



CIVIL AVIATION  
SAFETY AUTHORITY  
AUSTRALIA

**THE AUSTRALIAN  
AIR TRANSPORT PILOT LICENCE  
(HELICOPTER)  
EXAMINATION INFORMATION BOOK**

**VERSION 2.2 - JULY 2000**  
(incorporating Reading List V1.0 - January 1999)

## **EXPLANATORY NOTE ON VERSION 2.2**

Version 2.2 of this ATPL(H) Information Book continues to provide additional relevant details to Issue 3 of the Helicopter ATPL syllabus - January 1999, but updates its information and specimen questions to the standard of Version 2.3 of the S76 Performance & Operations Handbook which is effective from July 2000.

*Note on the S76 Performance & Operations Handbook:*

*Versions 2.2 of the S76 Performance & Operations Handbook (November 1999) contains the same technical standards as Versions 2.3, hence candidates and schools having the former need not buy the latter. However, those holding Version 2.1 (January 1999) and studying/teaching the ATPL(H) Flight Planning and Performance & Loading components of the syllabus are advised to update their Handbook to Version 2.3.*

The administrative areas of the Book have been updated too, and its format standardized with that of the Aeroplane ATPL Information Book was taken.

In the Navigation Appendix, the 'examination aircraft' has been clarified as NOT RVSM-approved, but 'permitted to operate in RVSM airspace' in accordance with conventional IFR cruising levels.

## CONTENTS

<b>PART I</b>	<b>General Advice to Candidates</b>	Page 3
<b>PART II</b>	<b>Examination Structure</b>	Page 6
<b>PART III</b>	<b>Administrative Information</b>	Page 9
	Appendix A - How to Apply for the ATPL Examination	Page 10
	Appendix B - Material Required for Examination	Page 12
	Appendix C - Conduct of Candidates for the Examination	Page 16
	Appendix D - When Answering the Questions	Page 19
	Appendix E - Sample of a Flight Crew Examination Answer Sheet	Page 20
<b>PART IV</b>	<b>Technical Information</b>	Page 21
	Appendix A - Abbreviations	Page 23
	Appendix B - Suggested List of Study References	Page 24
	Attachment to Appendix B (V1.0)	Page 26
	Appendix C - Flight Planning	Page 29
	Appendix D - Performance and Loading	Page 36
	Appendix E - Aerodynamics and Aircraft Systems	Page 39
	Appendix F - Navigation	Page 42
	Appendix G - Meteorology	Page 45
	Appendix H - Human Factors	Page 47
	Appendix I - Air Law	Page 49

## **PART I**

### **GENERAL ADVICE TO CANDIDATES**

#### **1 INTRODUCTION**

- 1.1 The Civil Aviation Safety Authority (CASA) is entrusted with the responsibility of ensuring Australian Air Transport Pilot (Helicopter) Licence [ATPL(H)] holders are properly qualified to uphold the high standards of safety due to the Australian travelling public.
- 1.2 As an ATPL(H) authorises the holder to act as pilot in command of complex, high capacity, multi-crew helicopter engaged in passenger carrying operations, it is essential that the holder has demonstrated that he/she has, amongst other requirements, the aeronautical knowledge to exercise this privilege. The ATPL(H) syllabus of training prescribes the necessary areas of knowledge, and the CASA examination is designed to ensure that an applicant for this licence has been trained to the syllabus, and has attained the required standard for safe operations.

#### **2 COMMITMENT**

- 2.1 Before deciding to attempt the examination for the ATPL(H), candidates should appreciate the importance of acquiring the aeronautical knowledge that will provide them with a sound foundation to successfully undertake endorsement training, and to safely operate rotary wing aircraft in regular public transport operations. Consequently, the course of study that candidates adopt will have a very important impact on the standard of their aeronautical knowledge.
- 2.2 Candidates must bear in mind that the ATPL(H) examination is set to a standard based on their undergoing a properly structured course of adequate duration, with appropriate study material, and under qualified instruction and supervision. Such courses are available, and may be by classroom attendance at training institutions, or by distance learning. CASA is of the view that the average candidate would need a minimum ten to fifteen weeks of full-time tuition or the equivalent of at least 350 hours of study, depending on the structure of the course, to fully cover the material contained in the ATPL(H) syllabus of training and to reach the standard necessary to pass the associated examination.
- 2.3 The time taken is not nearly as great as that required of other professional occupations involving such similarly great responsibility. CASA is absolutely committed to ensuring that a holder of the Australian ATPL(H) is amongst the most competently qualified in the international aviation industry.

### 3 SELECTING A COURSE

- 3.1 Intending candidates should be aware that, unlike *flying* training schools, *aeronautical knowledge* training organizations are not legally required to be licensed, hence CASA does **not** regulate or supervise them. Therefore it would be prudent for candidates to carry out very careful assessment of these aeronautical knowledge training organizations (or instructors) before selecting one to conduct the training.
- 3.2 CASA promulgates a syllabus for every flight crew licence or rating, and in the case of the ATPL(H), an accompanying Information Book as well. The syllabus is the determinant of topic areas by which candidates would have to study to; how well a course subscribes to the syllabus will serve as an primary indicator of its standard and quality.
- 3.3 CASA recommends that candidates check the following when selecting a course:

- First and foremost, obtain the relevant syllabus, and familiarise themselves with it; have a general idea of the scope and depth of the knowledge required of a licence holder. The associated Information Book will also provide additional important details.

Unless candidates have a good idea of what will be involved in the study, they will not be aware of what an ATPL course should properly teach, and therefore not know whether they are receiving value-for-money for their course fees. Candidates attending a course that do not teach correctly to the syllabus will face difficulties in passing the examination.

- Check whether the training organization being considered offers a structured study plan, that ***covers the syllabus*** in an ***adequate period of time*** (or, if only a few selected subjects are being contemplated for study, the relevant portions of the syllabus).

The phrase "structured study plan" means that the course is so constructed that it will enable the average candidate to acquire/assimilate the required knowledge, and to the required standard, in a logical 'step-by-step' method.

Common sense will tell that the duration of the course must enable adequate coverage of the syllabus (or where applicable, the relevant portions) in a manner that permits the knowledge to be assimilated comprehensively, and to the required standard. As mentioned earlier, for the average student, this will be about ten to fifteen weeks of full-time tuition or the equivalent of 350 hours of study for all the subjects.

Courses that promote short cut methods only enable memorization of the provided materials, but not real acquisition of the aeronautical knowledge required of an ATPL holder.

- Check the progress and evaluation system the training organization uses to assess the student's readiness to sit the examination.

Is this designed to regularly assess the student's progress in the structured course so that appropriate *remedial* training may be programmed to ensure the student acquires the required knowledge? This would be one of the indicators of a well structured course.

Or, does it merely consist of exposing the student to imitations of CASA's examinations for the purpose of 'recognizing' questions and associating these with 'prepared' answers'? This method does not prepare the students to acquire the aeronautical knowledge demanded of an ATPL pilot, but merely to memorize/recognize certain items.

- Avoid those training organizations (or instructors) that make promises which appear not to require the candidate to study.
- Assess the aviation and teaching experience of the instructors - do they have the operational background and qualifications to deliver worthwhile instructions?
- Check that the instructor or training organization is registered with CASA

The phrase "registered with CASA" does *not* mean that the organization is approved by CASA. As a reminder, CASA does *not* regulate nor supervise aeronautical knowledge training organizations (or instructors).

What it means is that the organization is voluntarily listed with CASA, so that they may receive essential updates on flight crew training and examination matters, as well as the important feedback on their students' performances. Thus, a registered training organization is more likely to have up-to-date information to assist the students than would a non-registered organization.

- Ask/shop around, but do not base a decision solely on cost or convenience.
- Finally, if you are a working person and unable to afford time off to do a full time course covering all the 7 subjects, it will be more practical to attempt the ATPL examination subject by subject, or a manageable number of such subjects. CASA has designed the system for working people to achieve incremental accumulation of subject passes towards a full ATPL credit within a period of 3 years.

There are distance learning courses for those who wish to study without taking leave from their occupations. This situation is no different from other professions who achieve their degrees or diplomas through this method.

- 3.4 Candidates will not only derive the best value for their money with a well structured course, but also enjoy a better prospect of passing the examination.

## PART II

### EXAMINATION STRUCTURE

#### 1 INTRODUCTION

- 1.1 This Book aims to assist candidates in their preparation for the Australian ATPL(H) examination by providing relevant basic information.
- 1.2 The examination tests items of the ATPL (Helicopter) Aeronautical Knowledge Syllabus Issue 3 - January 1999.

#### 2 EXAMINATION STRUCTURE

- 2.1 The ATPL(H) examination consists of a seven separate subject-parts (hereafter called *Parts*), that may be attempted singly or in any number at a sitting. All seven Parts will be held at any one sitting over a period of three days.
- 2.1.1 Overseas candidates sitting the ATPL(H) under the approved arrangements of their respective national aviation regulatory Authority, which has examination agreements with CASA, are only required to sit for six Parts of this examination, minus the Australian Air Law Part. Under this system the Australian ATPL(H) examination credit will not be issued for the successful candidate. Instead the results will be forwarded to the respective national authority for its own processing, after the candidate has passed the Air Law paper for the country's ATPL(H)
- 2.2 The structure of the examination is as follows:

DAY	EXAM PAPER	SUBJECT PARTS	TIME ALLOWED	CODE
1 - AM	1	FLIGHT PLANNING	3.0 HOURS	AFPH
1 - PM	2	NAVIGATION	1.5 HOURS	ANAV
2 - AM	3	PERFORMANCE & LOADING	2.5 HOURS	APLH
2 - PM	4	AERODYNAMICS & AIRCRAFT SYSTEMS	2.5 HOURS	AASH
3 - AM	5	HUMAN FACTORS	1.0 HOUR	AHUF
3 - AM	6	METEOROLOGY	1.5 HOURS	AMET
3 - PM	7	AIR LAW	1.5 HOURS	AALW

*AM* = morning; *PM* = afternoon

### 3 EXAMINATION QUESTIONS

- 3.1 **Multi-Choice Format** - Examination questions are in multi-choice format, the number of alternative answers varying from three to a maximum of five. The candidate is to select the correct or nearest correct answer for the question asked, and denote this selection on the Answer Sheet provided. Instructions for filling in the Answer Sheet are available on the Answer Sheet itself.
- 3.2 **'Stand Alone'** - All questions are 'stand alone'; that is, they are not linked to one another and therefore will neither affect nor be dependent upon the answers of other questions.
- 3.3 **Marks** - Each question carries an amount of mark(s) to be awarded for its successful solution. In some Parts, the questions may each be allocated different mark(s). The amount awarded to the individual question will be based on the degree of complexity (time involved in answering it), and may range from 1 to 5. This allocation will be denoted against the individual question. The candidate is advised to take note of the marks allocated to each question.
- 3.4 **Total Marks Per Examination Part** - The total number of marks each examination Part carries will be the same for every candidate at the same sitting. However, the importance of ensuring that both the relevancy and quality of the examination do not diminished in the face of known accident and incident trends, emerging aviation technology and/or new operational practices, the examination structure and content will be reviewed regularly. This may result in a new Part content, with a revised total amount of marks for that Part.
- 3.5 **Number of Questions Per Examination Paper**- For a Part containing multi-marks questions, the total number of questions each examination paper contains may vary from another paper, as determined by the value of the individual marks of the constituent questions.
- 3.6 **Working Calculations and Assessment** - While working calculations in some questions may be necessary, these are not assessed. The scoring of the attempt is based solely on the selection of correct answers. Therefore a candidate should exercise the utmost care when entering the preferred answers on the Answer Sheet.
- 3.7 **Re-Assessment** - All workings are destroyed shortly after the examination. In the event of an application for a re-assessment, a review of the associated workings will not constitute part of the process. The sole criterion for deciding whether a question has been answered correctly or not is by determining what has been selected on the Answer Sheet.
- 3.8 **Removal of Questions from a Paper** - The Authority reserves the right to strike out any questions from any examination Part it sets, where there are valid reasons for doing so.

- 3.9 **Adjusted Score** - When a question is deleted from an examination Part, its marks are neither awarded nor subtracted from a candidate's overall result. The total possible score is reduced by the number of marks associated with the deleted question. However, the total time allocated for the Part remains unchanged.

#### 4 **MINIMUM STANDARD**

- 4.1 To obtain a Pass in the ATPL(H) examination the candidate must attain the following requirements:

- achieve '**not less than 70%**' of the total possible marks that may be obtained from each Part, with the exception of the Air Law paper (see following sub-paragraph).
- achieve '**not less than 80%**' of the total possible marks in the Air Law Part

#### 5 **AWARD OF THE ATPL(H) EXAMINATION CREDIT**

- 5.1 **Time-Limited Credit For Examination Parts** - An examination part, once passed, may be held in credit for a defined period of time. All seven examination parts must be passed within three calendar years, starting from the *first* attempt, successful *or otherwise*, hence candidates are advised to prepare adequately before attempting the examination. If these Parts are not passed within this three year period, all credits are lost and the candidates will have to sit all Parts of the examination again.
- 5.2 **Air Law Part** - deleted.
- 5.3 **ATPL(H) Credit** - Once all seven parts are passed within the defined period, an Australian ATPL(H) credit will be awarded.

## **PART III**

### **ADMINISTRATIVE INFORMATION**

#### **1 INTRODUCTION**

- 1.1 An important factor in the successful and stress free sitting of an examination is a thorough understanding of the procedures and processes involved. Adherence to these procedures will ensure that CASA is aware of the candidate's requirements, and that the candidate in turn will know what to expect at the examination.
- 1.2 Part III details the administrative procedures to be followed to successfully apply for an examination sitting and offers advice about the material supplied with the examination, conduct to be followed during the examination and important guidance about question answering techniques.
- 1.3 The information is contained at Appendices A to E of this Part, and familiarity with it will provide the best opportunity for a successful examination result.

#### **2 EXAMINATION SCHEDULE AND APPLICATION TO SIT**

- 2.1 The times, dates of examination sittings and closing dates for applications to sit the ATPL(H) examination for the year are detailed on the CASA Flight Crew Licensing Web-site (<http://www.casa.gov.au>), or may be obtained from CASA District Offices.
- 2.2 Examination application forms may be obtained from CASA District Offices or the Examination and Data Administration Section in Canberra.
  - 2.2.1 CASA recommends that the submission of an examination application is not left until the 'last minute', as postal delays may result in the application arriving after the closing date. A late application will not be accepted for a particular sitting, but instead registered for the following one.
- 2.3 If a candidate is unsure of the administrative requirements of the examination process, he/she may obtain information and advice from the ATPL Examination Administrator, by telephoning 131-757.

## HOW TO APPLY TO SIT THE ATPL EXAMINATION

### 1 APPLICATION

1.1 Obtain an application form for the ATPL Examination from:

- a registered theory training provider
- the local District Office, or
- Examination and Data Administration Section  
Personnel Licensing Branch  
Civil Aviation Safety Authority Australia  
PO Box 2005  
Canberra City ACT 2601, or
- the ATPL Examination Administrator by telephoning 131-757

1.2.1 Complete and lodge the application form in person at any CASA district office by close of business on the published closing day, **OR** post the application form to reach the following address by last mail on the published closing date:

Flight Crew Examinations  
Civil Aviation Safety Authority Australia  
PO Box 2005  
Canberra City ACT 2601

1.2.2 Alternatively, lodge application by facsimile (02) 6217 1683 / (02) 6217 1684.

1.3.1 **Ensure** application form is accompanied by the scheduled fee. Civil Aviation (Fees) Regulations apply. An application received without payment will **NOT** be processed, but returned to the candidate

1.3.2 When lodging an application by mail do **NOT** send cash. Make payment by credit card (VISA, MASTER CARD, BANK CARD), or cheque or money order.

1.4 Ensure application form is correctly completed. An incomplete application requires follow-up by CASA, and may **NOT** be processed in time for the desired sitting. Late applications will **NOT** be accepted for a particular sitting under any circumstances. Applications received after the closing date will be registered for the next available sitting.

## **2 AFTER THE APPLICATION**

- 2.1 Expect a letter of confirmation before the examination date. This letter will confirm the subjects to be attempted, the date and time of the examination, the examination venue and a list of any permitted documents.
- 2.2 Be aware that once an application has been accepted and the closing date has passed, the nominated examination Part or the examination centre cannot be changed.

## **3 CANCELLATION AND DEFERMENT OF APPLICATION**

- 3.1 To cancel their examination, this can be done at anytime *up to* the closing date. Notify the ATPL Examination Administrator by post at the same address, or by facsimile or phone number as for the application.
  - 3.1.2 Request for a deferment will be treated as a cancellation.
- 3.2 After the closing date, examination cancellations may only be granted without a forfeiture of the examination fee if a valid reason is provided with appropriate documentation. The documentation required shall be a doctor's certificate (if ill), or a letter from an employer (if recalled to work).
  - 3.2.1 The examination fee will be held in credit, and a credit letter issued to the candidate. When applying for a new examination, send this **original** credit letter. Photocopies will **NOT** be accepted.
- 3.3 Failure to turn up for an examination without a valid reason and the supporting documentation will result in the forfeiture of the examination fee. A complete re-application to sit an examination again will be necessary.

## **4 EXAMINATION COST**

- 4.1 Flight crew examination costs are under review, and changes may be expected. It is advisable to check the current cost with CASA offices, the ATPL Examination Administrator or from the CASA Flight Crew Licensing Web-site.
- 4.2 The cost is inclusive of the invigilation fees.

**APPENDIX B TO PART III****MATERIAL REQUIRED FOR EXAMINATION****1 TO BE SUPPLIED BY CASA**

- 1.1 Apart from the examination paper, Answer Sheet and scribble pad, some examination Parts may be supplied with supporting material. The following paragraphs list the standard materials provided with the respective Parts.
- 1.1.1 Where *additional* materials are provided, these will be listed in the examination papers.
- 1.2 **Part 1 (Flight Planning)**
- Sikorsky S76 Performance and Operations Handbook
  - An electronic calculator with basic functions
  - Appropriate navigational charts
- 1.3 **Part 2 (Navigation)**
- An electronic calculator with basic functions
- 1.4 **Part 3 (Performance & Loading)**
- Sikorsky S76 Performance and Operations Handbook
  - An electronic calculator with basic functions
- 1.5 **Part 4 (Aerodynamics & Aircraft Systems) - None provided**
- 1.6 **Part 5 (Human Factors) - None provided**
- 1.7 **Part 6 (Meteorology) - ATPL Work Book**
- 1.8 **Part 7 (Air Law) - None provided**
- 1.9 **ATPL WORK BOOKS** - This Book contains examination information or examination data that may be required by candidates for answering certain questions. The inclusion of such information in the Work Book does not signify that its usage in the examination is always necessary, save where directly specified in questions. Candidates must assess whether the use of the data may be appropriate.

## 1.10 Navigation Charts

1.10.1 **Australian Sittings** - Charts provided for the Flight Planning examination will generally consist of ERC Low. These charts are principally for extraction of route details. Examination questions are based on the supplied charts, thus the validity dates (currency) of these documents are not crucial to the solution of questions.

1.10.2 **Overseas Sittings** - This applies to overseas candidates sitting the Australian ATPL(H) Examination under the approved arrangements of their national aviation regulatory Authority. Either Australian charts as stated above or other charts may be provided, in accordance with agreement between the Authorities.

## 2 TO BE SUPPLIED BY CANDIDATES

2.1 Candidates are to provide their own writing implements. Normal pens, pencils and erasers are permitted.

2.2 Additionally, candidates shall supply certain materials for some examination Parts, as the answering of some examination questions may require their use. These 'permitted materials' are listed in paragraphs 2.4 to 2.13.

2.3 **AIP** refers to the Aeronautical Information Publication Australia published by Airservices Australia (sometimes referred to as CASA documents). The term '**AIP Complete**' includes *all* the following documents:

- ◆ AIP Book, including AIP SUP
- ◆ En Route Supplement Australia (ERSA) complete
- ◆ Departure and Approach Procedures (DAP) East and West
- ◆ Terminal Area Charts (TAC) (all)
- ◆ En Route Charts (ERC) Low & High (all)
- ◆ Planning Chart (AUS PCA)

2.3.1 The designation '**AIP Book**' in the above paragraph, 1st bullet point, refers **ONLY** to the AIP textbook containing Part 1 - GENERAL (GEN), Part 2 - ENROUTE (ENR), and Part 3 - AERODROMES (AD), but does **NOT** include documents listed in the other bullet points.

2.3.2 Where AIP documents in its 'completeness', as per paragraph 2.3, are deemed *not* necessary, then the required individual documents will be nominated specifically.

## 2.4 Part 1 (Flight Planning)

- Civil Aviation Orders (CAO) 20-95.2
- AIP *Book*
- Navigation equipment, which includes:
  - ◆ dividers
  - ◆ compass
  - ◆ protractor
  - ◆ ruler
  - non-electronic 'aviation wind triangle and circular slide rule' computer  
eg. *Jeppesen Sanderson CR or other brands of similar type, with a TMN/TAS conversion facility.*

### 2.4.1 Electronic flight planning/navigation computer is **NOT** permitted.

## 2.5 Part 2 (Navigation)

- AIP *Book*
- En Route Supplement Australia (ERSA) complete
- En Route Charts (ERC) Low (all)
- En Route Charts (ERC) High (all)
- Terminal Area Charts (TAC) (all)
- Planning Chart (AUS PCA)
- Navigation equipment as in Part 1

## 2.6 Part 3 (Performance & Loading)

- Navigation equipment as in Part 1

## 2.7 Part 4 (Aerodynamics & Aircraft Systems)

- Nil permitted

## 2.8 Part 5 (Human Factors)

- Nil permitted

## 2.9 Part 6 (Meteorology)

- AIP *Book*

## 2.10 **Part 7 (Air Law)**

- Civil Aviation Regulations (CAR)
- Civil Aviation Orders (CAO) 20-95.2
- Civil Aviation Advisory Publication (CAAP) 234-1(0)
- AIP complete

2.11 The candidate is responsible for ensuring all documents are up-to-date. Where reference to an Australian AIP document is made, this permits the alternative use of the Jeppesen equivalent document, should the candidate prefer the latter. This option for alternative usage **ONLY** applies to documents that are '*to be supplied by candidates*', and does **NOT** extend to material that will be '*supplied by CASA*'.

2.11.1 Candidates are advised that if any difference between the AIP and Jeppesen documents results in the selection of an incorrect answer, CASA will **NOT** accept this consequence as a basis for re-mark.

2.12 Other than the mentioned material for the respective examination Parts, **all other references and/or equipment are NOT permitted.**

2.13 Overseas candidates sitting under the approved arrangements of their national aviation regulatory Authority will be provided with the relevant AIP documents and sections.

## **3 LOCATION, CONDUCT AND SECURITY OF THE EXAMINATION**

### **3.1 Location**

3.1.1 **Australian Sittings** - The Australian ATPL(H) examination is available only in Australia for the Australian public. All examination sittings are conducted and invigilated by CASA officers/employees at official centres, which are listed on the CASA Flight Crew Licensing Web-site and published in the AIC.

3.1.2 **Overseas Sittings** - Overseas sittings are available only under special arrangements between the Australian CASA and overseas aviation regulatory Authorities, who use CASA examinations for their own licensing requirements. These sittings will be conducted and invigilated by Australian CASA officers.

### **3.2 Conduct and Security**

3.2.1 The integrity of the Australian ATPL examination is contingent upon its proper and fair conduct. In turn the quality of the conduct is to a large extent dependent upon good understanding of examination rules and procedures, and the correct behaviour of every candidate. Appendix C provides guidelines for good conduct, while Appendix D contains advice for the candidate on question answering techniques to help achieve a stress free sittings. Ultimately there is no substitute for the commonsense, decency and integrity of the individual.

## CONDUCT OF CANDIDATES FOR THE EXAMINATION

### 1 INTRODUCTION

- 1.1 **Role of the Invigilating Officer** - The Invigilating Officer's main role is to enable the examination to be conducted properly and fairly. He/she ensures that the relevant rules and procedures are complied with. He/she acts on behalf of CASA in assisting the candidate to resolve *administrative* problems that may arise immediately before and during the examination, and in recording observations and complaints made by the candidate.
- 1.1.1 **Authority of Invigilating Officer** - The candidate **MUST** comply with **ALL** instructions and orders issued by the Invigilating Officer.
- 1.1.2 **What the Invigilating Officer is NOT** - The Invigilating Officer is **NOT** an examiner nor an instructor. Therefore he/she is **NOT** permitted to discuss **NOR** interpret any aspects of a question, including any alleged error contained within the question; he/she may **NOT** provide any additional information, unless Flight Crew Licensing Section has directly authorised such an action; he/she may **NOT** assist in the working or calculation process.

### 2 PRE-EXAMINATION

- 2.1 **Proof of Identity** - Prior to sitting the examination the candidate must provide to the Invigilating Officer proof of identity. The **ONLY** acceptable form of identification is a *photographic* document, such as a driver's licence, passport, departmental or student card.
- 2.2 **Proof of Eligibility** - Prior to sitting the examination the candidate must produce for sighting by the Invigilating Officer a CASA result slip that he/she has passed the CASA Commercial Pilot Licence (Helicopter) examination. An Australian Commercial Pilot Licence (Helicopter) is adequate proof of eligibility.
- 2.3 **Answer Sheet** - The candidate must read and understand the instructions on the Answer Sheet and enter the required personal details correctly.
- 2.4 **Material Permitted** - Other than the material permitted for the respective examination Part, the candidate must not have at, or near, his/her sitting position personal items such as documents, files, bag, briefcase, coats etc. These items may be left at the front or rear of the examination room in accordance with the direction of the Invigilating Officer.

### 3 DURING THE EXAMINATION

- 3.1 **Seating** - During the examination the candidate must sit and remain seated at the position assigned by the Invigilating Officer.
- 3.2 **Timing** - The candidate must not open and read the examination papers until the Invigilating Officer gives the appropriate instructions to commence the examination. The time allowed for each examination Part includes 'reading' time. At the end of the time allowed the Invigilating Officer will give the instruction to "**stop writing**", and the candidate must comply promptly and put down his/her writing implements.
- 3.3 **Communication** - Silence shall be observed at all times, from the moment the candidate enters the examination room until he/she leaves the place on completion of the examination period. The candidate must **NOT** engage in any form of communication with anyone other than the Invigilating Officer.
- 3.3.1 The candidate shall address a query or report an alleged examination error **ONLY** to the Invigilating Officer, and in a quiet and non-disruptive manner; where possible, this should be done after the examination sitting is completed.
- 3.3 **Rights of Other Candidates** - Do respect the rights of other candidates. They are entitled to a quiet environment to sit the examination. The operative word is SILENCE. When a candidate has completed the examination, and has been allowed to leave the room, he/she should do so quietly.
- 3.3.1 A candidate who insists on disruptive behaviour to demonstrate a perceived dissatisfaction will be asked to leave the examination room immediately.
- 3.4 **Examination Material** - The examination paper and all materials provided are only for the sitting of the examination itself, and must **NOT** be copied or taken out of the examination room for any purpose. This rule covers all calculations, writings, drawings or scribbling done on working paper and/or the scribble pad.
- 3.4.1 **Unauthorised Reference Material** - With the exception of '*material to be supplied by the candidate*', unauthorised material must **NOT** be taken into the examination room, **NOR** should such material be referred to or used during the examination period, whether in or outside the examination room.
- 3.5 **Sharing of Materials** - Candidates are **NOT** permitted to share materials.
- 3.5.1 If a candidate does not have a required material, he/she shall inform the Invigilating Officer of the problem. The Invigilating Officer is **NOT** responsible for procuring material that should have been supplied by the candidate; however, the Invigilating Officer may volunteer to obtain the material, but this must **NOT** be from another candidate sitting the same examination. If the material is not available, the candidate is ultimately responsible for the deficiency.

- 3.6 **General Behaviour** - There shall be no eating, drinking, smoking, listening to any electronic devices, or engaging in improper activity during the examination.
- 3.7 **Proper Conduct** - Failure to comply with any of the above rules will disqualify the candidate from the sitting. The candidate may also be barred from any CASA examinations for 12 months.

#### 4 POST EXAMINATION

- 4.1 **Candidate Comment Sheet** - The candidate may, if he/she wishes, use this form to report any perceived technical errors in the examination papers, or dissatisfaction with the administration of the examination sitting. This should be carried out at the end of the examination period. The Invigilating Officer will allow 5 to 10 minutes for this activity. **NO DISCUSSION IS PERMITTED DURING THIS PERIOD** - the complainant may only report what he/she *personally* observed or experienced.

- 4.1.1 When making a report, the candidate should be as specific as possible with the comments. Relevant and objective details in the report will ensure an appropriate consideration by Flight Crew Licensing Section.
- 4.1.2 The following examples demonstrate what a typical report should contain:

*"Question 5 did not contain wind velocity data." or  
"ERC 1 was not provided."*

- 4.1.3 Flight Crew Licensing Section will not be able to provide the desired response to unhelpful comments, which do not provide specific details of the complaints, such as the following examples:

*"I think Question 5 was ambiguous." or  
"Your answers are all incorrect as they are different from mine."*

- 4.2 If there is no perceived error or ambiguity in the question, the candidate should **not** use the Comment Sheet to explain/justify his/her thought process or working calculations. These will not be assessed.
- 4.3 Comments containing abusive remarks and/or threats will be completely ignored.
- 4.4 Flight Crew Licensing Section will evaluate all comments that subscribe to the above guidelines, but is not in a position to contact individual candidates to provide a personalized feedback. Where candidates' comments are found valid, appropriate actions including the adjustments of marks will be carried out. Result Advice Slips are only issued after this process has been completed.

**APPENDIX D TO PART III****WHEN ANSWERING THE QUESTIONS**

- 1 The examination does not contain any trick question. Each statement means exactly what it says. Do not look for hidden meanings.
- 2 First, **read the question stem very carefully**, and where possible, preferably without looking at the alternative answers. Be sure that you understand what is asked of you.
- 3 Where required, select the relevant map, chart, diagram or document to support your workings. Where possible, without reference to the alternative answers, decide what the correct answer should be, or work out the problem to obtain the answer. Check your selection or calculations to ensure that you have answered the actual question - **NOT** what you **THINK** the question may be.
- 4 Look at the alternative answers and select the one that is the same as your answer. Only one alternative answer will be correct.
- 5 If you cannot find an alternative answer that matches your own answer, go back and **read the question again very carefully**. Make sure that you understand what is required, then re-check your calculations or document references.
- 6 It is **VERY** important that you register your answer choice in the **CORRECT** box on the answer sheet.
- 7 If you find that you have considerable difficulty with a particular question, do not spend too much time on it. Move on to the other questions and answer those of lesser difficulty. Then go back and reconsider the unanswered questions.
- 8 If you perceive what you consider as an error in a particular question, make a note to record this observation in the Candidate Comment Sheet after the examination period. If you are of the opinion that it cannot be answered, leave out the allegedly incorrect question. Otherwise, answer it with qualifications, which may be recorded in the Candidate Comment Sheet.
- 9 Remember, you are responsible for your own time management. Use the allocated time fruitfully to answer all or as many questions as possible. Do not waste time during the examination period on disruptive activities such as complaining to, or arguing with, the Invigilating Officer.



## PART IV

### TECHNICAL INFORMATION

#### 1 INTRODUCTION

- 1.1 The ATPL (Helicopter) Aeronautical Knowledge Syllabus is essentially a syllabus of training, while the ATPL(H) examination is a regulatory audit tool to assess whether such training has been completed and that the candidate meets the required standard. Hence the examination may test any item within that syllabus, **including** those carrying the annotation '*brief discussion only*'.

#### 2 COMMONALITY WITH ATPL (AEROPLANE) EXAMINATION

- 2.1 New technology has enable today's helicopters to operate in high altitude and high speed environments that hitherto have been monopolised by aeroplanes. CASA intends to ensure that the Helicopter ATPL remains relevant to the demands of this new operating envelope. Accordingly, it has identified areas of required training which are common with those for the Aeroplane ATPL, and reflected this commonality in the respective Aeronautical Knowledge Syllabi. This approach enables CASA to provide common examination papers for both Aeroplane and Helicopter for certain subject Parts.

#### 3 GENERAL

- 3.1 **Appendices** - The following appendices contain basic information on all the subject Parts, recommended reading list, standardised methods of calculations, commonly used abbreviations in the examination, and some specimen questions.
- 3.2 **Specimen Questions** - The specimen questions are representative of the style and layout that the candidate will see in the examination papers. These are provided to give the candidate an idea of what to expect, and not meant to be training exercises in themselves. Any such training should be from a proper course.
- 3.2.1 Specimen questions based on charts/documents are valid at time of writing. Subsequent chart/document changes may render these questions obsolete. However, this would not diminish their usefulness as specimen questions.
- 3.3 **Standardised Methods of Calculation** - The standardised methods of calculation for the relevant examination Parts cover rules of interpolation, 'rounding out' and other common assumptions. The objective is to ensure that numerical values derived by the candidate through correct techniques of calculation are similar, or reasonably close, to the values provided by the correct answer of the question.

- 3.4 **'Practical'** - The use of the word 'practical' to describe a question implies that it is one involving calculations, plotting and/or graphical work.
- 3.5 **Use of the 'Non-Electronic' Pilot Computer.** A competent standard is expected of the candidate in the use of a modern *non-electronic* 'aviation wind triangle and circular slide rule' pilot computer, including employment of its TMN/TAS conversion facility.

## APPENDIX A TO PART IV

### ABBREVIATIONS

The following abbreviations, besides than those listed in the AIP and examination documents, may be employed in the examination:

GW	gross weight
LW	landing weight
ZFW	zero fuel weight
MZW	mid zone weight
EMZW	estimated mid zone weight
TOW	takeoff weight
MTOW	maximum takeoff weight
CG	centre of gravity
OEI	one engine inoperative operations
CP (or ETP)	critical point (or equi-time point)
CP/OEI	one engine inoperative on and back
FBO	fuel burn off
FOB	fuel on board
PNR	point of no return
PNR/OEI	normal operations out and one engine inoperative back
PSD	point of safe diversion
PSD/OEI	normal operations out to the PSD and one engine inoperative operations from the PSD to an alternate aerodrome
SAR	specific air range
SGR	specific ground range
RTOD	rejected takeoff distance
CTOD	continued takeoff distance
PIC	pilot in command
CP	co-pilot
AICUS	(pilot) acting in command under supervision
FE	flight engineer
VR	variable reserve
FR	fixed reserve
kg	kilograms
lb	pounds
mm	millimetres
nm	nautical miles
pax	passengers
fpm	feet per minute
kts	knots

## APPENDIX B TO PART IV

### SUGGESTED LIST OF STUDY REFERENCES

#### 1 INTRODUCTION

- 1.1 In setting questions for the ATPL(H) examination, and as for any other flight crew examination, CASA tests to the syllabus. Candidates must bear in mind that the ATPL(H) examination is set to a standard based on their attending a properly structured course of adequate duration, with appropriate study material, and under qualified instruction and supervision.

#### 2 APPROACHES TO SELECTING STUDY REFERENCES

- 2.1 Until recently, few books have been written specifically for the new ATPL(H) syllabus. Local publishers have now produced a number of books to meet this requirement. Nonetheless, in some cases more than one book may be required to cover adequately a subject area. Candidates should expect their training organizations to provide course notes (perhaps as a supplement to a nominated publication) so that a topic may be accorded comprehensive study references.
- 2.2 To further assist the candidate source good study material, a list of study references has been compiled. This list will be revised at regular intervals, and include recommendations from the industry.
- 2.3 Inclusion in this list does not necessarily mean that questions will be based specifically on, or limited to, the publications. Equally, a candidate must not expect the correct answers of questions to be direct 'quotes' from any specific text of these publications. The list merely indicates that training organisations have found the publications as satisfactory references for studying to the syllabus.
- 2.4 However, in testing knowledge of some syllabus topics, certain situations, dictated mainly by the requirement for standardisation, demand referencing to specific books. The following examples represent these situations:
- where generic books differ markedly on certain topic areas, such as in terminology or procedures, a 'master' publication shall be nominated.  
*eg Rolls-Royce "The Jet Engine" for gas turbines topic in Aircraft Systems*
  - where the use of generic book is not available, adequate or practical, a 'type-specific' book (usually a Flight or Operations Manual) shall be nominated.  
*eg Sikorsky S76 Performance and Operations Handbook for the flight planning and performance subjects*

### **3 SELECTING FROM THE LIST**

- 3.1 Books marked with an asterisk (\*) are those that CASA nominates as the 'master' reference for purpose of standardisation, particularly of terminology and procedures. These will be subjected to periodic review, as new books come into the market.
- 3.2 CASA does not have the resource to conduct thorough evaluation of all the books on the list, and therefore cannot guarantee their suitability for study of the ATPL(H) syllabus topics. A large number of these have been added to the list on the recommendations of members of the training industry. Basically, the list provides guidance to candidates to source study materials.
- 3.3 The list may contain more than one reference text on a particular subject, and candidates must personally decide for themselves which would be appropriate. When making a purchase selection, candidates are advised to consult experienced instructors for the optimal choice. Generally, candidates attending a structured course may expect the schools to provide supplementary précis and notes, in addition to a publication, to adequately cover a syllabus topic.
- 3.4 Candidate will find that a large number of books on this list should already be in their possession. These would include the CAR, CAO, AIP, DAPs, CAAPs, Manual of Meteorology Volumes 1 and 2, the (old) CAA Operational Notes, the Global Positioning System and Australian Aviation Navigation, and a couple of Human Factors books used in the CPL examination.
- 3.5 CASA Flight Crew Licensing Web-site makes it possible for the (page pertaining to the) list to be updated without requiring a complete ATPL(H) Information Book change. It will carry its own Date of Issue, enabling candidates (and instructors) to be alerted to any new version. The list's Date of Issue will also be denoted on the Book cover.

**ATTACHMENT TO APPENDIX B OF PART IV  
(Reading List V1.0 - January 1999)**

**ATPL(H) EXAMINATION  
SUGGESTED LIST OF STUDY REFERENCES**

**FLIGHT PLANNING:**

Sikorsky S76 Performance & Operations Handbook Version 2.2\*

Civil Aviation Orders (CAO) 20-95.2

AIP Book

**PERFORMANCE & LOADING**

CAO 20.7.1B, Sub-Section 3 (Definitions only)\*

Sikorsky S76 Performance & Operations Handbook Version 2.2\*

**NAVIGATION:**

CAA Operational notes (NDB, VOR, ILS, DME, INS, RNAV, GPS)\*

The Global Positioning System and Australian Aviation Navigation\*

The NAVSTAR GPS by Tom Logsdon

Aviator's Guide to GPS by Bill Clarke

B767-300ER Operations Manual extract\* (*obtainable from FCL Section*)

Avionics & Flight Management Systems for the Air Transport Pilot

by Aviation Theory Centre

The Ground Studies for Pilots series by Underdown

Vol 1 - Radio Aids

Vol 3 - Nav General & Instruments

Aircraft Instruments & Integrated Systems by Pallett

Manual of Avionics by B Kendall

**(Reading List V1.0 - January 1999)****AERODYNAMICS & AIRCRAFT SYSTEMS**

Principles of Helicopter Flight by W.J. Wagtendonk\*

The Jet Engine by Rolls-Royce\*

Aircraft Gas Turbine Engine Technology by Irwin Treager

Airframe & Powerplant Mechanics by FAA (2 volumes)\*

The Aircraft Gas Turbine Engine & Its Operation by Pratt & Whitney

B767-300ER Operations Manual extract\* (*also under Nav*)

Avionics & Flight Management Systems for the Air Transport Pilot  
by Aviation Theory Centre (*also under Nav*)

Aerodynamics, Engines & Airframe Systems for the Air Transport Pilot  
by Aviation Theory Centre

Flying Glass by Rob Avery

Pallett's Aircraft Instruments & Integrated Systems (*also under Nav*)

The Professional Pilot Study Guide Series by Mike Burton

(*also printed as The Commercial Pilot's Study Manual Series - 1997 - in 4 volumes*)

Vol 2 - Gas Turbine Engines

Vol 4 - Electrics\*

Vol 5 - Hydraulics\*

Vol 6 - Cabin Pressurisation\*

Vol 7 - Pneumatics\*

Vol 8 - Advanced Flying Systems

Aircraft - Electricity & Electronics (5th Ed) by Eismin

Aircraft Systems by Ian Moir & Allan Seabridge

Automatic Flight Controls by Pallett

Modern Airmanship by Van Sickle

Basic Science for Aerospace Vehicles (4<sup>th</sup> Edition) by Northrop

**(Reading List V1.0 - January 1999)**

**METEOROLOGY:**

Manual of Meteorology, Volumes 1 and 2, by Bureau of Meteorology\*

AIP Book (GEN 3.5)\*

Handbook of Aviation Meteorology by (the British) Meteorological Office

**AIR LAW:**

CAR, CAO, AIP *complete*, CAAPs\*

Flight Rules and Air Law for the Air Transport Pilot  
by Aviation Theory Centre

**HUMAN FACTORS:**

Air Craft - Human Performance & Limitations by Tony Wilson\*

Human Factors for Pilots by Roger Green et al\*

Human Factors in Flight by Frank Hawkins\*

**APPENDIX C TO PART IV****FLIGHT PLANNING****1 INTRODUCTION**

- 1.1 The Flight Planning examination tests Section 5 of the syllabus with reference to the pre flight planning considerations of item 5.2, *and* the practical applications of 5.1 (a) to (i).
- 1.2 The examination will have a mixture of questions on general knowledge and 'practical' problems.

**2 PRE FLIGHT PLANNING CONSIDERATIONS**

- 2.1 Questions testing Section 5.2 are of the general knowledge type, with the CAO and AIP *Book* permitted. While this element of the subject Part adopts the principle of an '*open-book*' format, the candidate is advised that pre-study and general familiarity with the relevant rules and procedures are necessary to answer the questions within the time permitted.

**3 FLIGHT PLANNING**

- 3.1 Questions testing Section 5.1 are, in the main, 'practical' types based on the Sikorsky S76 helicopter, and in general will require the use of *the Sikorsky S76 Performance and Operations Handbook* (hereafter referred to as the *Handbook*). Questions may be based on any section of the Handbook.
  - 3.1.1 The flight planning instructions/data in the Handbook, that have to be observed when calculating a solution, may also be collectively termed as *Company Policy*.
- 3.2 All data required to solve the question, other than those to be found in the Handbook and navigational charts, will be provided in each individual question.
  - 3.2.1 The relevant data may be in the form of one or more of the following:
    - a. Route forecast
    - b. ATIS, TAF, METAR, SPECI or TTF
    - c. In-flight data provided by GPS or other onboard navigation systems
    - d. Distance and track of route sector

- 3.2.2 Distance and track of route sector may be obtained from chart printed information or by measurement.
- 3.3 In most questions candidates will be required to refer to a specific route on an En-Route Chart, or to specific points on an En-Route Chart.
- 3.4 The availability of aerodromes/heliports/helipads may be indicated by the use of the terms "suitable" and "acceptable". This may be in reference to a forecast or simply a statement of the aerodromes/heliports/helipads status. This statement of status will generally be for the period of possible use.
- 3.5 In general the guidelines for working calculations are balanced between simplicity, conservative planning and recognition of the greater accuracy that can be achieved by the use of the electronic calculator.

#### **4 SELECTION OF CRUISING ALTITUDES/FLIGHT LEVELS**

- 4.1 Questions may relate to either IFR and VFR operations, though the majority will be under the IFR. Unless otherwise stated in a question, all operations will cruise at altitudes/flight levels in accordance with the AIP Table of Cruising Levels, and all IFR OEI operations will be conducted at sector LSALT. Cruise level for VFR OEI operations will be given.
- 4.2 Reference to 'optimum level' means the optimum cruising/flight level for the estimated mid-zone weight of a cruise sector. Relevant limits and the IFR Levels must be considered when selecting optimum level.

#### **5 DESCENT AND HOLDING**

- 5.1 Descent Distance - When planning the descent, plan to arrive overhead the destination airfield at 1500 feet AGL.
- 5.2 Holding - Holding is to be conducted using the TAS and Fuel flow stipulated in the Handbook.

#### **6 ONE ENGINE INOPERATIVE (OEI)**

- 6.1 Calculation of Fuel Flow - Fuel flow should be based on the temperature at the OEI cruise level.
- 6.2 OEI Holding - OEI Holding is to be conducted using standard OEI TAS and OEI fuel flow stipulated in the Handbook.

## **7 REQUIRED ACCURACY LIMITS**

- 7.1 Use of Forecast Wind and Temperature Data.
  - 7.1.1 Climb - Use wind and temperatures at 2/3 the initial cruise level.
  - 7.1.2 Descent - Use wind at 1/2 the final cruise level.
  - 7.1.3 Extract wind to the nearest 10 degrees and 5 knots. Interpolation between levels is not necessary unless there is a significant wind velocity and/or temperature gradient.
- 7.2 Fuel Flows - determine to the nearest whole pound/hour (eg. 524 lb/hr).
- 7.3 Time Intervals - determine to the nearest whole minute (eg. 26 minutes).

## **8 CRITICAL POINT (CP) AND POINT OF NO RETURN (PNR)**

- 8.1 CP has the same meaning as Equi-Time Point (ETP).
  - 8.1.1 CP calculations may involve any flight condition, both normal and abnormal operations. Descent to an aerodrome, and any approach or holding at an aerodrome, may be ignored for determination of the CP position. However, descent/approach/holding are to be included when determining the fuel required to cover a CP situation.
  - 8.1.2 Initial climb to cruise level must be included in the calculation of time or fuel burn off to a CP.
- 8.2 PNR calculations may be based on normal operations to, and normal or abnormal operations from the PNR.
  - 8.2.1 Initial climb to cruise level must be included in the calculation of PNR position, as per Company Policy. Descent/approach/holding to the diversion aerodrome must also be considered when determining a PNR.

## **9 AVERAGE DATA**

- 9.1 Average data may be used where appropriate. Candidates should use their discretion as to the use of average data or whether a more detailed calculation should be made.
- 9.2 Generally, in calculations which cover more than one zone of a flight, as in CP and/or PNR problems, or when determining fuel burn from a given point to landing, the use of average data may be appropriate. Any of the common methods of averaging data such as winds and temperatures are suitable for examination purposes. Average fuel flows and speeds should be extracted at the estimated mid-zone weight of the flight zones.
- 9.3 When the term "average ground speed" is used, no additional allowance for climb need be made when calculating the ETI or Fuel Burn Off to any point during the flight.
- 9.4 ERSA is not a permitted reference for this paper, hence when aerodrome elevation is not given, assume the aerodrome is at MSL for the purpose of calculating any climb allowance required, or any performance limitation.

## **10 UNIT CONVERSION**

- 10.1 1 kilogram (kg) = 2.205 pounds (lb)

## **11 FUEL GAUGE READINGS**

- 11.1 The fuel gauges in the Sikorsky S76 read in pounds. All fuel quantities, fuel flows and initial fuel weights will be given in pounds.

## **12 ROUNDING OFF PROCEDURES**

- 12.1 Where rounding off is required at the end of a calculation, round down to the nearest unit for fractions less than one half, and round up to the nearest unit for fractions of one half or more.

*Examples: 518.1 lb/hr to 518.4 lb/hr would round down to 518 lb/hr  
518.5 lb/hr to 518.9 lb/hr would round up to 519 lb/hr*

**13 INTERPOLATION OF DATA**

- 13.1 Interpolation of data outside the highest and lowest values given for a particular item in the flight manual is not permitted (or required).

*Examples: At a MZW of 10000 lb with a DA of 8700 ft, the fuel flow with 2 engines operating would be 488 lb/hr, the same value as a DA of 8000 ft*

*For OEI cruise under ISA+25 conditions, the fuel flow would be 440 lb/hr, the same value as ISA+20 conditions*

*For OEI cruise under ISA-10 conditions, the fuel flow would be 420lb/hr, the same value as ISA conditions*

**14 ENROUTE ALTERNATE AERODROMES**

- 14.1 For examination purposes only, in a question where there is no statement regarding the availability of enroute ALTNaerodromes, it is to be assumed that, either a suitable enroute ALTN is available, or there is no fuel limitation imposed in the event of an engine failure at the CP/OEI.

## SPECIMEN QUESTIONS

### Question 1 - Syllabus Item 5.1(i)

You are planning an IFR flight from DARWIN to KUPANG. Flight details are:

Track DARWIN to KUPANG	283M
Distance DARWIN to KUPANG	450 nm
TOW at DARWIN	10800 lb
Fuel	1850 lb at startup
Cruise level	A060 for 2 engines operating A020 for OEI
Wind	110M/30 kt at A060 140M/15 kt at A020
Temperature	ISA+20 at all levels and places
QNH	1013 HPA
LSALT	1900 ft

The forecast conditions are IMC enroute with an instrument approach expected on arrival at KUPANG. DARWIN is forecast to remain CAVOK for the duration of the flight. Your calculation of the distance from DARWIN to the PNR/OEI is closest to -

- (A) 179 nm.
- (B) 188 nm.
- (C) 196 nm.
- (D) 228 nm.

### Question 2 - Syllabus Item 5.1(d)

You are planning an IFR flight from DARWIN to KUPANG. Flight details are:

Track DARWIN to KUPANG	283M
Distance DARWIN to KUPANG	450 nm
TOW at DARWIN	10200 lb
Fuel	1850 lb at startup
Cruise level	A060
Wind	110M/30 kt at A060
Temperature	ISA+15 at all levels and places
QNH	995 HPA

The fuel flow for the flight is closest to -

- (A) 480 lb/hr.
- (B) 484 lb/hr.
- (C) 488 lb/hr.
- (D) 490 lb/hr.

**Question 3 - Syllabus Item 5.1(f)**

You are flying IFR from TINDAL to DARWIN, and are maintaining the ERC track of 321M. TAS is 140 kt with a W/V of 050M/30 kt. At 0124 UTC you divert right of track to avoid thunderstorms.

Your flight progress is as follows:

0124 UTC:     Alter heading to 021M  
 0134 UTC:     Alter heading to 261M  
 0144 UTC:     Alter heading to regain flightplan track

At 0144 UTC your position will be closest to -

- (A) 5 nm left of track.
- (B) 5 nm right of track.
- (C) 10 nm left of track.
- (D) 10 nm right of track.
- (E) on planned track.

**Question 4 - Syllabus Item 5.1(i)**

You are planning an IFR flight from DARWIN to KUPANG. Flight details are:

Track DARWIN to KUPANG	283M
Distance DARWIN to KUPANG	450 nm
Cruise level	A060 for 2 engines operating A020 for OEI
Wind	110M/30 kt at A060 140M/15 kt at A020
Temperature	ISA+20 at all levels and places
QNH	1013 HPA

The forecast conditions are IMC enroute with an instrument approach expected on arrival at KUPANG. DARWIN is forecast to remain CAVOK for the duration of the flight.

Prior to departure, your calculation of the ETI to the CP/OEI is closest to -

- (A) 59 minutes.
- (B) 68 minutes.
- (C) 73 minutes.
- (D) 108 minutes.

**APPENDIX D TO PART IV****PERFORMANCE AND LOADING****1 INTRODUCTION**

- 1.1 The Performance and Loading examination tests these two topic areas, with a mixture of questions on both general knowledge and 'practical' problems.
- 1.2 Performance questions examine Section 8 of the syllabus with reference to the following items:
- Item 8.1 Take-off and Landing Performance
  - Item 8.2 Climb, Cruise and Descent Performance
- 1.2.1 'Practical' performance questions are based on the Sikorsky S76 Helicopter and will usually require the use of the Handbook.
- 1.3 Loading (Weight and Balance) questions examine Section 8 of the syllabus with reference to item 8.3 - Weight and Balance.

**2 METHODS OF CALCULATION**

- 2.1 Paragraphs 3.2 to 12.1 inclusive of Appendix C to Part IV (Flight Planning), where appropriate, also apply to all Performance and Loading questions.

**3 REQUIRED ACCURACY LIMITS**

- 3.1 Centre of Gravity Moments - determine to one decimal place (eg. 16029.2 kg/mm/1000).
- 3.1.1 Centre of Gravity Position - determine to the nearest millimetre (eg. 5073 mm).
- 3.2 MTOW/MLW graphs - determine to plus/minus 20 pounds.
- 3.3 ROC graphs - determine to plus/minus 20 fpm.
- 3.4 For examination purposes, unless a question refers directly to the 'Airspeed Calibration' charts in the Handbook, it is to be assumed that IAS equals CAS.

## 4 ROUNDING OFF PROCEDURES

- 4.1 Where rounding off is required at the end of a calculation, round down to the nearest unit for fractions less than one half, and round up to the nearest unit for fractions of one half or more.

*Examples: 16825.11 kg/mm/1000 to 16825.14 kg/mm/1000 would round down to 16825.1 kg/mm/1000*

*16825.15 kg/mm/1000 to 16825.19 kg/mm/1000 would round up to 16825.2 kg/mm/1000*

- 4.1.1 **The exception to the rounding UP rule is when the method affects safety adversely, where rounding up will involve exceeding final payload or performance limitations. In such cases, the commonsense approach would be to round DOWN**

*Examples: Where a calculation determines the payload capacity is 9.8 boxes, the final answer would round **down** to 9 boxes*

*Where a calculation determines the payload capacity is 11.7 passengers, the final answer would round down to 11 passengers*

## 5 CENTRE OF GRAVITY (CG) CALCULATIONS

- 5.1 The helicopter must be within CG limitations as per Figure 1.2.1 in the Handbook for all possible weights during the flight from Takeoff Weight to Zero Fuel Weight. For examination purposes Figure 1.2.1 should be entered using Gross Weight in kg and Arm in mm.
- 5.2 Fuel moments are to be calculated using Figure 1.2.10 in the Handbook. For examination purposes the required procedure is to convert the fuel load from pounds to kilograms, and interpolate for values not directly available from the table by using the MOMENT/1000 (kg/mm) column. Interpolation to one decimal place is required (see paragraph 12 - Rounding Off Procedures).
- 5.3 For examination purposes, the preferred method of determining the MOMENT/1000 (kg/mm) for useful load other than fuel, is to multiply the weight of an item being loaded by the arm of the item as found on the appropriate Weight and Moment table (see paragraph 12 - Rounding Off Procedures).

## SPECIMEN QUESTIONS

### Question 1 - Syllabus Item 8.3.3.2(a)

You are planning your departure for a multi-stage flight to some offshore floating rigs. The helicopter is loaded as follows:

Crew	2 at 80 kg each
FOB at startup	1480 lb
Row C1	4 passengers at 80 kg each
Row C2	3 passengers at 80 kg each
Row C3	4 passengers at 75 kg each
Cargo in C6	each pax has 12 kg of baggage

The aircraft is in the standard configuration. The flight to the first rig is 54 minutes at a cruise fuel flow of 500 lb/hr. At the first rig you will be off-loading the 4 passengers from row C1, and their baggage. You will then pick up an additional 188 kg of baggage/freight to be loaded into compartment C6 for carriage to the next rig. You will do a rotors running turnaround on the first rig.

From takeoff at the initial departure point to takeoff at the first rig, what (approximate) movement, if any, has the CG position experienced?

- (A) No significant change.
- (B) 110 mm forward.
- (C) 125 mm rearward.
- (D) 150 mm rearward.

### Question 2 - Syllabus Item 8.1.1

In a Category A operation, the take-off distance is the distance required to achieve -

- (A) CDP.
- (B)  $V_{\text{toss}}$ .
- (C) a height of 35 ft at  $V_{\text{toss}}$ .
- (D) a height of 50 ft at  $V_{\text{toss}}$ .
- (E) a height of 50 ft at  $V_y$ .

### Question 3 - Syllabus Item 8.2.3.3(c)

For an IFR flight in the S76, what is the maximum permissible weight for operations at 6000 ft under ISA conditions, with Anti Ice OFF, EAPS OFF and Bleed Air OFF?

- (A) 10200 lb.
- (B) 10350 lb.
- (C) 10600 lb.
- (D) 10750 lb.

**APPENDIX E TO PART IV****AERODYNAMICS AND AIRCRAFT SYSTEMS****1 INTRODUCTION**

1.1 The Aerodynamic and Aircraft Systems examination tests Section 2 of the syllabus with reference to the following items:

- Item 2.1 Advanced Aerodynamics
- Item 2.2 Airframe and Systems
- Item 2.3 Power Plants - Turbine Engine
- Item 2.4 Engine Instruments
- Item 2.5 Flight Instrumentation Systems
- Item 2.6 Automatic Flight Control System
- Item 2.7 Warning and Recording Equipment

**2 THE USE OF 'TYPE SPECIFIC' REFERENCES FOR TRAINING**

2.1 Generally questions in this examination will test items of the syllabus with a generic approach, except for certain topic areas where there is a lack of readily available or suitable reference material. In such cases, the reference material nominated for the study of such items may be that of an aircraft Pilot or Operations Manual.

2.1.1 The use of the Boeing 767-300ER Operations Manual Extract for the study of some items of the modern aircraft systems syllabus also represents such an approach. While this reference is a text for aeroplane systems, the information contained within (eg. TCAS, GPWS, EFIS, EICAS, FMS etc), are sufficiently generic as to satisfy the training requirements of the helicopter syllabus.

2.1.2 Use of this reference ensures a reliable source of training material as well as standardisation. The latter is necessary in a multi-choice type of examination.

2.1.3 Another area where some form of standardisation is required, is when generic books differ markedly on certain areas (eg. terminology or procedures). In such a situation, a book shall be nominated as the 'master' or authoritative reference.

*e.g. Rolls-Royce "The Jet Engine" for the gas turbines topic*

- 2.2 Notwithstanding the use of '*type specific*' references in the training of some syllabus areas of the Aerodynamics and Aircraft Systems subject, the testing philosophy/concept for this topic, as represented by the examination questions, is generic in nature. This approach is no more different than that for the Flight Planning or Performance subjects, where training to learn the subjects' fundamentals, principles and application of principles, in accordance with the syllabus, requires the use of a nominated '*type specific*' reference material, such as a modern aircraft Flight or Operations Manual. The training objectives to support the attainment of required knowledge and standards may still be achieved through this way.

### **3 USE OF AIRCRAFT SYSTEM DIAGRAMS**

- 3.1 Some system questions may be based on generic system diagrams. Where '*type specific*' diagrams are used, these are to be considered as generic diagrams, as discussed in paragraph 2.
- 3.2 Where relevant, the appropriate diagrams will be available to candidates during the examination. This may be in the question itself, or in the examination Work Book.
- 3.3 System diagrams will only be tested in examination when these have been made available to candidates via registered theory training providers, the ATPL(H) Information Book or the CASA Flight Crew Licensing Web-site.
- 3.4 The labelling tags for system components and/or typical faults/conditions on some of these diagrams, made available as mentioned in paragraph 3.3, may not re-appear in the examination Work Book. In such cases, candidates are expected to identify correctly the unlabelled item or fault.

### **4 COMMONALITY WITH AEROPLANE SYSTEMS**

- 4.1 The modern helicopter has incorporated many aspects of aeroplane technology and equipment to the extent that general system differences with the typically modern turbo-prop transport aeroplane are rapidly disappearing. Where questions in this subject Part are seen to be based on aeroplane systems, these should be considered as questions testing knowledge of generic *aircraft* systems, and are therefore equally applicable to helicopters.
- 4.2 Where a question makes reference to the term *aeroplane*, this shall taken to mean *aircraft*. All such questions apply equally to the ATPL(H) examination.

## **SPECIMEN QUESTIONS**

### **Question 1 - Syllabus Item 2.1.8**

**During stabilised autorotative flight a driving force is provided when the total reaction (TR) is inclined forward of the axis of rotation. Over what portion of the blade does a driving force generally occur?**

- (A) The entire length of the blade.
- (B) The outboard section of the blade.
- (C) The centre section of the blade.
- (D) The inboard section of the blade.

### **Question 2 - Syllabus Item 2.2.5.1**

**An aircraft hydraulic system produces 3000 psi, and the main landing gear (MLG) actuating cylinder has a piston area equivalent to 10 square inches. What force is exerted by the actuator when the MLG is retracted?**

- (A) 30 pounds.
- (B) 300 pounds.
- (C) 3000 pounds.
- (D) 30,000 pounds.
- (E) 300,000 pounds.

### **Question 3 - Syllabus Item 2.3.6**

**Which is the most common type of starter used on gas turbine engines fitted to modern large commercial helicopters?**

- (A) Solid propellant starter.
- (B) Electric motor starter.
- (C) Cartridge starter.
- (D) Gas turbine starter.
- (E) APU starter.

## APPENDIX F TO PART IV

## NAVIGATION

## 1 INTRODUCTION

1.1 The Navigation examination tests Section 4 of the syllabus, which is common to both the Helicopter and Aeroplane, with reference to the following items:

- Item 4.1 Navigation Charts.
- Item 4.2 Time Zones.
- Item 4.3 Flight Instruments.
- Item 4.4 Radio Navigation.
- Item 4.5 Basic Radar Principles.
- Item 4.6 Route Navigation.
- Item 4.7 Area Navigation

1.2 The examination will have a mixture of questions on general knowledge and 'practical' problems.

1.2.1 'Practical' questions may be based on any appropriate item of the syllabus.

1.2.2 Questions are typical of those involving high altitude, high speed aircraft on domestic and international flights.

1.2.3 Where a question makes reference to the term *aeroplane*, this shall be taken to mean *aircraft*. All such questions apply equally to the ATPL(H) examination.

## 2 PRACTICAL NAVIGATION

2.1 Candidates may be required to refer to a specific route on an En Route Chart (ERC) Low or High, PCA and/or a Terminal Area Chart (TAC). Candidates are to supply these charts.

2.2 Practical navigation questions may contain a reference to Route Sector Wind and Temperature (RSWT) or Grid Point Wind and Temperature (GPWT) forecasts.

2.3 Winds other than those presented in a recognised forecast format will be annotated T (true) or M (magnetic).

2.4 **RVSM.** Candidates are to assume that the 'examination aircraft' is *not* RVSM-approved, but has been cleared to operate in all RVSM airspace in accordance with conventional IFR cruising levels.

### 3 **CRITICAL POINT (CP), POINT OF NO RETURN (PNR) AND POINT OF SAFE DIVERSION (PSD)**

- 3.1 CP has the same meaning as Equi-Time Point (ETP).
- 3.2. The term PNR is used for situations where the return flight is to an on-track aerodrome, either the departure point or an alternate aerodrome.
- 3.3 The term PSD is used for situations where flight from the PSD is to an off-track alternate aerodrome.
- 3.4 The term '*safe endurance*' used in a PNR or PSD problem means endurance remaining excluding reserves of fuel (or equivalent time). The term '**total endurance**' means endurance remaining including reserves of fuel (or equivalent time).
  - 3.4.1 When total endurance is specified in a question the required reserves to be allowed will be specified [eg. Variable Reserve (VR) 10% of safe endurance and Fixed Reserve (FR) 30 minutes].
- 3.5 CP, PNR and PSD calculations may involve normal and abnormal operations.
- 3.6 Descent to an aerodrome may be ignored when determining the position of a CP, PNR or PSD.

### 4 **AVERAGE DATA**

- 4.1 Average data may be used where appropriate. Candidates should exercise their discretion as to whether the use of average data would be appropriate, or a more detailed calculation should be made.
  - 4.1.1 Generally, in calculations which cover more than one zone of a flight, as in CP, PNR and PSD problems, the use of average data may be appropriate. Any of the common methods of averaging data such as winds and temperatures are suitable for examinations purposes

## SPECIMEN QUESTIONS

### Question 1 - Syllabus Item 4.4.2.3(c)

Power has been applied to a conventional flight instrument panel which incorporates an electronic digital readout of DME distance. What will this readout display when no DME station is selected?

- (A) It will appear blank.
- (B) It will display dashes.
- (C) It will be masked.
- (D) It will display zeros.

### Question 2 - Syllabus Item 4.6.2(a)

Using a forecast average wind component of 30 kt HEAD, the top-of-climb position for an aircraft is determined to be 115 nm from departure point. Climb time is 19 min. If the average wind component actually experienced during the climb was 20 kt TAIL, the distance from departure point to the actual top-of-climb position would be closest to -

- (A) 120 nm.
- (B) 130 nm.
- (C) 145 nm.
- (D) 165 nm.

### Question 3 - Syllabus Item 4.6.4(a)

Refer to ERC L4

Flight .... MOUNT ISA (MA) (S2040 E13929) - CHARLEVILLE (CV)

Route .... W356

Inflight position:

0355 UTC:	MA VOR/DME	radial 125/65 nm
0418 UTC:	LONGREACH VOR	radial 270
	WINTON NDB	199 from

HDG and TAS between these two positions have been constant at 135M and 420 kt.

The average wind between the 0355 UTC and 0418 UTC positions is closest to -

- (A) 235M/75 kt.
- (B) 195M/75 kt.
- (C) 265M/30 kt.
- (D) 175M/30 kt.

**APPENDIX G TO PART IV****METEOROLOGY****1 INTRODUCTION**

1.1 The Meteorology examination tests Section 6 of the syllabus, which is common to both the Helicopter and Aeroplane, with reference to the following items:

- Item 6.1 The Atmosphere.
- Item 6.2 Clouds and Precipitation.
- Item 6.3 Motion of the Atmosphere.
- Item 6.4 Visibility.
- Item 6.5 Ice Accretion.
- Item 6.6 Airmasses and Fronts.
- Item 6.7 Airmasses and Frontal Analysis.
- Item 6.8 Synoptic Charts.
- Item 6.9 Upper Level Weather.
- Item 6.10 Upper Level Charts.
- Item 6.11 Climatology.
- Item 6.12 Met Observations.

1.2 The examination will have a mixture of questions on general knowledge and 'practical' problems.

1.2.1 'Practical' questions may be based on any appropriate item of the syllabus, and involves pilot interpretation of charts, satellite photographs, and weather forecasts and reports. These will be provided during the examination.

1.2.2 Questions are typical of those involving high altitude, high speed aircraft on domestic and international flights.

1.2.3 Where a question makes reference to the term *aeroplane*, this shall taken to mean *aircraft*. All such questions apply equally to the ATPL(H) examination.

## SPECIMEN QUESTIONS

### Question 1 - Syllabus Item 6.10.2(b)

**Work Book, page \*, SIGWX PROG 02 refers.  
What is the speed of the jet stream over YPPD?**

- (A) 50 knots.
- (B) 100 knots.
- (C) 200 knots.
- (D) 420 knots.

*\* the page number relates to the actual page of the Work Book provided during the examination.*

### Question 2 - Syllabus Item 6.12.5

**TTF SPECI YBTL 0800UTC 03010KT 4000 TS BKN030CB SCT120 27/24 Q1008  
FM0830 03010KT 9999 SH SCT035TCU  
INTER 0830/1100 5000 TS SCT010SCT030CB**

**The visibility expected for arrival at TOWNSVILLE (YBTL) at 1000 UTC is -**

- (A) 5000 metres.
- (B) 10 km or more, reducing to 5000 metres for periods of 30 minutes or less.
- (C) 10 km or more.
- (D) 4000 metres reducing to 5000 metres for periods of less than 30 minutes.

### Question 3 - Syllabus Item 6.3.4

**Prior to departure you observe that there are cumulus clouds with base 5000 feet in the vicinity of your take-off flight path. Light rain is seen beneath the clouds though the precipitation does not reach the ground.**

**You delay your departure to avoid severe turbulence and down draft on take-off, as you anticipate the hazards associated with a -**

- (A) thunderstorm gust front.
- (B) mountain wave.
- (C) microburst.
- (D) radiation inversion.

## APPENDIX H TO PART IV

### HUMAN FACTORS

#### 1 INTRODUCTION

1.1 The Human Factors examination tests Section 7 of the syllabus, which is common to both the Helicopter and Aeroplane, with reference to the following items:

- Item 7.1 Altitude Flying.
- Item 7.2 Human Information Processing.
- Item 7.3 Human Behaviour.
- Item 7.4 Flying and Health.

1.2 Questions are typical of those involving multi-crew, turbine powered, high altitude, high speed aircraft on domestic and international flights.

1.2.1 Where a question makes reference to the term *aeroplane*, this shall taken to mean *aircraft*. All such questions apply equally to the ATPL(H) examination.

#### 2 REFERENCE MATERIAL

2.1 The wide range of reading material available on this topic, with their rich variety of terminology and information, has made standardisation a fairly important consideration. CASA has therefore nominated the following reference material for the study of this syllabus topic:

- a. Air Craft - Human Factors & Limitations by Tony Wilson
- b. Human Factors For Pilots by Roger G Green et al
- c. Human Factors In Flight by Frank H Hawkins

2.1.1 The use of these textbooks as training material builds up logically, and consolidates firmly, on the aeronautical knowledge training attained during the training to the PPL/CPL syllabus.

## SPECIMEN QUESTIONS

### Question 1 - Syllabus Item 7.1.2.6

**While in flight, you notice the other pilot is breathing heavily, her speech is slurred and she complains of feeling dizzy. You also notice her lips and fingertips are blue-tinged. She is probably suffering from -**

- (A) hyperventilation.
- (B) CO poisoning.
- (C) hypoxia.
- (D) food poisoning.

### Question 2 - Syllabus Item 7.2.2.1(h)

**How should a pilot look at a visual object in poor light conditions, so that her night vision may be optimised?**

- (A) In the most direct manner.
- (B) A little from the side of the eye.
- (C) Directly, and one eye closed.
- (D) A little from the side of the eye, and with the other eye closed.

### Question 3 - Syllabus Item 7.3.2.2(e)

**In a multi-crew cockpit environment, a captain is more likely to heed any crucial information provided by the co-pilot if it is delivered in a communication style that is both -**

- (A) assertive and submissive.
- (B) assertive and supportive.
- (C) aggressive and submissive.
- (D) aggressive and supportive.

**APPENDIX I TO PART IV****AIR LAW****1 INTRODUCTION**

- 1.1 The Air Law examination tests Section 3 of the syllabus, which is common to both the Helicopter and Aeroplane, with reference to the following items:
- Item 3.1 Aircraft Nationality and Registration.
  - Item 3.2 Airworthiness of Aircraft.
  - Item 3.3 Personnel Licensing.
  - Item 3.4 Rules of the Air.
  - Item 3.5 Procedures for Air Navigation.
  - Item 3.6 Air Traffic Services.
  - Item 3.7 Rules of the Air and Air Traffic Services
  - Item 3.8 Aeronautical Information Service
  - Item 3.9 Aerodromes.
  - Item 3.10 Facilitation.
  - Item 3.11 Search and Rescue.
  - Item 3.12 Security.
  - Item 3.13 Aircraft Accidents and Incidents.
  - Item 3.14 Air Service Operations.
- 1.2 Generally questions are based on multi-crew, turbine powered, high altitude, high speed aircraft, with emphasis being placed on the knowledge required of the pilot in command.
- 1.2.1 These questions will mainly test rules and procedures pertaining to IFR Charter and RPT flights, both domestic and international. However, candidates are expected to possess a very sound foundation of Private and VFR operations.
- 1.2.2 The examination is organised along an *'open-book'* format, but candidates will be required in some questions to exercise a high level of competency in 'factual recall' on the basic rules and procedures in order to answer the questions within the time permitted.
- 1.2.3 Where a question makes reference to the term *aeroplane*, this shall be taken to mean *aircraft*. All such questions apply equally to the ATPL(H) examination.

## SPECIMEN QUESTIONS

### Question 1 - Syllabus Item 3.14(j)

**A refuelling truck is parked behind a twin engine turbo-jet aircraft in direct line with one of the engines. What is the minimum distance the aircraft should be from the truck before it may move under its own power from the stationary position?**

- (A) No specified minimum distance.
- (B) 15 metres.
- (C) 23 metres.
- (D) 30 metres.
- (E) 46 metres.

### Question 2 - Syllabus Item 3.7.2.4(b)

**What are the respective ceiling and visibility minima below which LAHSO operations are NOT permitted:**

- (A) 1000 ft and 5000 metres.
- (B) 1500 ft and 5000 metres.
- (C) 1000 ft and 8000 metres.
- (D) 1500 ft and 8000 metres.

### Question 3 - Syllabus Item 3.14(g)

**A modern twin jet pressurised aircraft is being flown on a passenger-carrying CHTR flight. No quick-donning oxygen mask is available to the pilots.**

**In such a situation, at least one of the pilots seated at the controls must use supplemental oxygen at all times that the aircraft is operating above -**

- (A) A100.
- (B) FL 140.
- (C) FL 250.
- (D) FL 450.