 - (h) entry to and exit from application area over obstructions;
 - (i) emergency quick-stops for low-level autorotation;
 - (j) avoidance of obstructions; and
 - (k) emergency procedures.

2. Conducting of skill test

- (1) The skill test must be conducted by a designated examiner.
- (2) All skill tests must be carried out in aircraft that are equipped with dispensing apparatus and that are certificated for agricultural operations.
- (3) The skill test must be preceded by an oral examination on, but not limited to -
 - (a) normal, abnormal and emergency procedures;
 - (b) limitations;
 - (c) systems knowledge; and
 - (d) the applicable Air Law, where appropriate.

3. Skill test report

- (1) Completion

The designated examiner conducting the skill test, must complete the skill test report contained in form MZ 61-38, which is available from the Director General.
- (2) Assessment

All the procedures and manoeuvres must be assessed as prescribed in the test form.

61.32.4 APPLICATION FOR AGRICULTURAL PILOT RATING

1. Form of application

The application form for the issuing of an agricultural pilot rating, is contained in form MZ 61-10, which is available from the Director General.

2. Skill test report

The skill test report that must accompany an application for the issuing of an agricultural pilot rating, is contained in form MZ 61-38, which is available from the Director General.

3. Form of temporary agricultural rating certificate

A temporary agricultural pilot rating certificate is issued on the form contained in the license.

61.32.5 ISSUING OF AGRICULTURAL PILOT RATING

1. Form of rating

An agricultural pilot rating is issued on the form determined by the Director General.

ANNEX A: ICAO LANGUAGE PROFICIENCY RATING SCALE**1.1 Expert, Extended and Operational Levels**

I-LTV	LEVEL	PRONUNCIATION <i>Assesses a dialect and/or accent intelligible to the aeronautical community.</i>	STRUCTURE <i>Relevant grammatical structures and sentence patterns are determined by language functions appropriate to the task.</i>	VOCABULARY	FLUENCY	COMPREHENSION	INTERACTIONS
	Expert 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 5	Pronunciation, stress, rhythm, and intonation, though influenced by the first language or regional variation, rarely interfere with ease of understanding.	Basic grammatical structures and sentence patterns are consistently well controlled. Complex structures are attempted but with errors which sometimes interfere with meaning.	Vocabulary range and accuracy are sufficient to communicate effectively on common, concrete, and work-related topics. Paraphrases consistently and successfully. Vocabulary is sometimes idiomatic.	Able to speak at length with relative ease on familiar topics but may not vary speech flow as a stylistic device. Can make use of appropriate discourse markers or connectors.	Comprehension is accurate on common, concrete, and work-related 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.	Responses are immediate, appropriate, and informative. Manages the speaker/listener relationship effectively.
	Operational 4	Pronunciation, stress, rhythm, and intonation are influenced by the first language or regional variation but only sometimes interfere with ease of understanding.	Basic grammatical structures and sentence patterns are used creatively and are usually well controlled. Errors may occur, particularly in unusual or unexpected circumstances, but rarely interfere with meaning.	Vocabulary range and accuracy are usually sufficient to communicate effectively on common, concrete, and work-related topics. Can often paraphrase successfully when lacking vocabulary in unusual or unexpected circumstances.	Produces stretches of language at an appropriate tempo. There may be occasional loss of fluency on transition from rehearsed or formulaic speech to spontaneous interaction, but this does not prevent effective communication. Can make limited use of discourse markers or connectors. Fillers are not distracting.	Comprehension is mostly accurate on common, concrete, and work-related topics when the accent or variety used is 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.	Responses are usually immediate, appropriate, and informative. Initiates and maintains exchanges even when dealing with an unexpected turn of events. Deals adequately with apparent misunderstandings by checking, confirming, or clarifying.
Levels 1, 2 and 3 are on subsequent page.							

1.2 Pre-operational, Elementary and Pre-elementary Levels

LEVEL	PRONUNCIATION <i>Assumes a dialect and/or accent intelligible to the aeronautical community.</i>	STRUCTURE <i>Relevant grammatical structures and sentence patterns are determined by language functions appropriate to the task.</i>	VOCABULARY	FLUENCY	COMPREHENSION	INTERACTIONS
<i>Levels 4, 5 and 6 are on preceding page.</i>						
Pre-operational 3	Pronunciation, stress, rhythm, and intonation are influenced by the first language or regional variation and frequently interfere with ease of understanding.	Basic grammatical structures and sentence patterns associated with predictable situations are not always well controlled. Errors frequently interfere with meaning.	Vocabulary range and accuracy are often sufficient to communicate on common, concrete, or work-related topics, but range is limited and the word choice often inappropriate. Is often unable to paraphrase successfully when lacking vocabulary.	Produces stretches of language, but phrasing and pausing are often inappropriate. Hesitations or slowness in language processing may prevent effective communication. Fillers are sometimes distracting.	Comprehension is often accurate on common, concrete, and work-related topics when the accent or variety used is sufficiently intelligible for an international community of users. May fail to understand a linguistic or situational complication or an unexpected turn of events.	Responses are sometimes immediate, appropriate, and informative. 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 2	Pronunciation, stress, rhythm, and intonation are heavily influenced by the first language or regional variation and usually interfere with ease of understanding.	Shows only limited control of a 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 fillers to search for expressions and to articulate less familiar words.	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.
Pre-elementary 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 of proficiency below the ICAO language proficiency requirement. Levels 5 and 6 describe Extended and Expert levels, at levels of proficiency more advanced than the minimum required Standard. As a whole, the scale will serve as benchmarks for training and testing, and in assisting candidates to attain the ICAO Operational Level (Level 4).

ANNEX B: LOGBOOK

Year 1991		Aircraft		Pilot or captain in command	Details of flight and remarks	Single engine aircraft				Multi-engine aircraft				Instrument flying			Flying as Instructor			
Date		Type	Registration			Day		Night		Day		Night								
Month						Dual (i)	Pilot (ii)	Dual (iii)	Pilot (iv)	Dual (v)	Pilot (vi)	Co- pilot (vii)	Dual (viii)	Pilot (ix)	Co- pilot (x)	Naviga- tional aids (xi)	Place (xii)	Time (xiii)	Day (xiv)	Night (xv)
					Totals brought forward 40,15	70,3	10,10	6,00	65,10	100,45	5,00	10,00	20,00			45,15	35,15	10,30		
JUNE	22	C550	C9-ABC	SELF	JS-DN-PE					3	2.38 (b)	COMPLIED WITH				45				
	SUMMARY OF HOURS FLOWN FOR PERIOD FROM TO											(signature)								
					PA 28-140 2,00	17,00	1,00	3,20									2,00	5,00	3,20	
					PA 30				1,00	12,5		2,05					6,00	2,05		
					BONANZA 35	10,15		3,20												
					TWIN BONANZA B 55				3,00	1,00										
					C150	17,00		3,15									15,00	2,00		
					C402				2,00	14,00		10,00								
					TOTALS 2,00	44,15	1,00	9,55	6,00	27,05		12,05					26,00	7,25		
	SIGNATURE OF PILOT																			
	NAME OF INSTRUCTOR-																			
	SIGNATURE OF INSTRUCTOR-																			
Grand total/Columns (i) to (xi)						Totals carried forward														
Hours Minutes						40,15	70,9	10,10	6,00	65,10	100,45	5,00	10,00	20,00				48,00	35,15	10,30
327	50					(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)	(xi)	(xii)	(xiii)	(xiv)	(xv)