CASR PART 141 OPERATIONS MANUAL

Paul John Reddish t/as Advanced Aviation Training

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LIST OF EFFECTIVE PAGES

CASR PART 141 OPERATIONS MANUAL

0 PREFACE

0.1 AMENDMENT RECORD

Version	Date	Amendment Details	Amended by
1	26/05/2020	First Addition	Paul Reddish

0.2 DISTRIBUTION LIST

Copy No.	Holder
1	HOO
2	CEO
3	CASA

0.3 ABBREVIATIONS, ACRONYMS AND DEFINITIONS

Abbreviations

In the context of this manual, the following abbreviations are used:

Abbreviation	Meaning
A	Aeroplane
ABN	Australian Business Number
AC	Advisory Circular
AFM	Aircraft Flight Manual (or Pilot Operating Handbook - POH)
AGL	Above Ground Level
AIP	Aeronautical Information Publication Australia
ALA	Aircraft Landing Area
AOC	Air Operator's Certificate
AOD	Alcohol and Other Drugs
ARN	Aviation Reference Number
ASA	AirServices Australia
ATSB	Australian Transport Safety Bureau
CAA	Civil Aviation Act
CAAP	Civil Aviation Advisory Publication
CAOs	Civil Aviation Orders - functional documents enabling practical use to be made of a Civil Aviation Regulation
CAR	Civil Aviation Regulations 1988 - statutory aviation regulations of the Commonwealth of Australia

Abbreviation	Meaning
CASA	Civil Aviation Safety Authority
CASR	Civil Aviation Safety Regulations 1998 - statutory aviation regulations of the Commonwealth of Australia
CEO	Chief Executive Officer
CENSAR	Centralised database to store **SAR**TIME managed by Airservices Australia
CPL	Commercial Pilot Licence
CTA	Controlled Airspace
CTR	Control Zone
DAME	Designated Aviation Medical Examiner
DAMP	Drug and Alcohol Management Plan
ELT	Emergency Locator Transmitter
ERSA	En Route Supplement, Australia - a CASA/Air Services Australia document listing full information, including layout diagrams, on all licensed (and some unlicensed) aerodromes
FCM	Flight Crew Member
FDP	Flight Duty Period - means a period of time which: a) Starts when a person is required by an AOC holder to report for a duty period in which one or more flights as an FCM are undertaken b) Ends not less than 15 minutes after the end of the person's final flight as an FCM.
Flight Crew	A reference to a company flight instructor and their student in the context of Part 141 Flight Training
FOI	Flying Operations Inspector (CASA)
FRMS	Fatigue Risk Management System
HF	Human Factors
HOO	Head of Operations
IAW	In accordance with
IFR	Instrument Flight Rules
MOS	Manual of Standards
MR	Maintenance Release
NM	Nautical Mile
Navex	Navigation Exercise
Non-Significant change	Any change not otherwise defined as a significant change in relation to Part 141 Flight Training
NOTAM	Notice to Airmen - a document issued by CASA or ASA to provide operational information to pilots which supersedes that available in other publications
NTS	Non-Technical Skills
NVFR	Night VFR
PIC	Pilot-in-command - the pilot responsible for the operation and safety of the aircraft
PPL	Private Pilot Licence
PUS	Permissible Unserviceability
RPL	Recreational Pilot Licence
S&P	Standardisation and Proficiency
SAR	Search and Rescue
SARTIME	Time after which a Search and Rescue operation is mounted
Significant change	Any change which requires the approval of CASA. Refer to CASR 141.025 for more information
SMS	Safety Management System
SSAA	Safety Sensitive Aviation Activity
Student	Any person undergoing training at Advanced Aviation Training
VFR	Visual Flight Rules
W&B	Weight & Balance

Definitions

In the context of this manual, the following terms are defined:

- Advanced Aviation Training means the Part 141 Certificate holder
- the ***"company"*** means Advanced Aviation Training

This manual uses the following words to convey levels of requirement:

- ***'must'*** is used in relation to an obligation or requirement
- ***'should'*** is used to signify a recommendation that is not a requirement.

VOLUME 1 POLICY AND PROCEDURES

1.1 OPERATOR INFORMATION

Description	Details
Name	Advanced Aviation Training
Trading name	Advanced Aviation Training
ABN	17575276055
ACN	
Operational headquarters - address	Hanger 58 Wirraway Dr Rothwell QLD 4022
Phone	0419177102
Fax	
Email	Reddishaviation@gmail.com
Training base - address	Hanger 58 Wirraway Dr Rothwell QLD 4022
Training base - phone	0419177102
Registered Office Address	130 King Street Woody point QLD 4019

Key Personnel

Title	Name	Mobile	Email
CEO	Maree Fay Reddish	0407583388	reddishm@bigpond.com
HOO	Paul John Reddish	0419177102	Reddishaviation@gmail.com

Other Personnel and Services

Organisation	Name	Phone	Email / internet	Fax
Maintenance				
AVFAX				1800 805 150
CENSAR		1800 814 931		
NAIPS			http://www.airservicesaustralia.com/flight-briefing	
Search & Rescue		1800 815 257		
ATSB (notifications)		1800 011 034		
AUSAR		1800 815 257		

1.2 ORGANISATIONAL STRUCTURE

1.2.1 OVERVIEW OF ORGANISATION AND OPERATION

Advanced Aviation Training is a private company fully owned by the Directors.

Advanced Aviation Training holds an authorisation to conduct Part 141 flight training.

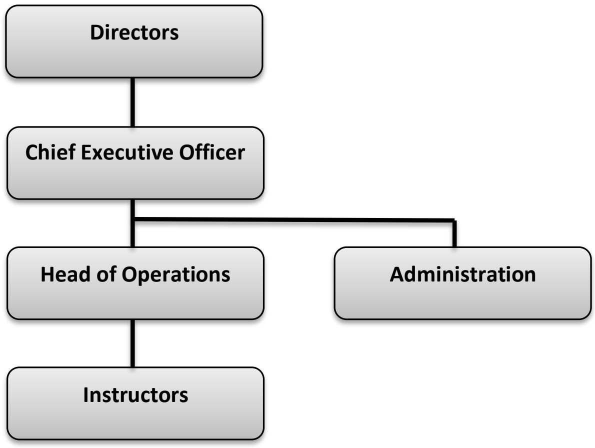
The company operates a fleet of aircraft. Instructors are employed either on a full-time, part-time or casual basis depending on demand and the level of flight training activity.

1.2.2 DESCRIPTION AND DIAGRAM

Advanced Aviation Training is governed by the Directors and they are responsible for setting and overseeing the strategic direction and policies of the organisation. The attached diagram represents the organisational structure including reporting lines.

To manage the Part 141 flight training activities, the company has the following key personnel:

- Chief Executive Officer (CEO)
- Head of Operations (HOO)


Directors
Chief Executive Officer
Head of Operations
Administration
Instructors

1.2.3 AUTHORISED PART 141 FLIGHT TRAINING ACTIVITIES

Advanced Aviation Training is only authorised to conduct Part 141 flight training for the issue of an RPL, PPL, SE, NVFR.

1.2.4 OTHER OPERATIONAL ACTIVITIES

Reserved

1.3 OPERATIONAL HEADQUARTERS, BASES AND FACILITIES

1.3.1 DESCRIPTION OF SCHOOL FACILITIES

The following facilities are used by Advanced Aviation Training.

Building

The school's facilities consist of a two story hanger with an office, two classrooms, kitchen, rest facilities and flight planning area.

The facility is shared with "Bob Tait's Aviation Theory school" and their operation of business is to be respected at all times.

There are multiple computers. Each computer is installed with current applications, used for managing day-to-day operations of the business, recording flight training operations and managing rosters and flight and duty times.

The computers are all connected to the internet and print services via the network.

Office

This building is used for company administration and the management of flight operations. The room contains:

- CEOs office
- Head of Operations (HOOs) office
- locked filing cabinet for exam results and student flight training records.
- book shelf for student log books

Administration

Office front counter for payment of accounts and ordering training manuals and hardware.

Hangar Bottom floor

This area contains the operations Room where flight planning and where flight plans are submitted, with the following briefing equipment:

Large desks used to prepare flight plans, computer with internet access to NAIPS and BOM notice board.

Topographical map of the training area, planning chart Australia (PCA), the relevant Visual Navigation Chart (VNC) for geographical location, safety and aviation relevant posters

small scale maps for Navex routes

Large bookcase for the company's reference library.

kitchen

Instructor's lounge

Toilets

Class rooms

These rooms are used for conducting training, briefing and examination activities. The building contains:

- two classrooms; each accommodating up to 10 students equipped for training and briefing including:
  - desks
  - large whiteboard
  - instructional aids, including aircraft model and cockpit posters

1.3.2 CARE AND MAINTENANCE OF FACILITIES

All training facilities and classrooms must be kept clean, tidy and in good repair. Any instructor using a briefing facility is responsible for ensuring that it's left clean and tidy. Defects or faults in equipment should be reported to the HOO as soon as possible.

1.3.3 REVIEW OF FACILITIES

A regular audit of the facilities and resources is conducted by the HOO to ensure the training facilities are adequate (refer section 1.11.3).

Any issues identified must be recorded on form 4B02 (Audit of Compliance & Facilities), under the 'what improvements can be made?' section. The CEO must be notified immediately by email with a request for funding or other requirement to address the identified issue.

1.3.4 TEMPORARY LOCATIONS

Where flying training activities are required to be conducted at a different location than home base the following matters must be considered:

- instructor familiarity with aerodrome and procedures
- aerodrome suitability for the task, check NOTAM and weather
- suitable briefing area or facilities for the training are available
- access is available to briefing material (possibly iPad)
- communication with the operational headquarters is available

1.4 KEY PERSONNEL

1.4.1 CHIEF EXECUTIVE OFFICER (CEO)

CEO Name: Maree Reddish
Standby CEO Name: RESERVED

The CEO is responsible for discharging the following duties:

1. Review the planned kind and volume of training, including:
   A. consulting with the HOO to determine the number and qualifications of instructors required to safely and effectively complete the anticipated flight training
   B. on at least a yearly basis or at major changes to operations, review the suitability of the company's management structure
   C. ensuring that training resources can be provided to deliver the anticipated flight training.
2. Ensure that the HOO has:
   A. reviewed recent flight training records and taken necessary corrective action where appropriate in accordance with (IAW) section 3.4.2.3
   B. carried out the audits IAW section 1.11
   C. carried out appropriate corrective action on all deficiencies identified at audits and submitted the details are on form 4B02
   D. Monitored standards of training IAW section 1.12
3. Carry out the continuous improvement process described in section 1.6.4.1 in conjunction with the HOO. Review the Operations Manual and apply the change management procedures described in section 1.10.
4. At least yearly, regularly review key personnel performance by:
   A. checking their conduct is IAW the Operations Manual and civil aviation legislation
   B. entering the outcome of this assessment on the person's file
   C. taking appropriate action where unsatisfactory performance is identified.

Note: While the CEO may delegate any of the duties listed above to suitably qualified, trained and competent personnel, the responsibility and accountability remains with the CEO.

1.4.2 HEAD OF OPERATIONS (HOO)

HOO Name: Paul Reddish
Standby HOO Name: N/A

Mandatory qualifications

The HOO must hold the following current qualifications that are the minimum requirements prescribed by legislation:

- commercial pilot licence with aeroplane category rating – CPL(A)
- single engine class rating
- flight instructor rating with Grade 1 aeroplane, night VFR
- night VFR Rating with an aeroplane night VFR endorsement.

Desirable qualifications and experience

Information: Additional attributes are in excess of regulatory requirement

In addition to the mandatory requirements listed above, Advanced Aviation Training prefers that the appointed HOO have the following experience, capabilities and skills:

- 12 months experience exercising the privileges of a Grade 1 training endorsement
- ability to communicate effectively in writing and verbally
- able to plan for and monitor the use of training resources and to conduct training activities
- able to supervise and mentor personnel
- ability to apply competency-based training principles and safety principles to pilot training and aircraft operations
- sound knowledge of CASR Part 61 flight crew licensing legislation and CASR Part 141 flight training legislation.

Duties

The HOO is responsible for discharging the following duties:

1. Verify that instructors have received the latest version of the Operations Manual IAW section 1.6.
2. Maintain the reference library and access to publications, information and data IAW section 1.8.3.
3. Action the change management process IAW section 1.10 when changes are required.
4. Review compliance and facilities by:
   A. conducting internal audits IAW section 1.11 on at least an annual basis
   B. review audit findings
   C. taking any necessary corrective action to rectify deficiencies as soon as possible.
5. Identify and address deficiencies IAW sections 1.12 and 3.4.2.5, in:
   A. training outcomes
   B. pre-flight test assessments
   C. feedback from flight tests.
6. Supervise instructors IAW with the procedures in section 1.13.1.2.2.
7. Review scheduling and rostering of instructors to ensure rostering and fatigue management IAW the procedures described in section 1.14.
8. Manage induction training IAW section 3.1.1.
9. Manage the instructor standardisation program IAW section 3.2 and verify standardisation and proficiency checks are up to date.
10. Manage the DAMP IAW Appendix 4.1.2.
11. Maintain up-to-date records of the qualifications of instructors using form 4B10.
12. Schedule aircraft maintenance IAW section 2.2.2

Note: While retaining responsibility, the HOO may delegate any of the duties listed above to suitably qualified, trained and competent personnel. However, the HOO may not delegate their responsibility IAW CASR 141.210 relating to flight tests. (refer to section 3.8.1).

1.4.3 KEY PERSONNEL FAMILIARISATION TRAINING

Advanced Aviation Training will nominate a trainer with suitable knowledge of relevant operational procedures to conduct familiarisation training of key personnel if necessary, before they begin to carry out their responsibilities. This training shall use the topics on form 4B04 as a guide to the material to be covered.

The person conducting the training will complete and store the key personnel familiarisation training records using form 4B04 in the individual’s personnel file as evidence of completion of training.

1.4.4 ABSENCE OR INABILITY OF KEY PERSONNEL TO CARRY OUT THEIR RESPONSIBILITIES

The Advanced Aviation Training standby CEO, Paul John Reddish will carry out the responsibilities of the CEO when the CEO cannot carry out those responsibilities.

The Advanced Aviation Training standby HOO,has not been nominated and as such Advanced Aviation Training will suspend all operations when the HOO is on leave or cannot carry out those responsibilities for any other reason until a new HOO is nominated or the existing HOO returns to duty.

1.4.5 NOTIFICATION TO CASA OF INABILITY OF A KEY PERSON TO CARRY OUT THEIR RESPONSIBILITIES

If Advanced Aviation Training becomes aware of a circumstance where a key person cannot carry out their responsibilities for more than 30 days, CASA will be notified by email and if necessary a follow up phone call, within 24 hours of becoming aware of the circumstance.

Note: Sufficient time must be allowed for the standby person to re-familiarise themselves with the duties and responsibilities of the key personnel position they are standing in for.

1.5 RESOURCES

1.5.1 REGISTERED AIRCRAFT DETAILS

A list of aircraft currently operated by Advanced Aviation Training is detailed on form 4B12 (Registered Aircraft Details). If new or other kinds of aircraft are added to the fleet, act IAW the change management process in section 1.10.

1.5.2 FLIGHT SIMULATOR TRAINING DEVICES

When required Suitably qualified Advanced Aviation Instructors will use the Bob Tait's Aviation theory school FSTD

Designated BTsim-01 Arn 562097.

Instructors will need to be instructed by the owner Bob Tait's Aviation theory school in its operation and be assigned as an Authorised instructor on page 9 of its operations manual.

The FSTD can be used for Basic instrument flight training as approved in the respective syllabus's for PPL , CPL and NVFR flight training.

It can also be used for supplementary training in addition to the syllabus requirements.

A letter of agreement for the use of this device is contained within this manual.

Letter of Agreement

Between Bob Tait's Aviation Theory School
And
Advanced Aviation Training

Bob Tait's Aviation Theory School will hire to Advanced Aviation Training the use of the following CASA approved Synthetic Trainer at a cost of $70.00 per hour, payable by the end of the month.

PFC Cat III BATD – BTSIM-01

....
Bob Tait
Director
Bob Tait's Aviation Theory School
03/08/2020

....
Paul Reddish
Director
Advanced Aviation Training
03/08/2020

1.6 OPERATIONS MANUAL ADMINISTRATION

1.6.1 OPERATIONS MANUAL DISTRIBUTION AND AVAILABILITY

The Operations Manual is maintained in electronic format; however, paper copies are provided in the office for use by instructors and students. Form 4B01 is used as a register detailing the manual's distribution. The register is kept in the company's administration files.

The manual is distributed to the personnel and entities mentioned in the following table:

Manual Holder	Electronic format	Paper format
CASA	1	
Reference Library	1	
HOO	1	
Ops Room	1	
Instructors	1	

1.6.2 ISSUING OF AMENDMENTS

Amended versions of the manual will be distributed electronically to all instructors. The HOO must provide a summary of changes contained in the amendment, including background information, details about why the changes were made and the implications for instructors and students.

On receipt of the amended version, all instructors must sign form 4B01 to indicate they have read and understood the amendments.

1.6.3 REQUIREMENTS TO COMPLY WITH THE OPERATIONS MANUAL

All Key Personnel, Instructors and students must comply with relevant instructions and procedures contained in this Operations Manual.

1.6.4 OPERATIONS MANUAL REVIEW AND AMENDMENT PROCEDURES

1.6.4.1 CONTINUOUS IMPROVEMENT PROCESS

The CEO and HOO must meet at least annually to review the effectiveness, or otherwise, of processes and procedures described in the Operations Manual.

Any identified improvement opportunities are to be actioned as appropriate using the change management process in section 1.10.

1.7 CASA EXEMPTIONS

Reserved

1.8 COMPANY REFERENCE LIBRARY

1.8.1 COMPOSITION OF REFERENCE LIBRARY

The reference library includes the following documents:

Document Name	Electronic	Paper
Advanced Aviation Training Part 141 Operations Manual	X	X
CAA 1988	X	
CASR 1998 - complete	X	
CASR Part 61 Manual of Standards	X	X
CAR 1988 - complete	X	
CAOs	X	
AIP		X
ERSA		X
CAAPs and ACs of relevance		X
AFMs or POHs - copies for each aircraft operated		X
Register of landing sites approved for use by company aircraft	X	X
Training area map	X	X
Access to flight planning websites and Airservices Australia	X	

1.8.2 ACCESS TO REFERENCE LIBRARY

All instructors and students have access to publications maintained in the reference library during normal working hours.

With the exception of the Operations Manual, the library is for reference purposes only and no publications may be removed from the company’s premises. However relevant sections including AFMs, POHs, load sheets and regulations, may be copied or printed as required, then considered as uncontrolled.

1.8.3 AMENDMENT AND MAINTENANCE OF REFERENCE LIBRARY

The HOO will review the amendment status of each item in the reference library in accordance with that documents’ amendment cycle and update it as required.

1.9 RECORD KEEPING - OPERATIONAL AND ADMINISTRATIVE

1.9.1 CONTROL

Company records fall into two broad categories:

1. Administrative records
2. Operational records

The CEO is responsible for the management of administrative records, while the HOO is responsible for the management of operational records.

1.9.2 RECORDS AND RETENTION PERIODS

1.9.2.1 ADMINISTRATIVE RECORDS

Record	Electronic Format	Paper format	Storage Location	Retention Time	Disposal Method
General administrative correspondence			Management file		Shred
Internal audit records			Audit file		Shred
Continuous improvement			Management file		Shred
Incident and accident reports			Safety file		Shred
DAMP testing program records			DAMP file	5 years	*Shred / delete
Personnel records			Management file		Shred

*DAMP records for alcohol and drug testing will be retained for a maximum of 5 years. During the 6 month period following this retention time the records will be destroyed or the sections related to AOD testing will be deleted or destroyed.

1.9.2.2 OPERATIONAL RECORDS

Record	Electronic Format	Paper Format	Storage Location	Retention Time	Disposal Method
Instructor records - Personnel induction records			Personnel records		Shred
Instructor records - Standardisation & proficiency checking			Personnel records		Shred
Instructor records - Instructor qualifications			Personnel records		Shred
Student personnel records			Ops Room		Shred
Student flight training records			Student files	7 years	Shred
Student flight test reports			Student files		Shred
Flight examiner reports			HOO files		Shred
Flight authorisation sheets			Operations files		Shred
Crew flight & duty records			HOO files	10 years	Shred
Aircraft fuel consumption records			Operations files		Shred
Aircraft maintenance records			Maintenance files		Retain

1.9.2.3 REQUESTS FOR RECORDS MADE BY CASA

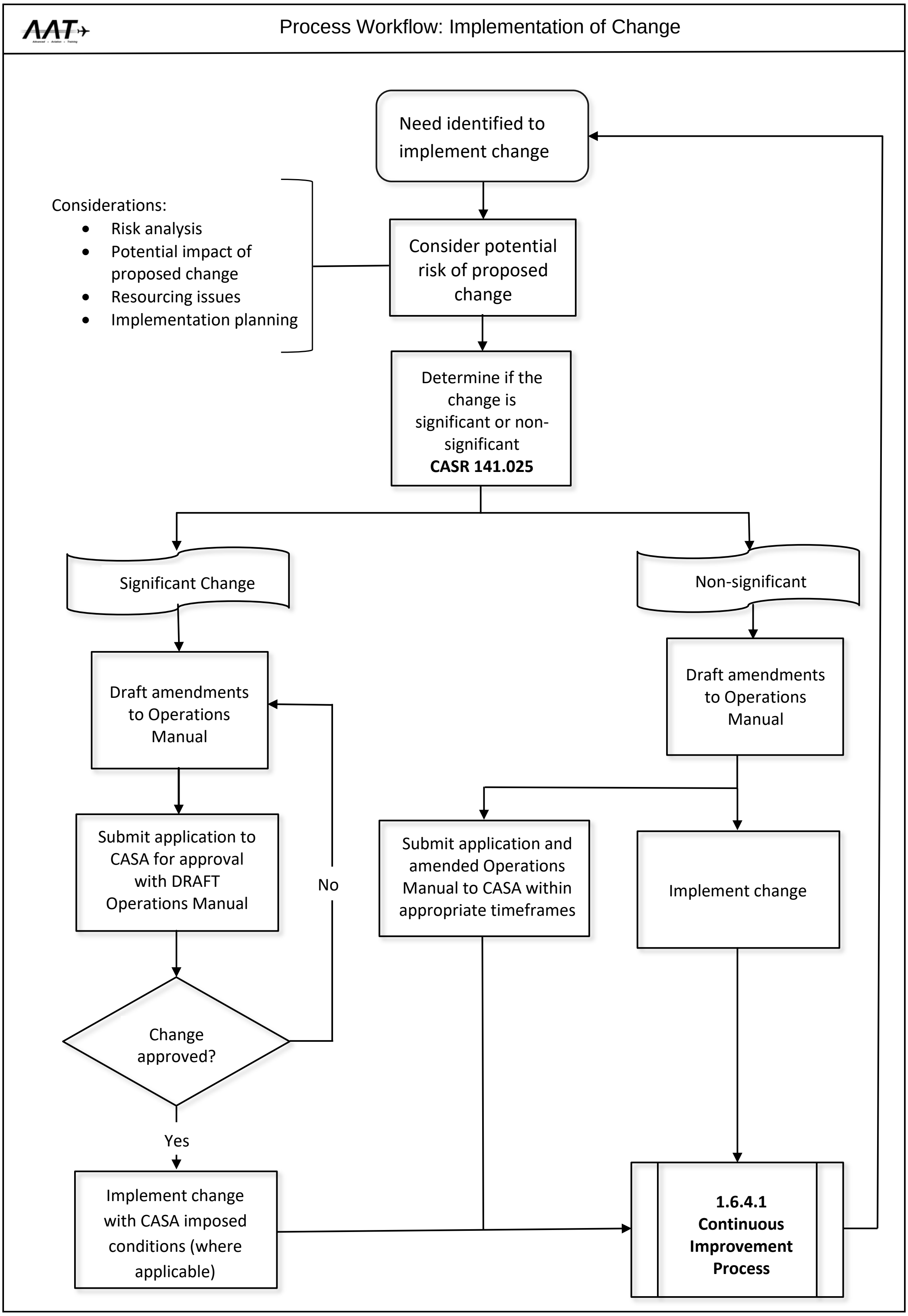
A request from CASA to surrender documents shall be handled by the CEO. The CEO must do the following:

1. File the request in the company administration file titled CASA requests.
2. Action the request within the timeframe specified in the request.
3. Make a copy of the response and CASA receipt and attach it to the same file.

1.10 CHANGE MANAGEMENT

Changes to company operations, policies or procedures are made under the direction of the CEO IAW this section.

1.10.1 CHANGE MANAGEMENT PROCESS



1.10.2 ACTIONING THE CHANGE MANAGEMENT PROCESS

When actioning a proposed change, the CEO, in consultation with the HOO, must follow the change management process flow in section 1.10.1 using the methodology outlined below.

- verify the need for change with reference to the following change instigators:
  - new regulatory requirement
  - non-compliance notice (CASA)
  - audit observation (CASA)
  - CASA direction IAW *CASR 141.100*
  - continuous improvement process
  - new business opportunities or new or different kinds of aircraft
  - internal audit results
  - change of key personnel.
- assess the risks of the proposed change considering at least, but not limited to:
  - resource requirements
  - compliance considerations
  - urgency of change
  - implementation implications and strategy
  - impact on safety.
- the HOO will draft an operations manual amendment with details of the proposed change
- the CEO will refer to *CASR 141.025* to determine if the change is significant or non-significant
  - if the change is significant, proceed IAW section 1.10.3
  - if a change is not significant, proceed IAW section 1.10.5.

1.10.3 PROCESS FOR SEEKING APPROVAL OF A SIGNIFICANT CHANGE

A significant change requires CASA approval. The CEO, in consultation with the HOO, will prepare and dispatch a written application to CASA for approval of the change including details of the change and a draft copy of the amended Operations Manual. The HOO will deal with CASA in relation to the approval process for the amended Operations Manual.

When the change is approved, proceed IAW section 1.10.5.

1.10.4 CHANGE OF KEY PERSONNEL

Changes of key personnel are defined as a significant change. After the company appoints the new key person the CEO will send an application to CASA for approval:

- within 7 days of the new appointment if the new appointee is named in the Operations Manual as the standby person
- within 3 days of the new appointment if the new appointee is not named in the Operations Manual as the standby person.

Once approved, an amended Operations Manual must be issued showing the new key person appointment, including conditions imposed by CASA (if any).

An electronic copy of the manual must be distributed to instructors IAW section 1.6.

1.10.5 PROCESS FOR IMPLEMENTING CHANGE

The process for implementing a significant or non-significant change is:

1. Obtain CASA approval of the change if required
2. The HOO will issue the amended operations manual IAW section 1.6
3. The HOO will review the operation of the change within 3 months of the change taking effect to assess its ongoing effectiveness and suitability.
4. To determine the long-term implications of any changes, the HOO will action the continuous improvement process IAW section 1.6.4.1.

1.10.6 CHANGES OF NAME, CONTACT DETAILS AND ADDRESSES

Before any change is made, the CEO will notify CASA in writing of the changes. This notification will include a copy of the proposed amendment to the Operations Manual with changes highlighted.

After CASA has been notified, the relevant amendment to the Operations Manual may be affected by the CEO and a new version of the manual distributed IAW section 1.6.1.

1.11 INTERNAL AUDIT PROCESSES

1.11.1 OPERATIONS MANUAL COMPLIANCE

Annually or when required, the HOO will carry out a compliance audit using form 4B02 on a representative sample of processes and procedures against the requirements in the Operations Manual.

This sampling process will review at least:

- Certifications of receipt of the current operations manual by all Key Personnel and Instructors
- aircraft flight times, student log books and flight training records for consistency
- student solo authorisations to ensure they have been carried out correctly
- student flight training records, including instructor comments, to ensure they are up-to-date and compliant with training syllabuses
- examination papers are up to date, relevant and secure
- fuel records to verify appropriate published consumption rates are being achieved.
- Aircraft journey log complete

1.11.2 REGULATORY COMPLIANCE

Annually or when required, the HOO will carry out a compliance audit using form 4B02 on training operations against the requirements of civil aviation legislation.

This audit will review at least:

- flight and duty records for accuracy and compliance
- records of instructor standardisation and proficiency checks, recency, medical certifications and qualifications
- recency of drug and alcohol management plan (DAMP) eLearning
- maintenance releases and aircraft flight records (flight authorisation sheet) for consistency

1.11.3 FACILITIES AND RESOURCES

Annually or when required, the HOO will carry out an audit of the facilities and resources, to determine at least:

- a roster of sufficient suitably qualified instructors to deliver flight training to current and projected students for the next period
- the presence of sufficient suitable aircraft available for the delivery of flight training to current and projected students for the next period
- training aids and other physical resources required to deliver flight training to current and projected students for the next period are sufficient and in good condition
- if any repairs or maintenance are required and carried out.

The HOO will report to the CEO using form 4B02. If additional resources are needed the HOO will inform the CEO and obtain the additional resources as required.

1.12 MONITORING STANDARDS OF TRAINING

On a quarterly basis, the HOO will:

- compare average student hours at the completion of each licence level between the current period and previous periods
- monitor training by conducting training flights with a representative sample of students in various stages of training to assess their actual performance against expected performance
- compare flight training records and course syllabuses to identify any patterns of training deficiencies in accordance with section 3.4.2.3
- review pre-flight test assessments and examiners' flight test reports for evidence of training deficiencies.
- review student progress for students trained exclusively by Instructors holding a Grade 3 training endorsement, or after 15 flight training hours have been completed.

The HOO will regularly report to the CEO confirming that the standards of training are being maintained, and that corrective action (if required) is being taken.

1.13 OPERATIONAL PERSONNEL

1.13.1 DUTIES AND RESPONSIBILITIES

1.13.1.1 DESIGNATION AND RESPONSIBILITIES OF THE PILOT IN COMMAND

For all flights operated by Advanced Aviation Training, one pilot shall act as pilot-in-command (PIC). In the case of dual training flights, the flight instructor will act as PIC, while for solo training flights the student will act as PIC. In the case of a flight test, the Flight Examiner will be PIC IAW the Flight Examiner Handbook requirements.

The PIC shall be responsible for ensuring compliance with *CAR 224*.

1.13.1.2 FLIGHT INSTRUCTOR RESPONSIBLITIES

Flight instructors are responsible to the HOO for:

- the safe and efficient conduct of their allocated student's dual and solo flying training and the generation and maintenance of associated flight training records
- the checking of flight times against aircraft records and, if necessary, correction of the pilot log books of their allocated student's
- ensuring that daily inspection certifications are entered into the maintenance releases
- ensuring that flight times are correctly entered into the maintenance releases at the completion of each days flying
- the accurate completion of company flight and duty time records (form 4B11)
- ensuring that only authorised training is performed and that it is conducted IAW this Operations Manual and the Part 141 certificate.

1.13.1.2.1 FLIGHT INSTRUCTORS AUTHORISED TO APPROVE AND SUPERVISE SOLO FLIGHTS

The HOO will use form 4B10 to maintain a register of the training that each instructor is authorised to conduct and their Part 61 training endorsements. This form includes an authorisation by the HOO for the instructor to send students on their first solo flight.

The responsibilities and duties of a flight instructor authorised to approve and supervise solo flights are listed under section 3.4.1.1.

1.13.1.2.2 SUPERVISION OF FLIGHT TRAINING ACTIVITIES AND JUNIOR INSTRUCTORS

The HOO will nominate an instructor holding a Grade 1 training endorsement (the 'supervising instructor') to be rostered for duty on days when the HOO is rostered off duty to supervise flight training activities. This includes the supervision of flight instructors who only hold a Grade 3 training endorsement.

Company policy for instructor supervision

To effectively supervise an instructor holding a Grade 3 training endorsement, the HOO or the supervising instructor must:

- be at home base or contactable by electronic means if away from the aerodrome for short periods of time
- be flying within the training area or on a navex and contactable by radio or other electronic means
- be available to provide advice and guidance to the Grade 3 instructor.

Supervising instructor related duties

1. Review the planned training for the day and ensure that the weather conditions are suitable to allow successful lesson outcomes. The supervising instructor must consider the latest information relevant to the training area, navex routes and any intended landing points. Where available the information to be considered includes:
   A. area forecasts
   B. Terminal Aerodrome Forecasts (TAFS) and METAR
   C. NOTAMS.
2. Where possible, the supervising instructor will observe briefings and lesson conduct, student interactions and record keeping, and compliance with civil aviation legislation.
3. If a scheduled flight lesson has to be changed for any reason, the supervising instructor will determine whether the revised lesson may take place.

1.13.2 GROUND INSTRUCTORS

Reserved

1.14 ROSTERING AND FATIGUE MANAGEMENT

1.14.1 COMPANY ROSTERING PROCEDURES

The HOO is responsible for developing rosters that meet the requirements of Appendix 1 of CAO 48.1 with sufficient advance notice, usually a week. Full-time instructors will be allocated set days in which they will be expected to work. Regardless of the start and finish times for the day, the HOO will ensure there are sufficient off-duty periods between duty days.

As much notice as possible will be given to part-time instructors and where possible an email will be sent specifying the days, hours and lesson required.

The roster may be changed at short notice as required to respond to operational needs. The roster will be published electronically.

The HOO will ensure when preparing the roster for instructors that the following limitations and considerations are taken into account:

- an instructor must have had at least 8 hours sleep opportunity in the previous 12 hours before rostering a flight duty period (FDP)
- FDP restrictions:
  - FDP must be contained between:
    - the hours of 0700 or the beginning of morning civil twilight (whichever is earlier); and
    - 0100 hours the following day
  - Max FDP is 8 hours if commencing prior to 0600 hours
  - Max FDP is 9 hours if commencing between 0600 and 1400 hours
  - Max FDP is 8 hours if commencing on or after 1400 hours
  - Max flight time in an FDP is 7 hours
  - Maximum of 3 FDP's in any 168 hour period if finishing after 2200 hours. An extension finishing after 2200 hours does not count.
- an instructor must have a minimum off-duty period of at least 12 consecutive hours during any consecutive 24 hour period
- an instructor must have a minimum of 2 days off-duty during any consecutive 7 day period
- the cumulative flight time accrued by an instructor during any consecutive 28 day period must not exceed 100 hours
- the cumulative flight time accrued by an instructor during any consecutive 365 day period must not exceed 1000 hours.

The HOO must use form 4B10, to ensure that an instructor is assigned to flight training duties only if they meet following requirements:

- holds a valid instructor proficiency check (FPC)
- holds a valid instructor standardisation and proficiency check (S&P)
- holds a current Class 1 Medical Certificate
- the flying currency requirements have been met
- holds appropriate qualifications for the duty.

1.14.1.1 FLIGHT AND DUTY TIME RECORDS

Each instructor will ensure that form 4B11 *(CAO 48.1 – Flight Crew Member Flight & Duty Record)* is updated at the conclusion of each FDP.

1.14.1.2 FLIGHT AND DUTY TIME EXTENSIONS

If an extension is required, the following requirements must be met:

- the FDP has commenced
- unforeseen operational circumstances arise
- an extension of the FDP is operationally necessary to complete the duty
- the instructor considers himself or herself fit for the extension
- any extension must not exceed 1 hour of duty or 30 minutes of flight time beyond limits specified in this manual
- no extension will end later than 0100 hours
- If there is a FDT extension the HOO will record the reasons for it and details of the FDT extension in the continuous improvement program for future analysis to help develop measures to avoid a similar extension being needed in the future

1.14.2 FATIGUE MANAGEMENT

1.14.2.1 POLICY

It is a joint company and pilot responsibility to ensure that flight and duty times are not exceeded, and that fatigue is managed appropriately. Whilst the company will roster IAW *Appendix 1 of CAO 48.1*, it is essential that instructors maintain an awareness of their state of fatigue. If an instructor considers their ability to perform their duties is being affected by fatigue, they must alert the HOO.

It is expected that as professional pilots, instructors will endeavour to manage their fatigue responsibly. There will be occasions, however, where unexpected events or circumstances may adversely affect an individual's ability to do so.

Each instructor may conduct a self-assessment of their state of fatigue before and during an FDP. This is apart from any recommended duty period and flight time limits set out in this fatigue management policy.

Any instructor who assesses themselves as being too fatigued must inform the HOO and not undertake their FDP. No disciplinary action will be taken against any instructor who makes such a decision as outlined in this policy.

1.14.2.2 SELF-ASSESSMENT TOOL

When conducting a self-assessment, instructors are encouraged to use a self-assessment method such as the 'I'M SAFE' tool. This tool incorporates more than just physical tiredness; it considers many other factors that may affect the ability of an instructor to safely discharge their duties. If any doubt exists, instructors should discuss the matter with the HOO or other instructors.

1.14.2.3 I'M SAFE SELF ASSESSMENT

I'M SAFE:

- (I) llness – Are you suffering from any illness or symptom of an illness which might affect you in flight?
- (M) edication – Are you currently taking any drugs (prescription or over-the-counter)? Are they affecting you?
- (S) tress – Are there any psychological or emotional factors which might affect your performance?
- (A) lcohol – Has there been at least 8 hours between your last alcoholic drink and the commencement of your FDP?
  - Is it likely that your blood alcohol concentration exceeds 0.02%?
  - Are you in any way affected by alcohol (including a hang-over)?
- (F) atigue – Have you had sufficient sleep and rest in the recent past?
- (E) ating – Are you well fed and hydrated? (low blood sugar or dehydration leads to poor decision making and degraded reaction times)

1.14.2.4 HOO RESPONSIBILITIES

The HOO should consider specific circumstances likely to increase fatigue risk relating to individual instructors.

Circumstances may include:

- part-time instructors and casual employees who have additional employment
- a significant personal event.

If the HOO becomes aware that an instructor has specific circumstances that may increase their fatigue risk, they must discuss those circumstances to determine their impact on the instructor's state of fatigue. The purpose of this discussion is to evaluate if the instructor will be sufficiently rested to accept the FDP assignment.

Strategies to decrease fatigue risk include, but are not limited to:

- a delayed start to the duty
- duty rotation with another instructor
- additional planned breaks during the duty.

1.14.2.5 SUSTENANCE

Low blood sugar levels and dehydration impair brain function and lead to poor decision-making. Instructors and students are encouraged to take regular meal breaks, eat nourishing food and drink sufficient quantities of water. In addition, instructors should consider breaking up long navigational exercises at an enroute aerodrome to take advantage of a meal break. If a FDP is to exceed 5 hours, an opportunity to consume a meal must be available to the instructor and student during the first 5 hours.

1.14.3 MEDICAL

1.14.3.1 MEDICAL CERTIFICATES

The following procedures apply:

1. Each flight instructor must hold a current Class 1 medical certificate.
2. At the first available opportunity after being revalidated by a designated aviation medical examiner (DAME), a flight instructor must give a copy of the revalidated medical certificate to the HOO. The HOO will then update the company register of instructor qualifications using form 4B10.
3. At the first available opportunity after receiving their medical certificate from CASA, a flight instructor must give a copy of the revalidated medical certificate to the HOO. The HOO will then update the company register of instructor qualifications using form 4B10.
4. The HOO must keep a copy of the instructor’s medical certificate in the instructor’s personal file.

1.14.4 DRUG AND ALCOHOL MANAGEMENT

Instructors are prohibited from performing flight training duties or responsibilities when under the influence of alcohol or drugs.

Advanced Aviation Training has elected to adopt the CASA Micro-business DAMP in order to obtain the benefits of the current CASA Micro-business exemption which exempts an eligible DAMP organisation from certain compulsory requirements of *CASR Subpart 99.B*.

By adopting the CASA Micro-business exemption, Advanced Avation Training has committed to adhering to all of the requirements outlined under the *DAMP exemption for micro-business*, as stated on the CASA website under the 'Exemptions' section of the CASA *Drug and alcohol management plans* link.

Advanced Aviation Training adopts all conditions in the CASA Micro-business exemption including completion of the CASA AOD eLearning by all staff who perform SSAA, and has formally adopted the Micro-business DAMP.

CASA Micro-business Drug and Alcohol Management Plan (DAMP)

Note This DAMP must be adopted as follows by a micro-business to obtain the benefit of *CASA EX81/20 — Implementation of Drug and Alcohol Management Plans (Micro-businesses and DAMP organisations) Exemption 2020.* It is a condition of the exemption that the CASA Micro-business DAMP be adopted in this way — see ss6(4) of CASA EX81/20.

Advanced Aviation Training

adopts this DAMP as its DAMP.

1091366

Maree Fay Reddish

CEO

On behalf of Advanced Aviation Training

DATE 27/07/2020

Version Number 5
Date: 1 June 2020

The DAMP for our micro-business

This is the drug and alcohol management plan (***DAMP***) for the micro-business

Advanced Aviation Training

to obtain the benefit of CASA EX81/20 (the ***CASA exemption***) which exempts Australian micro-businesses from the requirements of Subpart 99.B of the *Civil Aviation Safety Regulations 1998* (***CASR***).

> Note: CASR and *CASA EX81/20 — Implementation of Drug and Alcohol Management Plans (Micro-businesses and DAMP organisations) Exemption 2020* are available from the Federal Register of Legislation at https://www.legislation.gov.au.

We confirm that we consider Advanced Aviation Training

to be a micro-business as defined in the CASA Exemption.

Our DAMP contact officer

Our DAMP contact officer will liaise with CASA in relation to our organisation's responsibilities under Part 99 of CASR.

DAMP contact officer details

Name: Maree Reddish

Phone: 407583388

Email: Reddishm@bigpond.com

We understand that we must provide these details of our DAMP contact officer to our CASA regional office within the timeframes as set out for their micro-business in CASA EX81/20, in the CASA approved form.

> *Note* Form 008 has been approved for this purpose and is available on the CASA website at https://www.casa.gov.au.

Our DAMP supervisor(s)

Our DAMP supervisor is authorised by our organisation to form an opinion as to whether a SSAA employee may be adversely affected by drugs or alcohol.

We may have more than one SSAA employee nominated as a DAMP supervisor.

DAMP supervisor details

Name: Paul Reddish

Phone: 419177102

Email: reddishaviation@gmail.com

Additional DAMP supervisor details

Name: Additional Supervisor Name

Phone: 1234567890

Email: Additional Supervisor Email

1. Definitions

Unless otherwise stated, terms and expressions used in this micro-business DAMP have the same meanings as in Part 99 of CASR, including ***applicable SSAA, DAMP or drug and alcohol management plan, DAMP contact officer, DAMP supervisor, SSAA***.

Special definitions

For this micro-business DAMP:

micro-business employee is an employee of the micro-business who is not a person who has a contract of service or a contract for service with another organisation to provide DAMP organisations generally with generic SSAA.

SSAA employee means a micro-business employee who is performing SSAA for our business.

Note Regulation 99.010 of CASR defines SSAA as meaning a safety-sensitive aviation activity.

regular SSAA employee means an SSAA employee who is reasonably likely to perform an applicable SSAA at least 2 or more times every 90 days, for the micro-business.

applicable SSAA has the same meaning as in regulation 99.010. of CASR.

Note These include, for example, maintenance, baggage handling, security, fuelling, flight, or things done "airside", that is on the surface of a certified or registered aerodrome or on an aircraft on such an aerodrome.

generic SSAA means the SSAA mentioned in the following paragraphs of regulation 99.015 of CASR: (e), (f), (h), (i), (j), (k) and (l).

Note In general terms, these relate to aircraft refuelling, airport security, aircraft baggage handling, air traffic control, flight information and search and rescue alert services, and aerodrome fire fighting. The effect of this definition and the definition of *micro-business* employee, for a micro-business, is that persons providing SSAA services, other than those defined as generic SSAA, must be counted as employees of the micro-business.

2. Micro-business — 10 SSAA employees

We are a micro-business for the exemption because we are a DAMP organisation that does not have, at any time, and under any circumstances, more than 10 micro-business employees who are reasonably likely to perform, or available to perform, an applicable SSAA for our business. We are also not engaged in and do not provide services to, any regular public transport operation.

2.1 What happens if we have more than 10 SSAA employees

We recognise that if, at any time, we have more than 10 micro-business employees performing, or available to perform, an applicable SSAA for our micro-business, the CASA exemption no longer applies to us and we must comply in full with Subpart 99.B of CASR.

If, at any time, we do have more than 10 micro-business employees performing, or available to perform, an applicable SSAA for our micro-business, we will comply with all the requirements and the obligations set out in Subpart 99.B of CASR.

We recognise that those obligations are significantly different in some respects from our obligations under this micro-business DAMP because of the relief otherwise provided by the CASA exemption.

3. CASA random drug and alcohol testing unaffected

We recognise that the CASA exemption does not extend to Subpart 99.C of CASR under which CASA conducts random drug and alcohol testing.

4. Implementing our CASA micro-business DAMP

1. We will make our micro-business DAMP available to our SSAA employees.
2. We will encourage each of our SSAA employees to inform the micro-business DAMP supervisor if they believe that they have consumed a level of alcohol or are taking any drug (this includes prescription and over-the-counter medication) that may affect his or her safe performance of SSAA.
3. We will tell each of our SSAA employees that if they consume a level of alcohol or take any drug that may affect the safe performance of their SSAA duties, they must not perform, or be available to perform, such SSAA duties.
4. If an employee has performed, or is in the act of performing, SSAA duties and we believe the SSAA employee has consumed a level of alcohol or taken any drug that may affect the safe performance of their SSAA duties, we will take all appropriate measures to protect the safety of our SSAA operations.
5. An SSAA employee of our micro-business will not be permitted to perform, or be available to perform, an applicable SSAA for our micro-business unless and until he or she has completed the CASA eLearning. Within thirty months of completing the CASA eLearning, an SSAA employee of our micro-business will not be permitted to perform, or be available to perform, an applicable SSAA for our micro-business unless and until he or she repeats the CASA eLearning. For this purpose, our organisation will use the CASA online drug and alcohol education program (CASA eLearning) available on the CASA website.
6. Our micro-business DAMP supervisor/s will not be permitted to perform this role for our micro-business unless and until he or she has completed the same CASA eLearning as an SSAA employee, and also completed the further CASA eLearning for DAMP Supervisors. Within thirty months of completing the CASA eLearning, our micro-business DAMP supervisors will repeat the CASA eLearning. For this purpose, the company will use the CASA online drug and alcohol education program (CASA eLearning) available on the CASA website.
7. We will keep a record of:
   - all SSAA employees and micro-business DAMP supervisors who have completed the CASA eLearning;
   - the employee's name;
   - the date the CASA eLearning was completed; and
   - the date that the CASA eLearning will be repeated.

5. How we will react if the DAMP supervisor has reasonable grounds to believe a SSAA employee is affected by drugs or alcohol

1 If, when they are performing or being available to perform an applicable SSAA, any of our SSAA employees is reasonably suspected by our DAMP supervisor of being adversely affected by a testable drug or by alcohol, we will immediately cease the employee from all applicable SSAA duties, until the employee is drug and alcohol **tested by a competent person using serviceable testing equipment** and each of the test results is not a positive result.

2 If a competent person is not available to conduct testing, or serviceable testing equipment is not available, a registered medical practitioner nominated by us should certify that the employee is fit to perform, or can be made available to perform, applicable SSAA.

3 If a registered medical practitioner is not available, at least 32 hours must have passed since the reasonable grounds first arose, and we must be satisfied that the SSAA employee is not a risk to aviation safety.

6. How we will react if any of our SSAA employees is involved in an accident or serious incident

1 If, when they are performing or being available to perform an applicable SSAA, any of our SSAA employees is involved in an accident or serious incident, we will immediately cease the employee from all applicable SSAA duties until the employee is drug and alcohol **tested by a competent person using serviceable testing equipment** and each of the test results is not a positive result.

2 If a competent person is not available to conduct testing, or serviceable testing equipment is not available, a registered medical practitioner nominated by us should certify that the employee is fit to perform, or can be made available to perform, applicable SSAA.

3 If a registered medical practitioner is not available, at least 32 hours must have passed since the reasonable grounds first arose, and we must be satisfied that the SSAA employee is not a risk to aviation safety.

7. Tested by a competent person using serviceable testing methods

In the previous paragraphs, the expression ***tested by a competent person using serviceable testing equipment*** means this:

> Tested by a registered medical practitioner, a qualified nurse or a trained collector, trained in the proper use of any reputable, commercially available, urine or oral fluid testing equipment (for drugs) or breath testing equipment (for alcohol), so that the testing is carried out using that equipment in accordance with the equipment manufacturer's approved testing methods.

This includes testing that might be done on one of our SSAA employees (including contractors) by us and use reputable, commercially available, testing equipment that is to be used as per the manufacturer's instructions.

8. Positive test results

An SSAA employee may give a positive drug or alcohol test result in different circumstances, for example:

1 under our own drug and alcohol testing program; and

2 under another organisation's drug and alcohol testing program (if we properly become aware of it); and

3 under Subpart 99.C of CASR under which CASA conducts random drug and alcohol testing.

9. How we will react to a positive test result for any of our SSAA employees

If, for any of our SSAA employees, we become aware of any positive test result for a confirmatory drug test or a confirmatory alcohol test, we will not permit the SSAA employee to perform, or be available to perform, an applicable SSAA for our micro-business unless one of the following events happens first:

1 a CASA medical review officer, or DAMP medical review officer, or a registered medical practitioner, has determined that the positive result could have been caused by medical treatment or another innocent cause and is not an aviation safety risk;

2 a CASA medical review officer, or a DAMP medical review officer, or a registered medical practitioner nominated by us, considers that the SSAA employee:

(a) has undergone an assessment for drug or alcohol use (which may include an assessment carried out by a registered medical practitioner nominated by us); and

(b) has received a negative test result for a confirmatory drug test or a confirmatory alcohol test; and

(c) is considered fit to perform, or be available to perform, an applicable SSAA for us.

10. How we will react if testing is refused or interfered with by any of our SSAA employees

If, for any of our SSAA employees, we become aware that the SSAA employee was required to take a drug or alcohol test and refused to take the test, or interfered with the integrity of the test, we will not permit the SSAA employee to perform, or be available to perform, an applicable SSAA for our micro-business until:

1 a CASA medical review officer, or a DAMP medical review officer, or a registered medical practitioner nominated by us, considers that the SSAA employee:

(a) has undergone an assessment for drug or alcohol use; and

(b) has received a negative test result for a confirmatory drug test or a confirmatory alcohol test; and

(c) is considered fit to perform, or be available to perform, an applicable SSAA for us.

2 In this circumstance ***required*** means required by law, or by us, or by CASA, or by the person's other employer (for example, if our SSAA employee is a contractor to us but employed by another person who properly conducted a drug and alcohol test).

11. SSAA employees who are on contract to us from *a DAMP organisation*

For this section, a ***DAMP organisation*** means a DAMP organisation under Subpart 99.B of CASR, **other than** another micro-business which is acting with the benefit of the CASA exemption.

If 1 of our SSAA employees is a contractor to us, provided to us by **a DAMP organisation**, then if reasonable grounds arise, or if there is an accident or serious incident, we will immediately notify the contact officer of that DAMP organisation.

We will immediately cease the employee from all applicable SSAA duties, until the employee is drug and alcohol tested by the DAMP organisation and each of the test results was not a positive result.

We recognise that it is a responsibility of that DAMP organisation to test the employee in accordance with that organisation's DAMP.

12. SSAA employees who are on contract to us from another micro-business

If 1 of our SSAA employees is a contractor to us, provided to us by **another micro-business with a CASA micro-business DAMP**, then if reasonable grounds arise, or if there is an accident or serious incident, we will immediately notify the contact officer of that other micro-business.

We will immediately cease the employee from all applicable SSAA duties, either:

1 until the employee is drug and alcohol tested under the other micro-business's micro-business DAMP and each of the test results is not a positive result; or

2 until:

(a) the employee is drug and alcohol tested by a competent person using serviceable testing equipment and each of the test results is not a positive result; or

(b) if a competent person is not available to conduct testing, or serviceable testing equipment is not available, a registered medical practitioner nominated by us certifies that the employee is fit to perform, or can be made available to perform, applicable SSAA; or

(c) if a registered medical practitioner is not available, at least 32 hours have passed since the reasonable grounds first arose, and we are satisfied that the SSAA employee is not a risk to aviation safety.

The expression **tested by a competent person using serviceable testing equipment** is defined above.

We recognise that nothing in this micro-business DAMP restricts, or is intended to restrict, our legal right as an employer or a contractor to terminate the employment or the contract for behaviour that is in serious breach of our employee's or our contractor's legal obligations to us in relation to the risks associated with the misuse of drugs and alcohol by SSAA employees.

13. Reporting to CASA

Under exemption CASA EX143/17 (or a subsequent renewal as published by CASA), our organisation is not required to report test records bi-annually to CASA.

14. Record keeping

We will keep the records that would have enabled us to comply with the reporting requirements that would have otherwise been applicable for 5 years from the date the information would have had to be provided to CASA.

15. CASA requests to provide information and directions to change

We will, on CASA's written request, provide CASA with any information, documents or records required by CASA for the purpose of conducting any audit of the use of our micro-business DAMP in our micro-business.

If our organisation receives a notice from CASA to adopt a new version of the micro-business DAMP, we will do so within 28 days of receiving the notice. Our organisation agrees to receive this notification electronically, by email to our DAMP contact officer at the address provided.

1.15 SAFETY POLICY

1.15.1 GENERAL

Safety is the first priority to Advanced Aviation Training in all our activities. We are committed to developing and implementing strategies to ensure all of our aviation activities uphold the highest level of safety performance. We also strive to provide safe and secure work conditions and to foster positive safety attitudes.

The CEO and management are committed to developing a safety culture in all our activities resulting in an accident free workplace. Advanced Aviation Training want to develop a culture of open reporting of all safety hazards and support effective communication throughout the organisation.

To help Advanced Aviation Training continuously improve its safety performance all instructors and students are encouraged to report any new safety related events or issues directly to the CEO or HOO. The company will apply just culture principles to any report which identifies a newly identified safety issue accurately and in a timely manner.

1.15.2 SAFETY MANAGEMENT

Advanced Aviation Training commitment is to develop and embed a safety culture in all its activities, acknowledging that safety is paramount. This will be done through:

- student and instructor familiarisation training
- encouraging a healthy safety culture within the organisation
- fully supporting a non-punitive reporting culture
- promoting an environment of trust based on a clear understanding of acceptable and unacceptable behaviour

Acceptable behaviour; includes honest errors such as unintentional slips and lapses.

Unacceptable behaviour; includes negligent conduct, reckless conduct and intentional wilful unsafe acts and violations.

- actively encouraging the use of the various reporting tools
- encouraging direct feedback to the CEO or HOO
- clearly defining for all instructors and students their responsibility for achieving safety outcomes
- minimising the risks associated with the operation of aircraft to a point that is as low as reasonably practicable
- striving to continually improve safety performance
- conducting management reviews to ensure that relevant action for improvement is taken.

1.15.3 ACCIDENT AND INCIDENT REPORTING PROCEDURES

1.15.3.1 ACCIDENT AND SERIOUS INCIDENT REPORTING

All accidents and serious incidents must be reported to the CEO or HOO as soon as possible and to the ATSB by telephone toll-free call: 1800 011 034.

1.15.3.2 INCIDENT REPORTING

Routinely reportable matters must be reported within 72 hours via the ATSB Incident and Accident reporting website.

1.15.3.3 HAZARD REPORTING

Instructors and students must bring any matters that are considered to be a safety hazard to the attention of the CEO or HOO.

1.15.3.4 SAFETY INVESTIGATION

The CEO and HOO will carry out investigation of incidents, accidents and hazards if required, aiming to:

- improve the company's safety culture
- cultivate professionalism in aviation.

1.15.3.5 SUPPORTING LEGISLATION

Section 18 TSI Act 2003 and AIP ENR 1.14:

"Accidents and serious incidents (commonly called 'Immediately Reportable Matters'), which affect the safety of aircraft must, in the first instance, be notified to the ATSB by telephone toll-free call: 1800 011 034, and then followed by an online report within 72 hours via the ATSB Incident and Accident reporting website."

1.16 DANGEROUS GOODS

Dangerous goods are not to be carried on company operated aircraft. Certain items that might otherwise be considered dangerous are permitted IAW CASR 92.030. The PIC is to refer to this provision to determine if the article can be carried on any flight.

1.17 QUALITY SYSTEM

The use of Bob Tait's FSTD will be in accordance with the Management and Quality controls of the attached STROM (Synthetic Trainier Operations Manual).

Advanced Aviation Training

SIMULATOR-1

Synthetic Trainer Operations Manual (STOM)

Introduction

This document makes up the Synthetic Trainer Operations Manual (STOM) for the synthetic trainer SIMULATOR-1 installed and operated at:

Advanced Aviation Training,
Hangar N,
Redcliffe Airport,
Wirraway Drive,
Kippa Ring,
QLD 4021

The STOM outlines training requirements, operating procedures, briefings, and use of check lists as well as forms for recording amendments, calibration and unserviceabilities as well the syllabus of training for simulator instructors.

It is to be used operationally in association with the X-Plane Professional User Manual a printed copy of which is available at the instructor station in the Simulator Room. An abridged version of the X-Plane manual is included in Annex 1 to this document.

Advanced Aviation Training

SIMULATOR-1

Synthetic Trainer Operations Manual (STOM)

SIMULATOR-1 STOM - Table of Contents

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Synthetic Trainer Operations Manual (STOM)

Section 0: Table of Contents

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Synthetic Trainer Operations Manual (STOM)

SECTION 0: Distribution and Amendments

Distribution List

This manual is a controlled document and the issue of all copies is to be recorded in the following distribution list.

NAME	COPY	ISSUE DATE	SIGNATURE
Advanced Aviation Training (Master Library)	1		
CASA	2		
[HOO]	3		
Simulator	4		

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Synthetic Trainer Operations Manual (STOM)

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Amendment Record

Amendment Date	Issue Date	Date Amended	Name	Signature	Date of Certified Return

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Synthetic Trainer Operations Manual (STOM)

Section 1: Table of Contents

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SIMULATOR-1
Synthetic Trainer Operations Manual (STOM)

SECTION 1: Authorities and Requirements

Authorities

1. The installed simulator SIMULATOR-1 is a single and multi-engine Synthetic Trainer operated by Advanced Aviation Training Pty Ltd and it is to be operated in accordance with this manual and the relevant CAOs as an approved Category B synthetic trainer.
2. A copy of the CASA Synthetic Trainer Certificate (STC) is attached as Appendix A to this Section.

Test Officers

RESERVED

Instructor and Approved Persons

1. The instructor authorised to conduct training and supervision in the synthetic trainer and the person approved to operate the trainer are specified in Appendix B to this Section.
2. To gain approval as an authorised instructor, a person must undergo training in accordance with Section 4-1 of this manual and have logbook endorsed by the HOO or his authorised deputy to certify completion of this training.

Minimum Equipment List

1. The Minimum Equipment List applicable to this trainer is attached as Appendix C.

Maintenance Form and Certification of Continuing Standards

1. Any defect occurring during the operation of this trainer is to be recorded in the Maintenance Log located at the Instructor station. The Form of this document is attached as Appendix D.
2. A continuing fidelity check of frame rate and hardware serviceability is ensured by the computer software built-in-test completed on every program start and by record of any discrepancies and corresponding rectification in the Maintenance Log.
3. Compliance with the standard specified in the original Accreditation Test Guide attached as Appendix E of this section is to be conducted and certified annually by the HOO or his deputy. The record of this test shall be kept in the master manual of this STOM.
4. After each software upgrade is performed, a calibration check, in accordance with Appendix E shall be carried out and recorded in the master manual of the STOM. A record of this is to be forward within 28 days to CASA.

Advanced Aviation Training

SIMULATOR-1

Synthetic Trainer Operations Manual (STOM)

Appendix A: Certificate of Approval

RESERVED

Advanced Aviation Training

SIMULATOR-1

Synthetic Trainer Operations Manual (STOM)

Appendix B: Authorised Instructors and Operators

Name	Date Training Completed	Name of Training Instructor	Signature

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Appendix C: Minimum Equipment List

The minimum equipment required to operate this trainer in accordance with the Certificate attached as Appendix 1 is as follows:

Item	Number installed	Number Required for Certified Operations	Remarks or Exceptions
Cockpit Enclosure	1	1	
Cockpit Lights	1	0	Installed cockpit lighting is only required if certified operations can be conducted effectively without them.
C2 Flight Console	1	1	
Throttle Quadrant	1	1	Throttle quadrants are available for single (TPM) and multi engined (TTPPMM) aircraft. It is essential the appropriate quadrant is fitted for the aircraft model to be loaded into the trainer.
PFC Avionics Stack	1	1	
Rudder Pedals	1	1	
Computer	3	3	
USB X-Plane Professional Keys	3	3	One key must be installed to a USB slot in each computer in order for the simulator to be used for certified operations.
Pilot Display Monitor	2	2	
Pilot Keyboard and Mouse	1	0	Keyboard and mouse equipment is a convenience item for operations with only one operator.

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Item	Number installed	Number Required for Certified Operations	Remarks or Exceptions
			Keyboard and mouse are not required if instructor station keyboard and mouse are serviceable.
External Display Monitor	1	1	External LCD display is required for all certified operations.
Instructor Display Monitor	2	1	The instructor station monitor must be serviceable for certified operations except recency operations. The duplicated in-cockpit instructor station monitor must be turned off during all certified operations including recency operations.
Instructor Station (desk, chair, keyboard and mouse)	1	1	The simulator may be used for recency requirements with the instructor station inoperative.
Intercom	1	1	
Headsets	2	2	Headsets are required in order to monitor Morse code identifiers for navigation aids being used.
Printer	1	1	Printer is available via the internal network.
STOM (including X-Plane Pro Manual)	1	1	
Set of checklists for the simulator aircraft	1	1	

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Appendix D: Maintenance Log

Item No.	Date	Name	Discrepancy	Corrective Action

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Appendix E: Accreditation Test Guide

1. The accreditation test guide adheres to the Category B standards described in the Civil Aviation Safety Authority Form 248: Approved Synthetic Trainer Standards the content of which is reproduced below.

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CIVIL AVIATION SAFETY AUTHORITY AUSTRALIA

APPROVED SYNTHETIC TRAINER STANDARDS

Introduction

This form details the standards required for approved synthetic trainers.

These standards are set out as a checklist which can be used as the 'accreditation test guide'. The list is in two parts: *Part 1 - Physical Characteristics* and *Part 2 - Operating Characteristics*. Each part is further divided into sections under logical headings.

The form incorporates the requirements for all categories of synthetic trainer. The particular requirements for category B synthetic trainers are annotated with symbol (B). Category C synthetic trainers must meet all category B requirements, plus those annotated with the symbol (C).

Inspectors should be aware that the standards for switches and controls, other than flight controls, set out in Part 1 - Physical Characteristics is deliberately non-prescriptive. The word 'conventional', when applied to these items, should be taken in its broadest sense. The switches or avionics controls do not need to be 'realistic', they only need to be reasonably 'user friendly' and perform the functions required, thereby providing realistic cockpit management tasks.

> **Note:** A copy of this document, and those subsequently used in recurrent fidelity checks, must be retained permanently with the trainer.

Synthetic Trainer Details

Operator: Bob Tait's Aviation Theory School.Pty Ltd...

ARN: 562097..

Make: Precision Flight Controls ....

..........Model: PFC.Cat III.BATD... Serial Number: BTSIM-01...............

..........Software Name: X Plane ....Version Number: .9....................

Hardware Specification:
3xIBM pc's , Windows OS, 3xMonitors, 1xProjector Display, 1x PFC CirrusII Professional Console,1x PFC Avionics Console,1xPFC 430W unit,1x PFC Professional Rudders, Cockpit Enclosure

Synthetic Trainer Operations Manual

STOM satisfactory in all respects Yes ☒ No ☐

Inspector's Certification

This synthetic trainer *satisfies/~~does not satisfy~~ FSD 2 standards.
*(*delete as required)*

Inspector's Name: ....

Signature: ....

Date: ....

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PART 1 - PHYSICAL CHARACTERISTICS

1.1 General

Located in a dedicated area free from obtrusive light, noise or vibration	Yes ☒	No ☐
Size and shape of the enclosure compatible with the cockpit environment	Yes ☒	No ☐
Computer hardware capacity meets the minimum specification required to operate the software (where appropriate)	Yes ☒	No ☐
A pilot/s instructor intercom is provided	Yes ☒	No ☐

1.2 Pilot Station/s

Checklists are readily available for normal, simulated emergency and REAL emergency procedures	Yes ☒	No ☐
Size, general appearance and layout resemble a conventional single or multi-engine aircraft, as appropriate	Yes ☒	No ☐
Panel, instrumentation, switches, controls and their layout resemble that of a conventional aircraft	Yes ☒	No ☐
(C) Hardware and sound system standards applicable to flight simulators set out in subsections 11.1 and 11.4 of FSD 1	Yes ☒	No ☐
The representation and functioning of any electronic or cathode ray tube displays are realistic, stable, free from distortion or other distracting phenomena	Yes ☒	No ☐
All cockpit instruments, indicators, switches and controls can be viewed simultaneously	Yes ☒	No ☐
Instrument and cockpit lighting are adequate	Yes ☒	No ☐
Pilots' normal field of view excludes all but the cockpit environment and is free from distractions	Yes ☒	No ☐
(B) A conventional pilot/s radio transmit facility is available for simulated radio communication	Yes ☒	No ☐

Aeroplane synthetic trainer controls and their indicators include:

• Control column or control wheel	Yes ☒	No ☐
• Rudder pedals	Yes ☒	No ☐
• Wing flap selector and position indicator (where appropriate)	Yes ☒	No ☐
• Undercarriage selector and position indicating system (where appropriate)	Yes ☒	No ☐
• Throttle/power lever/s	Yes ☒	No ☐

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	• Propeller control/s (where appropriate)	Yes ☒	No ☐
	• Elevator trim and position indicator	Yes ☒	No ☐
	• Rudder trim and position indicator in multi-engine synthetic trainers	Yes ☐	No ☐
(B)	• A stall warning device	Yes ☒	No ☐
(B)	• Mixture control (where applicable)	Yes ☒	No ☐
(B)	• Carburettor heat control (where applicable)	Yes ☒	No ☐
	• Fuel tank selector (where applicable)	Yes ☒	No ☐
	• Fuel quantity indicator/s	Yes ☒	No ☐
	Helicopter synthetic trainer controls and their indicators include:	Yes ☐	No ☒
	• Cyclic pitch control stick	Yes ☐	No ☒
	• Collective pitch control lever	Yes ☐	No ☒
	• Tail rotor control pedals	Yes ☐	No ☒
	• Throttle (where applicable)	Yes ☐	No ☒
(B)	• Throttle/speed select lever/s (where applicable)	Yes ☐	No ☒
(B)	• Mixture control (where applicable)	Yes ☐	No ☒
	• Cyclic trim switch	Yes ☐	No ☒
	• Control friction	Yes ☐	No ☒
	• Fuel quantity indicator	Yes ☐	No ☒

1.3 Instructor Station

	Checklists are readily available for normal and REAL emergency procedures	Yes ☒	No ☐
	Instructor's console and controls are outside the pilots' field of view	Yes ☒	No
	The instructor's location is suitable to maintain surveillance of the pilot, the trainer's instruments and switches and the flight path display	Yes ☒	No ☐
	The instructor can impose the effect of omni-directional wind on the trainer's flight path, with selectable increments of at least 30° in direction and 5 knots in speed up to at least 30 knots	Yes ☒	No ☐
	A method of creating at least three levels of in-flight turbulence is provided	Yes ☒	No ☐
	A flight path display is provided, in azimuth and elevation, relative to the navigation aid/s	Yes ☒	No ☐
	The flight path display provides a record of the simulated flight path for student debrief	Yes ☒	No ☐
(B)	The flight path display plots in relation to a representative current Australian radio navigation chart	Yes ☒	No ☐
(B)	A system is provided for the instructor to distinguish between pilot/s intercom communication and simulated radio transmissions	Yes ☒	No ☐

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1.4 Instrument Systems

Instrument presentation, markings and layout are 'conventional'... Yes ☒ No ❑

Basic operational instruments available include:

	Instrument	Minimum Range	
	• ASI	Appropriate, marked in knots	Yes ☒ No ❑
	• Altimeter	0 - 9 999 feet adjustable sub-scale in HPA	Yes ☒ No ❑
	• Compass	360°	Yes ☒ No ❑
	• Clock	Hours, minutes and seconds.....................	Yes ☒ No ❑
	• VSI, for helicopters, IVSI	±1200 fpm...	Yes ☒ No ❑
	• AI	Pitch +20,° -10° Roll ±60° for helicopters, a 5-inch display................	Yes ☒ No ❑
(B)	• DG	360° adjustable heading bug.....................	Yes ☒ No ❑
	• T & S/Turn Coordinator Slip only where extra AI is fitted. Slip only for helicopters	±Rate one	Yes ☒ No ❑
	• VSI	±2000 fpm...	Yes ☒ No ❑

The following engine instruments with representative markings, including limitations, are fitted:

- Tachometer/propeller/rotor speed .... Yes ☒ No ❑
- Manifold pressure/torque(where applicable).. Yes ☒ No ❑
- Oil pressure.. Yes ☒ No ❑

1.5 Radio Navigation Systems

Instrument presentation, markings, layout, controls and frequency selection are 'conventional' .... Yes ☒ No ❑

ADF or VOR is available for pilot navigation. .... Yes ☒ No ❑

(B) Navigation aid frequency bands are conventional and tunable by the pilot/s .... Yes ☒ No ❑

(B) Station identification morse code audio is pilot selectable for each aid and simultaneously available to the pilot/s and instructor .... Yes ☒ No ❑

(B) Radio navigation stations available are representative of a current Australian radio navigation chart providing realistic instrument navigation exercises .... Yes ☒ No ❑

(B) Each aid can be 'failed' from the instructor station .... Yes ☒ No ❑

(B) Radio navigation aid capability to the following specifications is available: .... Yes ☒ No ❑

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Navigation Aid	Ground Stations (minimum)	Accuracy	
ADF	Three	Track ± 8° Origin ± 2nm	Yes ☒ No ☐
VOR	Three	Track ± 6° Origin ± 2nm	Yes ☒ No ☐
DME or GPS, indicator/s must provide both distance and rate of change of distance	DME - Three	Distance & Speed ± 10% Origin ± 2nm	Yes ☒ No ☐
LLZ	One, plus an omni directional aid for orientation and to intercept final	Track ± 0.5° Origin ± 1nm	Yes ☒ No ☐
Glideslope	One, associated with LLZ	Slope ± 0.5% Origin ± 1nm	Yes ☒ No ☐
Marker Beacon	Outer and middle, associated with LLZ	Satisfactory.......................	Yes ☒ No ☐

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PART 2 - OPERATING CHARACTERISTICS

2.1 Effects of Controls - Aeroplanes

Flight Controls

- **Elevator:**
  - Operation and effect are conventional .... Yes ☒ No ☐
  - Control forces acceptable .... Yes ☒ No ☐
- **Ailerons:**
  - Operation and primary effect are conventional .... Yes ☒ No ☐
  - Secondary effect is conventional .... Yes ☒ No ☐
  - Control forces acceptable .... Yes ☒ No ☐
- **Rudder:**
  - Operation and primary effect are conventional .... Yes ☒ No ☐
  - Secondary effect is conventional .... Yes ☒ No ☐
  - Control forces acceptable .... Yes ☒ No ☐
- **Wing Flap (where appropriate):**
  - Operation and indication are conventional .... Yes ☒ No ☐
  - Effect on performance is conventional .... Yes ☒ No ☐
- **Undercarriage (where appropriate)**:
  - Operation and indication are conventional .... Yes ☒ No ☐
  - Effect on performance is conventional .... Yes ☒ No ☐
- Throttle/Power lever/s operation, indication and effects are conventional .... Yes ☒ No ☐
- Propeller control/s operation, indication and effects are conventional .... Yes ☒ No ☐
- Mixture control/s operation, indication and effects are conventional .... Yes ☒ No ☐
- Carburettor heat control/s operation, indication and effects are conventional .... Yes ☒ No ☐
- **Trim/s:**
  - Operation and indication are conventional .... Yes ☒ No ☐
  - Effective in all configurations, speeds and power settings .... Yes ☒ No ☐
  - Any other controls operation, indication and effects are conventional .... Yes ☒ No ☐

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2.2 Effects of Controls - Helicopters

Flight controls

- **Cyclic:** ◦ Operation and effect are conventional .... Yes ☐ No ☒
  - Control forces minimal.................... Yes ☐ No ☒
- **Collective/(throttle where appropriate):**
  - Operation and primary effect are conventional.................... Yes ☐ No ☒
  - Secondary effect (yaw) is conventional .... Yes ☐ No ☒
  - Control forces acceptable .... Yes ☐ No ☒
- **Tail rotor pedals:**
  - Operation and primary effect are conventional.................... Yes ☐ No ☒
  - Secondary effect (roll) is conventional .... Yes ☐ No ☒
  - Control forces minimal.................... Yes ☐ No ☒
- **Undercarriage (where appropriate):**
  - Operation and indication are conventional .... Yes ☐ No ☒
  - Effect on performance is conventional .... Yes ☐ No ☒
- **Mixture control/speed select lever/s (as appropriate):**
  - Operation, indication and effects are conventional.................... Yes ☐ No ☒
- Cyclic trim operation and effect are conventional.................... Yes ☐ No ☒
- Any other controls operation, indication and effects are conventional.................... Yes ☐ No ☒

2.3 Instrument Systems

The accuracy of the following instruments is adequate, they respond realistically to control inputs and, where appropriate, all changes in configuration, speed and power within the attitude limits of the trainer.

- ASI.................... Yes ☒ No ☐
- Altimeter .... Yes ☒ No ☐
- Compass.................... Yes ☒ No ☐
- Clock.................... Yes ☒ No ☐
- VSI.................... Yes ☒ No ☐
- AI .... Yes ☒ No ☐
- DG.................... Yes ☒ No ☐
- T & S or Turn Coordinator .... Yes ☒ No ☐

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2.4 Handling - Aeroplanes

		Yes	No
	Performance in climb, cruise and descent is conventionally related to power and attitude	☒	☐
	Total drag is accurately represented with a realistic minimum drag speed (it may be necessary to plot speed/power relationship in level flight)	☒	☐
	Longitudinal, directional, lateral and dutch roll stability is adequate	☒	☐
	Representative increase in elevator back pressure and corresponding decrease in speed during level turns	☒	☐
	Slip/skid and effect of rudder while turning is conventional	☒	☐
	Turns at high speed, including spiral dive effects are conventional	☒	☐
	Stalling, with or without power, and stall in a turn is conventional	☒	☐
	Unusual attitude recovery realistic (within the attitude limits of the trainer)	☒	☐

> **Note:** If software limitations limit normal indication of any flight instrument to a limited range of pitch and/or bank, those limits become the limits of the trainer unless the trainer limits are less. A normal indication is one which an observer would expect to see in an aircraft conducting the same manoeuvre.

		Yes	No
	Indications, effects and procedures for simulated systems failures are conventional	☒	☐
(B)	Effectiveness of flight controls varies with IAS	☒	☐
(B)	Stalling is aerodynamically simulated and dependent on angle of attack, flap setting or configuration; stall warning is operative	☒	☐
(B)	Power available decreases conventionally (where appropriate) with increasing altitude	☒	☐
(B)	Cruise IAS decreases conventionally (where appropriate) with increasing altitude	☒	☐
(C)	Performance and flight characteristics which essentially simulate that of the specific aeroplane	☒	☐

2.5 Handling - Helicopters

		Yes	No
	Performance in climb, cruise and descent is conventionally related to collective pitch, power and attitude	☐	☒
	Total power requirement is accurately represented with a realistic minimum power speed	☐	☒
	Helicopter stability characteristics are adequately represented	☐	☒
	Representative back stick and corresponding speed reduction in level turns	☐	☒
	Slip/skid and effect of yaw control while turning is conventional	☐	☒
	Unusual attitude recovery realistic	☐	☒
	Indications, effects and procedures for simulated systems failures are conventional	☐	☒
(B)	Flare effect on rotor RPM during descent is adequately represented	☐	☒
(B)	Power available decreases conventionally with increasing altitude	☐	☒
(B)	Cruise IAS decreases conventionally with increasing altitude	☐	☒
(C)	Performance and flight characteristics essentially represent those of the specific helicopter	☐	☒

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2.6 Radio Navigation systems

	Inter-relationship between indicated air speed, heading, ground speed and track made good is accurate	Yes ☒	No ☐
	Effect of selected wind velocities is accurate	Yes ☒	No ☐
	All aids meet accuracy requirements, *see Part 1*	Yes ☒	No ☐
	ADF needle sensitivity, overhead, tracking and fail indication are conventional	Yes ☒	No ☐
	VOR needle sensitivity, overhead, TO/FR, tracking and fail indication are conventional	Yes ☒	No ☐
	Flight path recorder accurately reflects ground speed and track made good from aid/s	Yes ☒	No ☐
(B)	Indicated tracks and distances between ground stations corresponds to same route on radio navigation chart	Yes ☒	No ☐
(B)	DME or GPS sensitivity, time/distance equation, overhead and fail indication are conventional	Yes ☒	No ☐
(B)	LLZ needle sensitivity, tracking and fail indication are conventional	Yes ☒	No ☐
(B)	Glideslope needle sensitivity, tracking and fail indication are conventional	Yes ☒	No ☐
(B)	Glideslope relationship to altitude, DME or GPS and marker beacon/s are accurate	Yes ☒	No ☐
(B)	The flight path display is accurate to ±5 degrees for tracking and ± 10% in distance flown.	Yes ☒	No ☐

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SECTION 2: Operating Procedures

General Description

1 The synthetic trainer herein referred to as SIMULATOR-1 operated at Advanced Aviation Training is a fixed-base training device incorporating hardware manufactured by Precision Flight Controls Inc. (11340 White Rock Road, Suite 100, Rancho Cordova, CA 95742 USA) and X-Plane Professional Software developed by Laminar Research (1005 Brentwood Court Columbia, SC, 29206 USA).

2 The trainer is controlled by 3 PCs running Windows 7 operating systems and X-Plane Professional software. The role of each PC is broken down as follows:

2.1 The Controller PC is the main machine handling connections to the flight control hardware and providing full screen panel visuals spread over two monitors.

2.2 The Instructor Station PC handles the instructor station interface and drives two duplicated monitors. One monitor is mounted inside the cockpit while the other is situated on the instructor station desk.

2.3 The External Visuals PC is responsible for presenting the external visuals on the LCD screen mounted on the wall outside of the cockpit enclosure.

3 A PFC C2 Professional Flight Console is connected via a serial port to the Controller PC and the C2 console in turn provides connections for the PFC Avionics stack and PFC Professional rudder pedals.

4 The C2 allows for interchangeable throttle quadrants to be fitted depending on the aircraft to be simulated. Simulation models exist for a generic twin and a generic low wing single engined aircraft.

5 The flight controls and 2-place seating arrangement are mounted inside a simulated cockpit enclosure which is representative of both single and multi-engined aircraft.

6 An instructor station is located to the left hand side of the cockpit enclosure. The station includes a monitor, keyboard and mouse which allows the instructor/operator to set simulation parameters, perform maintenance procedures, initiate malfunctions and monitor/record simulated flights. The instructor is able to communicate with the pilot inside the enclosure via a headset which is connected to the simulate intercom.

7 The X-Plane professional software is used in all of Precision Flight Controls FAA-approved CAT I-III BATD, AATD and MFD systems and the software fulfils the requirements of CASA FSD-2 requirements for a Cat B trainer. The software includes an Australia-wide navigation and scenery database.

7.1 The navigation database will be amended on the basis of software updates provided by the manufacturer. Installation of any updates will be recorded in the maintenance log (see Section 1 – Appendix D).

7.2 Should modifications to the navigation data be required between software updates in order to maintain accuracy with current IFR charts, these changes will be made by an instructor authorised to operate the SIMULATOR-1 equipment.

General Operating Procedures

1. The trainer is to be "powered-up", pre-flight checked and shut down only by a person nominated in Section 1 – Appendix B.
2. The trainer is to be operated at all times as though it was a real aircraft. The Normal and Emergency procedures to be used are those contained in the POH (Pilot Operating Handbook) for the aircraft being simulated. The POH is to be kept in the Simulator Room at all times and be readily available as required.
3. Except as specified otherwise in this document, the trainer is to be operated and maintained in accordance with this manual and the PFC hardware operating notes.
4. Checklists applicable to all trainer exercises are specified in Appendix B.
5. Student/Instructors are to use current Air Services Australia en-route, area and DAP charts or Jeppesen equivalents.

Pre- and Post-Flight Briefings

1. All training sessions are to be the subject of normal, pre- and post-flight briefings.
2. The pre-flight briefing is to include a description of the exercise objectives and overview of the exercise.
3. Where a simulated navigation exercise is to be flown, a standard IFR flight plan is to be completed before the exercise begins. The planning data specified in the checklist attached as Appendix B are to used.
4. Where a student or is unfamiliar with the trainer operating characteristics, the pre-flight briefing is to include relevant systems description and specification of applicable operating data.
5. Instrument Rating Test candidates are to be endorsed before a rating renewal is conducted.

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Use of Checklists

1. The checklist attached at Appendix B are to be used for all simulated operations.

Unserviceability Records

1. Any noted unserviceability is to be logged in the Maintenance Form (Section 2 Appendix C). This form is to be kept in the folder at the instructors' station. The trainer is not to be used until the unserviceability has been certified as having been cleared.

Recording of Flight Time

1. Each flight is to be recorded in the Aero-Guidance Mark 6 Flight Record Form (Section 2 - Appendix A).

Action in the Event of a Real Emergency

1. In the event of a fire in the trainer environment, trainer power is to be switched off at the main wall outlet and extinguishers used as appropriate. If the situation cannot be resolved, the trainer room is to be evacuated and emergency services notified.

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Appendix A: Flight Record Form

SIMULATOR FLIGHT RECORD

SIMULATOR-1 START DATE: ____________________

1. All training flight times and charges are calculated by V.D.O. clock from Master switch ON to master switch OFF. If the V.D.O. clock is not available actual times are required.

2. All private hire is calculated by use of V.D.O.

3. Please complete all columns in block letters on completion of each flight.

4. Should any discrepancy exist in the V.D.O. reading between the last time "in" entered and the reading prior to engine start, the error should be reported to the operations section immediately. Failure to do so may result in excessive time being charged to the hirer.

Day of Month	PIC and Student	VDO Clock Time		Flight Time	Exercise		
		Out	In		Ex. No	Instructor	Invoice

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Appendix B: Trainer Checklists

1. STARTING THE TRAINER

1.1. Ensure that all plugs and cables are correctly and fully inserted in their respective sockets.

1.2. Power on all three PC's via the power button behind the front access panel of each computer. The order of powering on is not important.

1.3. Start X-Plane Professional on each of the three PC's using the icon on the Computer Desktop screen.

1.4. During the X-Plane start-up procedure, fidelity and frame rate checks will be made by the system.

1.5. Should an error occur, contact an authorised instructor or the office manager.

1.6. Using the remote control power on the external visual monitor.

1.7. Using the remote control turn on the internal cockpit lighting as required. Buttons on the remote are available for various in-cockpit colour settings.

1.8. Inside the cockpit, turn on the intercom located on the LHS of the C2 flight console. Ensure all cables are connected.

1.9. To ensure calibration of the equipment it is necessary to check the “Joystick and Equipment” page of X-Plane's “Settings” menu.

1.9.1. Using the mouse available inside the cockpit enclosure, activate the menu bar by moving the cursor to the top of the cockpit instruments display.

1.9.2. Click on the “Settings” menu and select the “Joysticks and Equipment” menu item.

1.9.3. On the “Equipment” tab, ensure the correct throttle quadrant configuration is selected in the PFC equipment section on the RHS.

1.9.3.1 For simulating twins, ensure the “2 throttle prop mixture” option is selected.

1.9.3.2 For simulating singles, ensure either the “1 heat throttle mixture” option or “1 throttle prop mixture” option is selected depending on aircraft model being simulated.

1.9.4. Select the “Null Zone” tab and ensure all equipment is calibrated and centred correctly.

1.9.5. Exit the menu via the small “X” icon in the top left or right corner.

1.9.5.1 See section 4.6 of the X-Plane Manual in Annex 1 of this document for more information.

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1.10. PRE-START CHECKLIST

(* indicates items which will vary with the installed throttle quadrant.)

```
GEAR. .....................DOWN
CARB HEAT................. CLOSED *
THROTTLE(s)............... CLOSED *
PROPELLOR(s).............. FULL FINE *
MIXTURE(s)................ FULL RICH *
FUEL. .....................BOTH
RUDDER TRIM. ..............CENTERED
AILERON TRIM. .............CENTERED
PARKBRAKE................. PULLED ON
MASTER SWITCH. ............OFF
AVIONICS MASTER. ..........OFF
ALT SWITCH(s). ............OFF
LIGHT SWITCHES. ...........OFF
PROP SYNC. ................OFF
ICING. ....................OFF
INTERCOM. .................ON
```

1.11. Using the X-Plane "LOCAL MAP" interface on the instructor station monitor, configure required flight parameters as described in Chapter 5, Sections 5.1-5.4 of the X-Plane 10 Professional Manual (see Annex 1).

1.11.1. A printed copy of the X-Plane Professional Manual is also available at the instructor's station.

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1.12. START-UP CHECKLIST

```
THROTTLE(s). ..............SET
PROPELLOR(s). .............FINE
MIXTURE(s). ...............RICH
MASTER SWITCH. ............ON

For the engine to be started:
IGNITION KEY.............. START THEN BOTH
ALT SWITCH. ...............ON

After all engines started:
AVIONICS MASTER. ..........ON
```

1.13. Proceed with the planned exercise or load one of the saved flight situations.

1.13.1. Situations can be loaded in accordance with the instructions in the X-Plane Professional Manual (see Annex 1)

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2. SHUTTING DOWN THE TRAINER

2.1. SHUTDOWN CHECKLIST

```
GEAR. .................... DOWN
CARB HEAT................. CLOSED *
THROTTLE(s)............... CLOSED *
PROPELLOR(s).............. FULL FINE *
MIXTURE(s)................ FULL RICH *
FUEL. .................... BOTH
RUDDER TRIM. ..............CENTERED
AILERON TRIM. ............ CENTERED
PARKBRAKE................. PULLED ON
MASTER SWITCH. ........... OFF
AVIONICS MASTER. ......... OFF
ALT SWITCH(s). ........... OFF
LIGHT SWITCHES. .......... OFF
PROP SYNC. ............... OFF
ICING. ................... OFF
INTERCOM. ................ ON
VDO READING. ............. RECORDED
COCKPIT LIGHTING. ........ OFF
```

2.2. Items marked (*) will vary depending on the throttle quadrant installed for the planned flight operation.

2.3. Ensure the VDO reading is recorded on the Flight Record Sheet (Appendix A).

2.4. From the instructor's station, select “Shut Down All” on the Local Map screen. This will send a shut-down signal to all computers and power off the simulator system.

2.4.1. Should this command fail, each computer must be powered off manually. This can be done by quitting out of X-Plane using the X-Plane File Menu and then using the usual Windows 7 interface to power-off the PC.

2.5. To protect the simulator against electrical surges, power plugs must be removed from the power board on the instructor's desk before leaving the simulator room after the last flight of the day.

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Appendix C: Maintenance Form

This form is used to endorse any unserviceabilities noted with the simulator equipment or software. Usage of the synthetic trainer for certified operations is not permitted if endorsements on the maintenance form have not been cleared with a signature of an authorised instructor. Certified operations may still be undertaken if the endorsed defect is covered by an entry in the MEL of Section 1 Appendix – C and any appropriate operational restrictions noted in the MEL are observed.

Advanced Aviation Training		**Year**	
MAINTENANCE REQUIREMENTS – Endorsements must be cleared by an authorised operator/instructor before the this Synthetic Trainer may be used for Certified Operations (including recency requirements) unless the endoresement relates to items covered by the MEL for this equipment and operation restrictions noted in the MEL are observed.			
Item No.	**Maintenance Required**	**Due at Date or Total Time**	**Certified complied with**

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SECTION 3: Instructor Training Procedures and Requirements

Instructor Training and Endorsement

1. Instructor training is to be conducted by an appointed delegate as nominated in Section 1 Appendix B
2. Instructor training is detailed in the syllabus attached as Appendix Ato this section.
3. Certification of completion of training and authorisation to operate the trainer shall be entered in this manual (Section 1-Appendix B) and also entered into the body of the instructor's logbook.

Instructor Operating Procedures

1. Power-up, pre-flight and post-flight procedures are detailed in the instructor's checklist located in the instructor's station (Section 1 – Appendix B).

Simulation of Operating Environment

1. Unless the simulator is being used only to teach basic instrument flying techniques or used as a radio navigation aid part-task trainer, the instructor/test officer is to simulate a normal airspace operating environment appropriate to the trainer’s simulated position in space.

2. The instructor/ test officer is to simulate all relevant radio calls from ground-based agencies and/ or from other simulated aircraft. The student/candidate will be required to initiate, or respond to, all radio calls appropriate to the phase of flight and simulated airspace by depressing the simulator press-to-talk switch.

3. The cloud, wind velocity and turbulence simulation controls at the instructor station should be used realistically as appropriate to the nature and objectives of each exercise.

Post Flight use of Map Display

1. The instructor station chart display (and associated flight recorder) is to be used as appropriate to debrief a flight.

2. Flight records are saved as Replay files in the Output directory of the simulator and the plan view of the flight track may be viewed at the instructor station or the entire flight replay can be loaded for playback and review.

3. Flights paths can be printed from the instructor station computer.

4. For all instruments rating training sessions, the flight recorder record is to be identified by

student name, date, exercise. The session should be printed or saved to the host computer flight record directory.

Record of Student Training

1. The results of all synthetic trainer sessions conducted as part of an instrument rating training course or to accrue flight time credits are to be recorded in student training records of the school conducting the training.

Instrument and Approach Recency Requirements

1. The trainer may be used for the accrual of instrument time and instrument approach recency requirements as specified in CAO 40.2.1.

2. Data on the use of the trainer to meet the CAO 40.2.1 instrument time and approach recency requirement are to be recorded in the Flight Record Form (Section 2-Appendix A).

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Appendix A: Instructor Training Syllabus

TRAINER OVERVIEW

1. Identify trainer components
2. Recall basic method of operation
3. Recall menu pages available and methods of selection
4. Recall method of position changing
5. Recall map display characteristics

BASIC INSTRUCTOR OPERATIONS

1. Switch on synthetic trainer master switch and monitors boot procedure.
2. Load navigation database
3. Perform calibration procedure as necessary
4. Set environmental conditions
5. Change Locations as necessary and position aircraft for start
6. Monitor start sequence
7. Provide ground manoeuvring instruments as required
8. Operate altitude, heading and freeze controls after take-off as required
9. Direct flight path to final approach using map screen
10. Monitor flight deck shut down after landing
11. Shut-down trainer and power off

FLIGHT EXPERIENCE

1. Perform pre-start, start and pre-take-off procedures using the trainer checklist
2. Perform visual take-off and handling familiarisation using visual and instrument altitude cues
3. Perform basic manoeuvres in simulated IMC to determine Power/Attitude/configuration parameters
4. Execute NDB, VOR and ILS approaches to missed approaches.
5. Execute a directed approach to a visual landing.

ENDORSEMENTS

1. Perform all instructor station power-up and pre-flight checks
2. Direct and monitor check instructor through a nominated IFR flight
3. Provide typical and correct ATC instructions through all phases of flight
4. Simulate designated system failures and direct corrective action
5. Identify and correct (in-flight and in debrief) student IFR operational and technique errors.

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Appendix B: Instructor Station Checklists

POWER UP AND PRE-FLIGHT

1. Plug all power plugs into power board.
2. Power up the instructor station PC using the computer power button.
3. Switch on monitor.
4. Set weather environment as described in the X-Plane Professional Manual, Section 5.4 (see Annex 1).
5. Set malfunction environment (if applicable) as described in the X-Plane Professional Manual, Section 6.8 (see Annex 1).
6. If necessary change fuel and payload as described in the X-Plane Professional Manual, Section 6.7 (see Annex 1)
7. If necessary change Time of Day as described in the X-Plane Professional Manual, Section 5.4 (see Annex 1).
8. Monitor pilot pre-flight checks

POST- FLIGHT CHECKS

1. De-brief using the map screen
2. If applicable save the flight recording
3. Record flight time and other relevant data.
4. Quit program
5. Shut down the host computer using Windows 7 interface
6. Turn off monitors
7. Unplug all cables from power board
8. Turn off air-conditioner and lights
9. Lock rooms.

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SECTION 4: Training Syllabus

Synthetic Trainer Conversion Syllabus

1. Pilot's undergoing training or testing must first be endorsed on the trainer and their endorsement certified in the Record of endorsements form (Appendix A).
2. The following syllabus details the endorsement training for pilots:

SECTION	OBJECTIVES	PLANNED TIME
1	Trainer overview Briefing: 1. Identify trainer components 2. Recall method of operation 3. Recall control technique 4. Recall basic Power/Attitude/Configuration data	0.5
2	1. Perform pre-start, start, after-start and pre-take-off checks using a checklist 2. Correctly utilise all avionic and instrument control 3. Perform a visual take-off 4. Execute directed manoeuvres using visual/instrument and instrument only cues 5. Identify simulated abnormal operating conditions and take corrective action. 6. Perform a direct approach to a visual landing 7. Perform after landing and shut down checks using the trainer checklist	1.0
3	1. Operate the Radio Navigation equipment (En-route and approach)	0.5

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Use of the Synthetic Trainer to gain Credits

1. The trainer may be used to gain credits as specified in the Trainer STC (Section 1 - Appendix A) provided the organisation using the trainer has a CASA accepted syllabus specifying the details of each sequence to be flown in the trainer.

Syllabus of Training – PPL, CPL

1. The synthetic trainer sequences to be flown for the Recreational, Private and Commercial Pilot License will be as specified in the relevant syllabus of training in the Operations Manual considering the following relevant credits.

COURSE	SYLLABUS REFERENCE	SYLLABUS HOURS REQUIREMENT	SYNTHETIC TRAINER HOURS CREDIT
RPL	26_RPL (A)	1.0	1.0
PPL	PPL (A) 2,3,5,6	2.0	2.0
CPL	CPL (A) 6,10	10	5
NVFR	NVFR(A)1,2	2.5	1.2

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Appendix A: Pilot Endorsement Record

STUDENT LOGBOOK ENDORSEMENT

Advanced Aviation Training
SIMULATOR-1 – Pilot Endorsement

This certifies that on the 6th January, 2014, Jane Amanda Smith, ARN 123456, had completed a course of training in accordance with Bob Tait's Aviation Theory School Pty Ltd STOM and found competent in the use of the Simulator-1 synthetic trainer.

SIGNATURE:...
DATE:..

John Pilot, Simulator Instructor ARN 123457
Advanced Aviation Training

INSTRUCTOR'S LOGBOOK ENDORSEMENT

Advanced Aviation Training
SIMULATOR-1 – Instructor Endorsement

This certifies that on the 6th January, 2014, Jane Amanda Smith, ARN 123456, had completed a course of training in accordance with Bob Tait's Aviation Theory School Pty Ltd STOM and found competent to instruct in the use of the Simulator-1 synthetic trainer.

SIGNATURE:...
DATE:..

John Pilot, Simulator Instructor ARN 123457
Advanced Aviation Training

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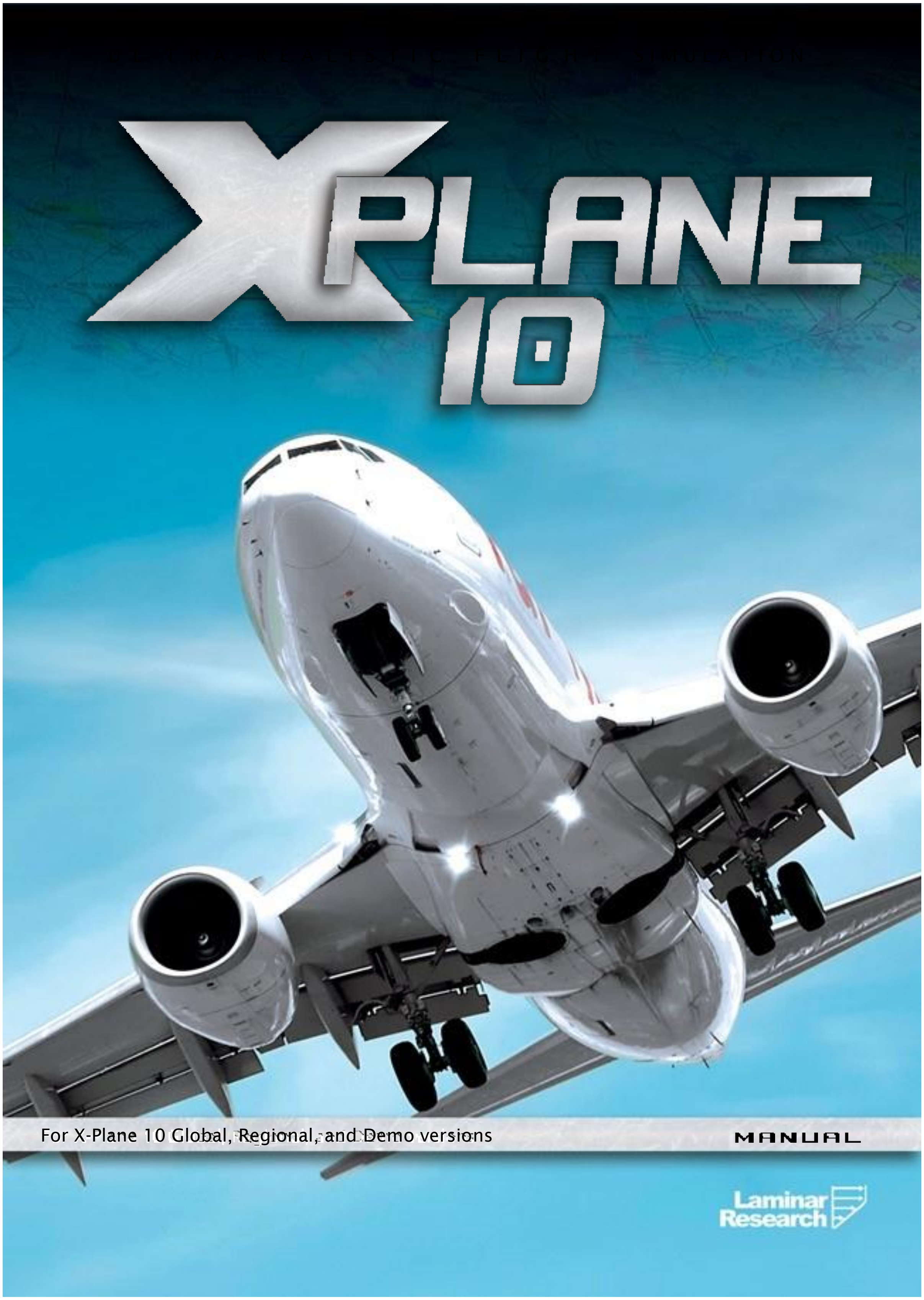
ANNEX 1: X-Plane Professional User and Operator Manual

1. The following pages contains an abridged version of the user and operator manual for X-Plane Professional software. Non-relevant sections of the manual have been excluded from this Annex.

2. Where appropriate procedures and actions described in this STOM should be performed with reference to the manual in this Annex.


X-PLANE 10
For X-Plane 10 Global, Regional, and Demo versions
MANUAL
Laminar Research

About This Manual

This is version 10.203 of the manual to the home and professional versions of X-Plane (X-Plane 10 Global and X-Plane 10 for Professional Use, respectively), last updated February 26, 2013. The latest version of the manual will always be available for download from the X-Plane.com web site.

Throughout the text, there will be cross-references to other parts of the manual, as well as hyperlinks to web pages. These will be formatted as gray text. For instance, clicking the following reference to this section will bring you to the top of the current page:

About This Manual

The Table of Contents is also cross-referenced; click on the section you' re looking for to travel there instantly. Alternatively, the PDF' s bookmarks can be used to navigate quickly through the manual. If you are using the Adobe Acrobat or Apple Preview PDF viewers, you can display these bookmarks by clicking the buttons shown in Figure 1, respectively.

Figure 1: Buttons to show bookmarks in Acrobat (left) and Preview (right) PDF viewers [Full size →]

If you would like to receive a free guide to many of the most important features of X-Plane, you can sign up for our free email course. By signing up, you' ll be able to learn all the most important features of X-Plane at your own pace, without having to search through the manual for the feature you' re interested in. This course will show you how to:

- add new aircraft to X-Plane for free,
- simulate out-of-this world situations (literally!), like flying the Space Shuttles re-entry into the atmosphere,
- dogfight against your friends or X-Planes artificial intelligence,
- shoot approaches to your favorite runways, and more!

Sign up for the free course to get the most out of X-Plane.

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Chapter 1

About X-Plane

1.1 Overview

X-Plane is the world's most comprehensive and powerful flight simulator for personal computers, and it offers the most realistic flight model available.

X-Plane is not a game, but an engineering tool that can be used to predict the flying qualities of fixed- and rotary-wing aircraft with incredible accuracy.

Because X-Plane predicts the performance and handling of almost any aircraft, it is a great tool for pilots to keep up their currency in a simulator that flies like the real plane, for engineers to predict how a new airplane will fly, and for aviation enthusiasts to explore the world of aircraft flight dynamics.

Welcome to the world of props, jets, single- and multi-engine airplanes, as well as gliders, helicopters and VTOLs. X-Plane contains subsonic and supersonic flight dynamics, allowing users to predict the flight characteristics of the slowest aircraft or the fastest. X-Plane also includes more than 30 aircraft in the default installation, spanning the aviation industry and its history. Aircraft included range from the Bell 206 JetRanger and Cessna 172 to the Space Shuttle and the B-2 Bomber. Additionally, some 2,000 additional aircraft models can be downloaded from the Internet (X-Plane.org, the X-Plane.com Links page, and Google are good places to start looking), many of which are completely free. If those aren't enough, users can design their own airplanes and test-fly them!

The full X-Plane scenery package covers the Earth in stunning resolution from 74° north to 60° south latitude. Users can land at any of over 33,000 airports or test their mettle on aircraft carriers, oil rigs, frigates (which pitch and roll with the waves), or helipads atop buildings. They can also realistically model the flight of remote-controlled model aircraft, perform an air-launch in an X-15 or Space Ship One from the mother ship, fly re-entries into Earth's atmosphere in the Space Shuttle, fly with friends over the Internet or a LAN, drop water on forest fires, or shoot approaches to aircraft carriers at night in stormy weather and rough water conditions in a damaged F-4. The situations that can be simulated are unbelievably diverse!

Weather in X-Plane is variable from clear skies and high visibility to thunderstorms with controllable wind, wind shear, turbulence, and micro bursts. Rain, snow, and clouds are available for an instrument flying challenge, and thermals are available for the gliders. Actual weather conditions can be downloaded from the Internet, allowing users to fly in the weather that really exists at their current location!

X-Plane has detailed failure modeling, with multitudes of systems that can either be failed manually at an instructor's command, or randomly when users least expect it! Users can fail instruments, engines, flight controls, control cables, antennae, landing gear, or any of dozens of other systems at any moment. They can also have a friend or flight instructor (locally or via the Internet, working from an Instructor's Operating Station) fail components on the aircraft without the pilot's knowledge. The instructor can alter the time of day, weather conditions, and failure status of hundreds of aircraft systems and components. Additionally, the instructor can relocate the aircraft to a location of his or her choice at any time.

Aircraft models are also extremely flexible, allowing users to easily create paint jobs, sounds, and instrument panels to modify any airplane you choose. Custom airplane or helicopter designs can even be created and flown using X-Plane and the included Plane Maker software.

X-Plane is used by world-leading defense contractors, air forces, aircraft manufacturers, and even space agencies for applications ranging from flight training to concept design and flight testing.

For example, X-Plane has been used in crash investigations to depict the view pilots experienced moments before a mid-air collision, or to graphically present to juries and judges the forces that impact an aircraft in flight. Scaled Composites used X-Plane to visualize Space Ship One's flights to the edge of the atmosphere in their pilot training simulator. Kalitta has used X-Plane to train their pilots to fly freight 747s in the middle of the night. Northwest and Japan Airlines use X-Plane for flight review and training. Cessna uses X-Plane to train new customers in the intricacies of the Garmin G1000. Dave Rose has used X-Plane to optimize airplanes for his many wins at Reno. NASA has used X-Plane to test the re-entry of gliders into the Martian atmosphere, and the list goes on. These customers serve as perhaps the most significant endorsement of the incredible capabilities of this simulator.

Furthermore, X-Plane has received certification from the FAA for use in logging hours towards flight experience and ratings. This experience can provide credit towards a private pilot's license, re-currence training, hours towards instrument training, and even hours towards an Airline Transport Certificate—it's that good.

1.2 What X-Plane Includes

Windows, Mac, and Linux installers are included with X-Plane 10 Global (the version of X-Plane available from X-Plane.com). It includes over 70 GB-worth of scenery (covering essentially the entire world) and over thirty aircraft, with thousands of planes available on the web. The DVDs contain everything needed to run X-Plane—there is nothing more that you need to buy. You'll receive free updates to X-Plane 10 until Version 11 is released, as well some of the best customer service and tech support available.

While on its own X-Plane represents the world's most comprehensive flight simulator, the in- stallation DVD also comes with Plane Maker, allowing users to create custom aircraft or modify existing designs, and Airfoil Maker, allowing users to create airfoil performance profiles.

The stock installation includes the following aircraft:

Cirrus Vision SF50
Beechcraft Baron 58
Cessna 172SP
Piaggo P.180 Avanti
Stinson L-5 Sentinel
ASK-21 glider
Beechcraft King Air C90B
F-22 Raptor
Lockheed SR-71 Blackbird
Boeing AV-8B Harrier II
Lockheed C-130 Hercules
Thunder Tiger Raptor 30 v2 RC helicopter
North American X-15
Lancair Evolution
McDonnell Douglas KC-10 Extender
Boeing 747-400 and 747-100
Robinson R22 Beta helicopter
Boeing B-52G Stratofortress
Bombardier Canadair CL-415
Viggen JA37
F-4 Phantom II
Bell 206 helicopter
Space Shuttle Orbiter
Great Planes PT-60 RC plane

Of course, the thousands of aircraft available on the Internet provide even greater variety. The following is a (small) sample of what's out there:

Beechcraft Bonanza
Mooney M20J 201
de Havilland DH-106 Comet
Sikorsky S76
P-51D Mustang
Beechcraft King Air 350
Cessna C150
Douglas A-4B Skyhawk
Fiat CR.42 Falco
Bell 407
Beechcraft Staggerwing
Ford Tri-motor
Hawker Sea Harrier FRS1
Boeing 727/737/747/787
Piper PA-16 Clipper
Pitts "Mountain Dew" S2C
StratoCloud Ram-Air
Piper Twin Comanche PA30
Cessna 195
Bell 222
Ilyushin IL-76
Paris Jet III
Peregrine F222 Firenze
Curtis P-6 Hawk
Cessna 120
Airbus A320/A340/A380

1.3 About the Versions of the X-Plane Simulator

X-Plane can be used in a wide array of situations, ranging from home use to commercial flight training. The standard installation of X-Plane is X-Plane 10 Global, and it is perfect for almost all home users. Situations that go beyond the standard home use (including use in commercial simulators) require the purchase of a USB "key" (a simple flash drive) that is used to unlock the features of X-Plane Professional.

Note that FAA certification of a simulator requires not only that the user has X-Plane 10 Professional but also the appropriate hardware (cockpit and flight controls) available through companies like Precision Flight Controls and Fidelity. This is because flight-training systems can only be certified as a complete package (a software and hardware combination). The commercial, FAA-certifiable software is available for $750 to $1,000 per copy and the hardware runs from $5,000 to $500,000. The retail version of X-Plane purchased at X-Plane.com is *not* certified for flight training right out of the box, since certification requires a software and hardware combination. However, the software available for about $80 at X-Plane.com is almost identical what is found in the $500,000 full-motion, FAA-certified platforms. The biggest difference is that the FAA-certified versions have custom aircraft files with larger instrument panels, which are set up to work with hardware radios like those found in the physical cockpits. The FAA-certifiable version also has some of the purely fun stuff (like space flight) removed even though those situations are simulated accurately in X-Plane, just like the FAA-certified subsonic terrestrial flight.

1.3.1 X-Plane 10 Global

The standard X-Plane simulator is the retail copy of X-Plane. It requires one X-Plane 10 Disc 1 DVD for each copy of X-Plane on the network.

This simulator is what users get when they purchase X-Plane from the X-Plane.com site and use it for whatever they desire. It requires no USB key to be plugged in. Many copies of X-Plane on many computers can be networked to act as external visuals, external cockpits, instructor stations, and the like. One X-Plane Disc 1 DVD is required for each computer networked together running the simulator. This system *cannot* be certified by the FAA or any other authority for logging flight training, due to the fact that it does not self-test for the presence of flight controls or a usable frame rate. However, since only one X-Plane Disc 1 DVD is needed for each computer, this setup is amazingly affordable and easy to assemble at almost no cost, even though a user could never *certify* the system.

1.3.2 X-Plane 10 Regional

Unlike X-Plane 10 Global, the X-Plane 10 Regional discs include only part of the world's scenery (e.g., Europe or North America). These versions of X-Plane are available at a lower cost than the X-Plane 10 Global distribution. Apart from the scenery, however, X-Plane 10 Regional is identical to the Global distribution, the version sold at X-Plane.com.

1.3.3 X-Plane 10 Professional

This version of X-Plane is for commercial use, FAA-approved simulators, and the EFIS App. It requires one X-Plane Professional USB key for each copy of X-Plane or EFIS App on the network.

This is similar to the X-Plane 10 Global simulator, but it adds EFIS App, a standalone program that runs on its own computer that gives a very realistic Avidyne primary flight display (PFD) and modular flight deck (MFD). All that is required to run this is a copy of X-Plane or EFIS App from X-Plane.com and a Professional key for each computer that will be networked into the simulator. Of course, *two* monitors can be hooked up to *one* computer running EFIS App so that one only has to buy one computer to run both the Avidyne PFD and MFD, which will save some money.

Furthermore, this key enables X-Plane to drive real Garmin G430 and G1000 GPS units. Note that in order to interface with a real G430 or G1000, users must get a Simulator G430 or G1000 from Garmin, then make the wiring harnesses to plug them in to the serial or Ethernet cables to the computer. Users unsure on how to do this are better off buying a simulator boxed and ready to go from Precision Flight Controls. PFC does provide ready-made units with real G430s and G1000s installed and running.

Additionally, this is the key that needs to be used for commercial purposes and FAA-approved simulators for flight training. It gives a Commercial Use message as X-Plane starts up, causing X-Plane to check for flight controls and self-test the frame rate, as required for FAA certification.

Finally, this key enables cylindrical and spherical projections.

This is the option designed to replace Microsoft ESP.

Note that the Professional key, along with the simulator itself, can be purchased from X-Plane.com's Ordering page. EFIS App can be downloaded from the X-Plane.com site. USB key drivers for both Mac OS and Windows can be downloaded from the X-Plane.com site. Run those installers to make X-Plane recognize the USB keys.

Chapter 2

Quick Start Guide

This chapter is designed to allow a first-time X-Plane user to get the simulator up and running in as short a time as possible. The goal is to be in the air and flying within ten minutes of completing the installation while still learning the essentials of the simulator.

This chapter will gloss over a great deal of background information, and configuration of many non-essential options will be skipped entirely. It assumes that the computer X-Plane is being installed on is capable of running the simulator with its default rendering options. Note that the minimum system requirements to run X-Plane are a 2 GHz processor, 2 GB of RAM, and a DirectX 9-capable video card with 128 MB of on-board, dedicated video RAM (VRAM). However, the recommended specifications are a 3 GHz multi-core processor, 4 GB of RAM, and a DirectX 10-capable (DirectX 11 preferred) video card with 1 GB of on-board, dedicated VRAM. X-Plane will take advantage of as many cores or distinct processors as you can afford. Having 16 cores split among 4 CPUs is not required by any means, but Version 10 would be able to use every one. No more than 4 GB of RAM is necessary, but the more VRAM you have, the better—X-Plane 10 can easily use 1.5 GB of VRAM at the maximum settings.

Where the process differs between installing on Windows and Mac OS X, the differences have been noted.

After getting off the ground initially, you may want to continue reading the full manual, or simply keep it for reference. If you have any issues while following this guide, check the rest of the manual—the problem is very likely addressed there, and you'll save time for both yourself and customer support.

Detailed information on installing and configuring X-Plane can be found in Chapters 3 and 4. Detailed information on joystick configuration can be found in Chapter 4, and Chapter 5 contains more information on setting up and flying the aircraft.

2.1 Installing X-Plane

Before installing, we recommend uninstalling any old or demo versions of X-Plane. You can do this by simply dragging the old X-Plane folders to your Recycle Bin (called Trash in Mac OS X).

1. Insert the first X-Plane DVD into your DVD-ROM drive and wait for it to spin up.

   If you are using the earliest set of X-Plane 10 discs (printed around November 2011), download the updated X-Plane installer from our web site. Launch *that* installer rather than the one on your installation DVDs, then skip to step 3.

2. In Windows, if the operating system does not launch the X-Plane installer automatically, click the Start menu, then My Computer. Double click on the XPLANE10 DVD, then Installer_Windows.exe.

   Mac users will need to double click on the X-Plane DVD icon on the desktop, then double click the Installer_Mac.app to launch the installer.

3. When the installer window appears, click **Continue** to begin the installation process.

4. By default X-Plane will install to the Desktop. Though it can be installed elsewhere, it is strongly recommended that it be placed on the Desktop so that it can be found in the future. For the purposes of this guide, we will assume it is installed there. Click **Continue**.

5. Accept the user agreement and click **Continue** once again.

6. Select the scenery you would like to install. Depending on the installer on your disc, either all of the world or none of it will be selected by default. An unselected tile will appear bleached in color, while a selected tile will have its full color (as all tiles do in Figure 2.1).

Figure 2.1: All scenery selected for installation after clicking "Select All" [Full size →]

   If you are unsure what areas are currently selected, just click **Select None** to turn everything off (as seen in Figure 2.2). From there, select the individual tiles you would like to install by clicking on them. Additionally, you can click and drag to select large areas quickly.

   Note that for regions where no scenery is installed, only oceans and airports will be visible. When you're finished selecting scenery, click **Continue** to begin installing.

   For the purposes of the **??** section later in this guide, be sure to select the two tiles that make up America's West Coast, as we will be traveling to Los Angeles International Airport (KLAX).

7. The installer will begin displaying its progress. When the installer prompts you to do so, remove the current disc and insert the next. Note that installation may take anywhere from

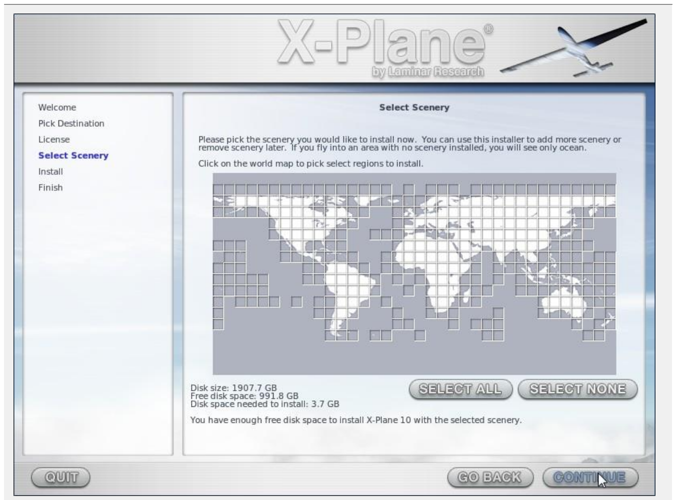

Figure 2.2: No scenery selected for installation after clicking "Select None" [Full size →]

thirty to sixty minutes per disc, and that only one X-Plane disc can be in the system at once (the installer wont recognize a disc placed in a second DVD-ROM).

Installing the complete scenery package will consume about 75 GB of hard drive space and will take between five and six and a half hours to install.

Scenery can be added or removed at any point in the future by inserting Disc 1 and re-running the installer. When the X-System installer comes up saying "You already have X-Plane 10 installed on this computer," click the **Add or Remove Scenery** button and proceed just like in step 4 above.

Note: Having finished the installation, Mac users will probably want to exclude their X-Plane installation directory from their Time Machine backups (as described in Chapter 3, in the section "Special Considerations for Mac Users.")

2.2 Launching X-Plane

1. Make sure your USB joystick is plugged in. If this isn't plugged in prior to launching X- Plane, the simulator will not be able to interface with it. To avoid any possible problems, it is recommended that the flight controls be plugged directly into the machine rather than into a hub.

2. Put Disc 1 into your DVD-ROM drive. Starting X-Plane without this will force X-Plane to run in demo mode only.

3. Open the X-Plane 10 folder (located by default on the Desktop) and double click on "X- Plane.exe" in Windows, or "X-Plane.app" on a Mac.

Figure 2.3: Selecting Joystick & Equipment from the Settings menu [Full size →]

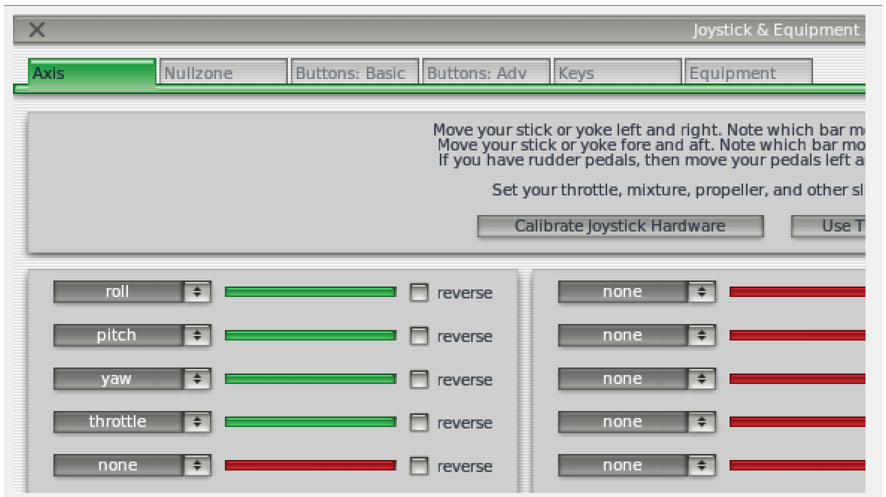

Figure 2.4: The relevant portion of the Joystick & Equipment dialog's Axis tab [Full size →]

2.3 Configuring Essential Yoke/Joystick Functions

Note that a mouse may be used to fly if neither a yoke or a joystick is available, though it will (of course) be unrealistic and cumbersome. If the mouse will be used, however, skip to the section "**??**" below.

1. Once the program loads, move your mouse to the top of the screen, causing the menu to appear.

2. Click on Settings (per Figure 2.3), then Joystick & Equipment. The relevant portion of the dialog box that appears is shown in Figure 2.4.

3. Move your joystick or yoke forward and back. A green or red bar should move as you do so. Click the drop-down menu next to it and set it to pitch. Do not check the reverse box next to this control unless, when flying, the aircraft's pitch control is working backward.

4. Move your joystick/yoke left and right. The green or red bar that moves should be set to roll. Do not check the reverse box next to this control unless, when flying, the aircraft's roll control is working backward.

5. Twist your joystick (if applicable). The bar that moves should be set to yaw. If you do not assign a yaw axis, X-Plane will attempt to stabilize it for you. Once again, do not check the reverse box unless, when flying, the aircraft's yaw control is working backward.

   If you are using rudder pedals instead of a twisting joystick, slide them forward and backward and set the green/red bar that moves then to yaw.

   Additionally, only when using rudder pedals, press the left pedal down with your toes. The green or red bar that moves should be set to left toe brake. Do the same for the right pedal, and set that green bar to right toe brake. If this is done, you may also skip steps 8 through 10 below.

6. Move your throttle forward and back (on a yoke, this is typically the leftmost lever). Set this bar to throttle. Check the reverse box only if, when flying, the aircraft's throttle control works backward.

7. Move all the joystick's control axes (that is, pitch, yaw, roll, and throttle) through their full range of motion to calibrate the controls.

8. Once again, skip this step and steps 9-10 if the rudder pedals are set up as toe brakes. Click the Buttons: Basic tab at the top of the screen.

9. Press the button on your joystick that you would like to assign to brakes, then release it.

10. Using the mouse, click the round button to the left of **Toggle brakes regular effort** (found near the bottom of the second column and already selected in Figure 2.5).

11. Close the Joystick & Equipment menu with either of the X buttons at the top of the screen, or by pressing the Enter key on your keyboard.

2.4 Setting Up a Flight

As of X-Plane 10.10, the first thing you see when you launch X-Plane (unless you disable it) is the Quick Flight screen, as seen in Figure 5.1. If you don't see this screen, you can open it by moving your mouse to the top of the screen (causing the menu to appear), then clicking File, then clicking Quick Flight Setup. This screen combines miniature versions of the dialogs which are used to open aircraft, choose an airport, and set up the weather.

Choose an airport from which to take off by using the upper-left box in this window. You can either type the airport's name or identifier in the text box to search for it, or scroll through the full list. Click on an airport to select it.

To the right of the airport selection is a box displaying your X-Plane directory. This is used, in combination with the "cover flow"-like view in the bottom left of the window, to select an aircraft. By selecting the X-Plane 10 folder, or the Aircraft folder, you will be able to scroll through all the aircraft you have installed. Clicking on a more specific folder will expand it, and the cover flow view will show you only the aircraft in that folder. The frontmost aircraft in the cover flow is the one which is selected.

For the purposes of this guide, select the Cessna 172 by clicking the Aircraft folder (thus displaying all the aircraft), then using your mouse's scroll wheel to scroll to the 172.

Set the time of day and weather using the rightmost boxes. Click on one of the rectangular panels to select the time of day and weather conditions shown in that panel. By checking the **always track real date and time** box will make the time in the simulator match your computer's time. Checking the **use real weather** will cause X-Plane to occasionally download the real-world weather in your aircraft's location.

Finally, when you've finished setting up the flight, press the **Fly with these options** button.

2.5 Getting Off the Ground

Once again, these instructions are written for the Cessna 172—flying an airliner or another heavy aircraft will require flaps/slats, a great deal more speed, and a very different technique, all of which is beyond the scope of this chapter.

Figure 2.7: The airspeed indicator in the Cessna 172 [Full size →]

1. The airplane's engine is already running. Press the button that was assigned to brakes when the joystick/yoke was configured. If no button was configured (e.g., if you are flying with the mouse), press the 'b' key on the keyboard.
2. Move the throttle all the way up.
3. If applicable, use the joystick's twist or the rudder pedals to control the plane's left and right motion to track the centerline of the runway (don't worry if you go off it—you'll still get up to speed for take off). If no yaw axis was configured above (or if using the mouse), the simulator will attempt to control the yaw for you.
4. Watch your airspeed indicator (seen in Figure 2.7), and when it hits 60 knots, pull back slightly to get the plane off the ground.

   If using a mouse, you will have to click the white + sign (found near the center of the screen) with the mouse in order to grab the controls with the mouse. From there, move the mouse within the white box that appears in order to control the aircraft's flight— moving it up within the box will pitch the nose down, and moving the mouse down will pitch the nose up. Moving it left within the box will cause the craft to roll left, and moving it right will cause the craft to roll right. Click the mouse again to release the controls, freeing you to open a menu, adjust controls on the aircraft panel, etc.
5. Gently level the plane off in order to build a little airspeed, then, when the plane hits, say, 80 knots, pull back again to begin climbing. Building airspeed this way will help to keep the plane from stalling.
6. Fly away!

2.6 Updating X-Plane

Updating X-Plane will ensure that the copy of X-Plane you are using is the most stable, most feature-rich version available. Updates within a given version of X-Plane (e.g., from Version 10.0 to 10.1 to 10.2) are free, and recommended for virtually all users.

1. In X-Plane, move your mouse to the top of the screen (causing the menu to appear) and click About.
2. In the About menu, click About X-Plane.
3. In the window that appears, there will be an **Update X-Plane** button if an update is available. Clicking this will cause X-Plane to download the latest update and run the updater for you.
4. The installation files will be downloaded and installed, after which you will be ready to fly.

2.7 Further Considerations

Among the more important options skipped in the guide above was the configuration of flap and trim switches. If your joystick or yoke has switches or buttons you would like to use for this purpose, you can configure them similarly to the brakes that we assigned in part 3 of this guide. The difference is that when using a switch, pressing it "up" assign it one function and pressing it "down" will assign it another. Remember to click the button on your joystick before trying to assign it a function. Further information on this can be found in the section "Configuring Flight Controls" of Chapter 4.

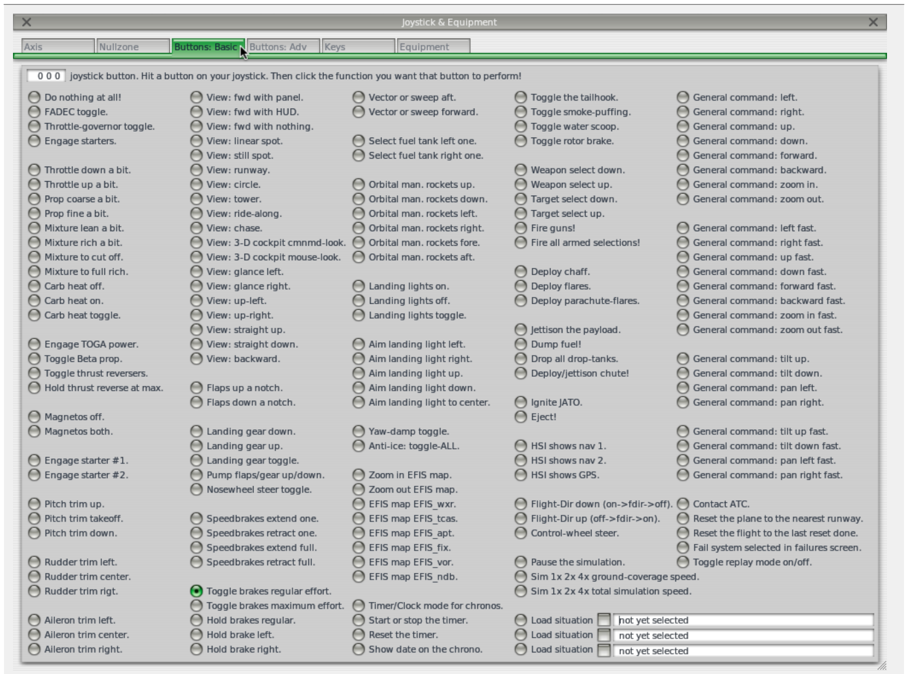

Figure 2.5: The Buttons: Basic tab of the Joystick & Equipment menu, with a button set to **Toggle brakes regular effort** [Full size →]

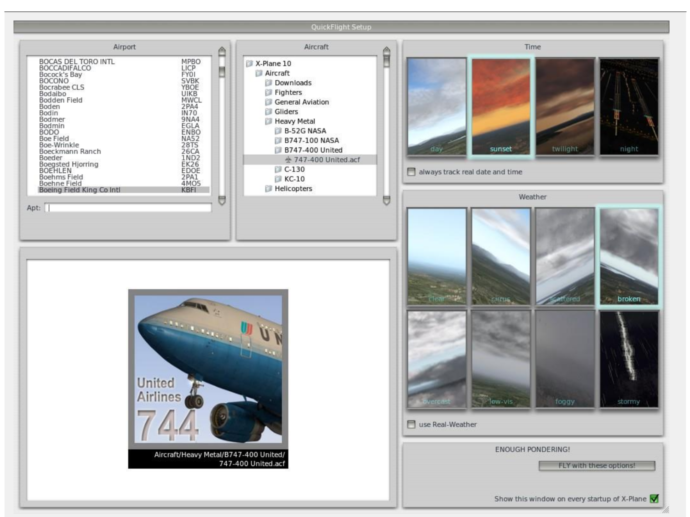

Figure 2.6: Setting up a quick flight upon launching X-Plane [Full size →]

Chapter 3

Preparation and Installation

3.1 System Requirements

Given X-Plane's incredible capabilities and accuracy, it is not possible to run a current release of X-Plane on an exceptionally old computer. A good rule of thumb is that any machine built in the last 18 to 24 months will probably be able to run the simulator acceptably. Computers up to about 36 months old may be fine if they were top-of-the-line machines when manufactured. Even if they weren't, X-Plane may still be able to run, albeit with its rendering options turned down.

X-Plane 10 requires a computer with *at least* the following specifications:

- A 2 GHz, dual-core processor,
- 2 GB of RAM (physical memory),
- a DirectX 9-capable video card with 128 MB of on-board, dedicated video RAM (VRAM),
- 10 GB of hard drive space, and
- a DVD-ROM drive.

However, for the best experience, we recommend the following:

- a 3 GHz, multi-core CPU (or, even better, multiple processors),
- 4 GB of system RAM (physical memory), and
- a DirectX 10-capable (DirectX 11 preferred) video card with 1 GB of on-board, dedicated VRAM, and
- 10 GB of hard drive space, and
- a DVD-ROM drive.

To find your computer's CPU speed and amount of RAM, Mac users can simply open the Apple Menu and click "About This Mac."

For Windows Vista and Windows 7 users, you can open the Start menu and type System to search for the Control Panel's "System" item. Opening this will display the processor, its speed, and the amount of RAM installed. Windows XP users can get the same information by:

1. Opening the Start menu,
2. Selecting the Control Panel,
3. Clicking Performance and Maintenance, and
4. Clicking System.

Additionally, X-Plane 10 has been optimized for dual- and quad-core processors, as well as multiprocessor systems—some CPU cores can be used for the flight models of the simulated aircraft, others for loading scenery, taking input, etc.

Note: X-Plane 10 does not support PowerPC-based Macs, or versions of OS X prior to 10.6.8.

3.1.1 Display Hardware

X-Plane can display on any screen, with resolutions ranging from 1,024 x 768 pixels to 9,999 x 9,999 pixels. It makes no difference to X-Plane what aspect ratio your screen has; if your aspect ratio doesn't match that of the instrument panel you are using, X-Plane will simply zoom or stretch the panel as appropriate to fill your screen.

X-Plane allows the use of any number of screens to depict anything you like. Multiple computers can be used to drive multiple monitors, thereby networking up to about 20 screens to show any combination of views imaginable. If your computer's graphics card is especially powerful, technology like AMD's Eyefinity (built in to high-end Radeon cards since 2009) or a video splitter (like the Matrox TripleHead2Go) can be used to drive three forward visuals with one machine. In that case, a second machine could be used to drive the cockpit display and/or IOS, as described in the section "Configuring a Multi-Monitor Simulator" of Chapter 9. Of course, X-Plane only *requires* a single monitor to function.

3.1.2 Graphics Drivers

X-Plane, of course, needs a decent graphics card in the computer you wish to run it on. Essentially any modern, discrete (i.e., non-integrated) video card will do just fine, though a more powerful, more expensive graphics card will allow for higher detail in the simulator's graphics. Just as important as the graphics card itself, though, are the computer's graphics *drivers* (essentially, the instructions that let X-Plane know how to use your graphics card).

On many systems the required graphics drivers will already be installed. However, it may be necessary to periodically update the computer's video drivers, either to fix a problem or to get the very best performance the system can deliver. Users of ATI/AMD video cards can download drivers from the AMD web site, and NVIDIA users can download drivers from NVIDIA's web site. Before updating the graphics driver, we recommend installing and launching X-Plane (per the section "Installing X-Plane" of this chapter) and seeing how it runs. If any of the following problems are experienced, the system's graphics drivers probably need to be updated:

- a screen consisting only of splashes of color
- a screen with horizontal or vertical bars running through it
- random images of various pieces of the airplane or instrument panel

Additionally, if an error appears referring to a corrupt or missing ".dll" file, the drivers most likely need to be replaced.

3.1.2.1 Updating Graphics Drivers in Windows

A high percentage of Windows-based computers are operating with drivers that are out of date or that do not currently support OpenGL (caused by using the default Windows drivers rather than those of the manufacturer). If you conclude that your graphics drivers need to be updated, the following (general) steps should guide you through the process.

1. Go to your video card manufacturers driver download page (ATI's site or NVIDIA's) and download the latest drivers, being sure to save it to a place that you'll be able to find it (for example, the Desktop).
2. Uninstall your old graphics drivers.
   (a) Click on the Start menu and open the Control Panel.
   (b) Click either **Add or Remove Programs** (in Windows XP) or **Uninstall a program** (in Windows Vista and 7).
   (c) Scroll down to either the Catalyst Display Driver (for AMD/ATI video cards) or the NVIDIA Drivers (for NVIDIA cards).
   (d) Click the **Change/Remove** button. (This may be replaced by a Remove button only; it does not affect the process.)
   (e) Follow the instructions provided by the uninstaller and reboot if necessary.
3. After rebooting, find the driver file that was downloaded in Step 1 and double click on it. The steps vary from here depending on the type of graphics card, but we will continue with a general outline for all companies.
4. Choose a destination folder to extract the files to. Again, make it something easy to find like `C:\video drivers\` and continue clicking **Next**, **Install**, etc.
5. If the installer (which you just extracted in Step 4) does not run automatically, navigate to `C:\video drivers` and double click on setup.exe or a similar launch file.
6. Agree to the license agreement, choose the "express" installation, and click **Next** (or its equivalent) until the installation finishes.
7. Reboot your PC and you're ready to fly!

3.1.2.2 Graphics Driver Requirements in Linux

When running X-Plane in Linux, please note that you must install the proprietary Nvidia or AMD drivers. X-Plane will not run using Gallium or Mesa open-source drivers.

3.2 Selecting Flight Control Hardware

While it is physically possible to fly X-Plane with only the mouse and keyboard, this can be cumbersome and unrealistic (for obvious reasons). While instructions for flying this way are included in the section "How to Fly" of Chapter 5, it is strongly recommended that users fly with at least a joystick for a realistic experience.

So which joystick should a user purchase? Every USB joystick and yoke made in the last 10 years or so will work with X-Plane, but, as with most things in life, you get what you pay for. Be leery of joysticks advertised for $29.95 at a local retailer. In our experience the cheaper hardware typically does not last as long or work as well as more moderately priced equipment.

Note: X-Plane can only interface with USB devices. This covers nearly all the controllers manufactured in the last ten years, but if you have a non-USB device, an adapter will be needed to change it to a USB input.

3.2.1 Joysticks

Joysticks typically provide pitch, roll, and throttle control, as well as a few buttons that can be programmed to do different things. For example, you may program one button to raise and lower the landing gear, and two additional buttons to raise the flaps and lower them. Also, some joysticks can have their handle twisted left and right to control yaw movement. If the joystick being used does not offer yaw control, you will probably want a set of rudder pedals to provide realistic yaw control in the airplane. A joystick will be best for flying fighter or sport airplanes, or planes made by companies like Airbus, Cirrus, or Lancair, for the simple reason that those planes, in reality, are controlled with joysticks!

3.2.2 Yokes

A yoke consists of a steering wheel-like control that rotates left and right and also slides back and forth. These are the best option for users primarily interested in flying older-style general aviation planes, business jets, and non-Airbus airliners, since these planes are flown with yokes in reality.

Yokes are typically clamped to the user's desk for stability. They may have a built-in throttle quadrant, which will allows for independent control of the propeller, throttle, and mixture for a single propeller engine. Also, note that yokes do not control yaw movement (they do not twist left and right for yaw control like some joysticks), so rudder pedals are required for realistic yaw control.

3.2.3 Rudder Pedals

Rudder pedals allow users to realistically control the airplane's yaw by pushing the left or right pedal to turn. While in flight, the pedals control the rudder, whereas on the ground they're used to steer. The pedals also control the brakes to help the airplane stop or turn sharply while on the ground. (Push the top of the left or right pedal to activate the brakes on that side of the plane.)

If neither a set of rudder pedals nor the joystick is set to control yaw, X-Plane will automatically slew the rudder to try and keep the airplane flying true. This auto-rudder function, however, is not smart enough to take off or land properly in a crosswind, slip, or do various other things that rudders might be used for. For this reason, rudder pedals (or at least a twisting joystick) are highly recommended.

Please note that, when flying a helicopter, pedals must be used for the anti-torque controls—this can not be assigned to keyboard commands, simply because it is not practical to try to use the keyboard to fly.

3.2.4 Other Considerations

For added realism in certain situations, you may want an independent throttle quadrant. CH Products' Multi-Engine Throttle Quadrant is perhaps the most popular and offers independent and variable control of six different functions. Normally, this would be set up to control the throttle, propeller, and mixture controls for each engine on a twin-engine airplane. This controller can also be used to control throttle and condition (fuel cutoff) for jet engines, allowing independent control of jet aircraft with up to three engines. A multi-engine throttle quadrant is recommended for users interested in realistically flying airplanes with more than one engine.

To purchase joysticks or other equipment, check out the CH Products, Logitech, or Saitek websites. Each of the sites allows users to browse the available products and find where to buy them. Also, feel free to call or e-mail X-Plane customer support (info@x-plane.com) with any additional questions.

Note that instructions on configuring flight control hardware are found in Chapter 4, in the section "Configuring Flight Controls".

3.3 Installing X-Plane

In order to avoid confusion, be sure to delete any installations of the X-Plane demo, or older versions of X-Plane, before installing the full version from the DVDs. (Uninstalling the demo is as straightforward as locating the "X-Plane 10 Demo" folder and moving it to the Recycle Bin/Trash.)

Note: If you are using the earliest set of X-Plane 10 discs (printed around November 2011), you will need to download an updated X-Plane installer from X-Plane.com and launch *that* rather than the installer on your discs.

3.3.1 Installation on a Windows PC

To install X-Plane on a Windows-based computer, do the following:

1. Insert Disc 1 of the X-Plane installation DVDs into your DVD-ROM drive and wait for it to spin up.

   If you are using the earliest set of X-Plane 10 discs (printed around November 2011), download the updated X-Plane installer from our web site, then skip to step 3.

2. If the X-System window doesn't open automatically, open My Computer and navigate to the drive now labeled "X-Plane 10" (usually the D: drive). If the X-System window *does* appear automatically, skip to step 4.

3. Double-click on Installer_Windows.exe to launch the X-Plane installation.

4. When the installer window appears, click **Continue.**

   Note that if the buttons at the bottom of the X-System screen labeled **Quit**, **Go Back**, and **Continue** are not visible, then the system is probably running at a minimal resolution like 800 x 600. Using this resolution will not allow the computer to display the bottom of the X-Plane screen and you will need to force the installer to exit (via Ctrl+Alt+Del) and increase the screen's resolution in Windows to at least 1024 x 768.

5. By default, X-Plane will install to the Desktop. Though it can be installed elsewhere (by clicking the **Change Destination** button), it is strongly recommended that it be placed on the Desktop so that the folder can be found in the future. When an acceptable location has been selected, click **Continue**.

6. Accept the user agreement and click **Continue** once again.

7. Select the scenery you would like to install. Depending on the installer on your disc, either all of the world or none of it will be selected by default. An unselected tile will appear bleached in color, while a selected tile will have its full color (as all tiles do in Figure 3.1).

   If you are unsure what areas are currently selected, just click **Select None** to turn everything off (as seen in Figure 3.2). From there, select the individual tiles you would like to install by clicking on them. Additionally, you can click and drag to select large areas quickly.

   Note that for regions where no scenery is installed, only oceans and airports will be visible. When you're finished selecting scenery, click **Continue** to begin installing.

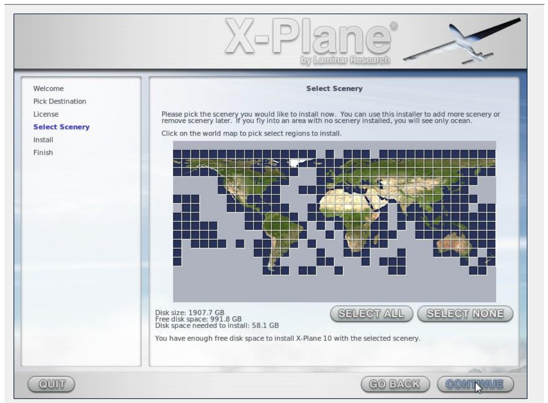

Figure 3.1: All scenery selected for installation after clicking "Select All" [Full size →]

Figure 3.2: No scenery selected for installation after clicking "Select None" [Full size →]

8. The installer will begin displaying its progress. When the installer prompts you to do so, remove the current disc and insert the next. Note that installation may take anywhere from thirty to sixty minutes per disc, and that only one X-Plane disc can be in the system at once (the installer won't recognize a disc placed in a second DVD-ROM). Installing the complete scenery package will consume about 75 GB of hard drive space; doing so will take between five and six and a half hours.

9. When the installation completes, reinsert Disc 1 and go fly!

At any point in the future, scenery can be added or removed by inserting Disc 1 and re-running the installer. When the X-System installer comes up saying "You already have X-Plane 10 installed on this computer," click the **Add or Remove Scenery** button and proceed just like in step 7 above.

3.3.1.1 Special Considerations for Windows XP Users

Running X-Plane on Windows requires Microsoft DirectX 9.0c (or later) to be installed. Without this, X-Plane cannot interface with audio and joystick hardware. This free software can be downloaded from Microsoft's DirectX 9.0c Runtime Installer page. All newer installations of Windows XP have DirectX 9 already, and all copies of Windows Vista and Windows 7 have DirectX 10 (which is more than sufficient) installed by default.

To find out which version of DirectX is currently installed in Windows XP, do the following:

1. Open the Start menu and click Run, or press Windows + R on the keyboard.
2. Type "dxdiag" and press Enter.
3. If a box appears asking if you want to check for signed drivers, click **No**.
4. The lower half of the window that appears is labeled System Information. At the bottom of that list of stats is the system's DirectX Version.

3.3.1.2 Special Considerations for Windows Vista and 7 Users

Some of X-Plane's menus may render strangely when using the default Aero themes in Windows 7 and Windows Vista. For this reason, it is recommended that users switch to the Basic theme when running X-Plane.

To make Windows automatically switch to the Basic theme when you launch X-Plane (and switch back when you're done), do the following:

1. Locate either the X-Plane.exe file (found in the X-Plane 10 installation folder) or the shortcut you use to launch X-Plane and right click on it.
2. Click Properties from the menu that appears.
3. Go to the Compatibility tab and check the **Disable desktop composition box**.

With that done, X-Plane will launch with the Basic theme and all menus will render correctly.

3.3.2 Installation on a Mac

To install X-Plane on a Mac, do the following:

1. Insert Disc 1 of the X-Plane installation DVDs into your DVD-ROM drive and wait for it to spin up.

   If you are using the earliest set of X-Plane 10 discs (printed around November 2011), download the updated X-Plane installer from our web site, then skip to step 3.
2. Double click on the X-Plane DVD icon on the Desktop.
3. Double click the "Installer Mac" app to launch the installer.

   Note: If the buttons at the bottom of the X-System screen labeled **Quit**, **Go Back**, and **Continue** are not visible, then the system is probably running at a minimal resolution like 800 x 600. Using this resolution will not allow the computer to display the bottom of the X-Plane screen and you will need to force the installer to exit (via the Option + Command + Escape keys) and increase the screen's resolution to at least 1024 x 768.

4. By default, X-Plane will install to the Desktop. Though it can be installed elsewhere (by clicking the **Change Destination** button), it is strongly recommended that it be placed on the Desktop so that the folder can be found in the future.

5. Accept the user agreement and click **Continue** once again.

6. Select the scenery that should be installed. Depending on the installer on the disc, either all of the world or none of it will be selected by default. An unselected tile will appear bleached in color, while a selected tile will have its full color. If you are unsure what areas are currently selected, just click **Select None** to turn everything off. From there, select the individual tiles to install by clicking on them. Additionally, you can click and drag to select large areas quickly.

   Note that for regions where no scenery is installed, only oceans and airports will be visible. When you're finished selecting scenery, click **Continue** to begin installing.

7. The installer will begin displaying its progress. When the installer prompts you to do so, remove the current disc and insert the next. Note that installation may take anywhere from 30 to 60 minutes per disc, and that only one X-Plane disc can be in the system at once (the installer won't recognize a disc placed in a second DVD-ROM). Installing the complete scenery package will consume about 75 GB of hard drive space; doing so will take between five and six and a half hours.

8. When the installation completes, reinsert Disc 1 and go fly!

Additionally, scenery can be added or removed at any point in the future by inserting Disc 1 and re-running the installer. When the X-System installer comes up saying "You already have X-Plane 10 installed on this computer," click the **Add or Remove Scenery** button and proceed just like in step 6 above.

3.3.2.1 Special Considerations for Mac Users

By default, Mac OS X versions 10.5 (Leopard) and greater are set to automatically back up the entire hard drive using Time Machine. This includes a user's X-Plane directory. Most people would prefer not to have this backed up, due to the fact that it requires a significant amount of space on the backup disk (for something already backed up to DVDs, no less) and the fact that it takes a great deal of time to complete the backup.

For this reason, it is recommended that users exclude the X-Plane directory from Time Machine's backup, either during or shortly after the X-Plane installation, by doing the following:

1. Open the Time Machine preferences, either from the task bar (by clicking the Time Machine icon and selecting "Open Time Machine Preferences") or from the System Preferences (by clicking the Time Machine icon there).

2. With the preferences open, click the **Options...** button.

3. Click the **+** icon to add a folder to the list of excluded directories.

4. Select the X-Plane installation directory (located by default on the Desktop) and click **Exclude**.

5. Exit the Time Machine preferences.

Additionally, some users have had issues with Time Machine creating a "locked" copy of their X-Plane discs. This can cause the X-Plane Disc 1 to appear in Finder as Disc 2, thus forcing X-Plane to run in demo mode. The issue seems to have disappeared in the latest versions of OS X. To correct the problem if it does occur, however, do the following:

1. Download and install the version of the OnyX system utility appropriate to your version of OS X.
2. Run OnyX and select the Parameters tab.
3. Select Finder from the OnyX menu bar and then select **Show hidden ftles and folders** from the Misc Options section.
4. Open Finder and click on "Macintosh HD" (or whatever your installation disk is called). The Volumes directory, which was hidden before, is now visible at the bottom.
5. Go into the Volumes directory and delete the unwanted X-Plane volumes by moving them to the Trash.
6. Eject the X-Plane DVD, empty the Trash, and reboot.
7. After rebooting, the system should be ready to fly as normal using X-Plane's Disc 1.
8. At this point, Onyx may be reopened to turn off the **Show hidden ftles and folders** option.

3.3.3 Installation on a Linux PC

For the most up-to-date instructions on installing X-Plane in Linux, please see the Linux category on the X-Plane Wiki.

3.4 Launching X-Plane

Unlike many of the programs you may be familiar with, X-Plane does not create shortcuts to itself across your hard drive. We recommend launching X-Plane by opening the X-Plane 10 installation directory (located by default on the Desktop) and double-clicking the X-Plane icon. However, if you would like, you can create a shortcut (called an alias in OS X) by doing the following:

1. Open the X-Plane installation directory (located by default on the Desktop).
2. In Windows, right-click on the X-Plane.exe icon and select Create Shortcut. In Mac OS, right-click on the X-Plane.app icon and select Make Alias.
3. Drag the shortcut wherever you wish to launch X-Plane from.

Chapter 4

Configuring and Tuning Your X-Plane Installation

Having installed X-Plane as described in the previous chapter, you can configure the simulator in a number of ways. These include downloading the latest free update (giving you the latest set of features available), setting up flight controls, and tuning the performance of the simulator both in terms of graphics quality and frame rate.

4.1 General Use of the X-Plane Interface

X-Plane has been written to operate on Windows, Macintosh, and Linux systems. For consistency's sake, the layout and appearance of X-Plane is the same across all three operating systems. This may be slightly different than the interface that users are accustomed to, but once they pass the learning curve, they generally find it easy to use.

Here are a few pointers to aid in the learning process:

- X-Plane's menu is hidden when the simulator is first launched. To access the menu bar, just move the mouse pointer to the top of the screen. When the mouse is within a centimeter or so of the top edge of the screen, the menu bar will appear. There is no keyboard command to access the menu bar.
- Any window within X-Plane can be closed by clicking either of the Xs found in the upper left and upper right corners. Alternatively, those windows may be closed by hitting the Enter/Return key.
- Key commands can be found by opening the Joystick & Equipment screen and going to the Keys tab. Key command assignments can also be changed using this screen (per the section "Configuring Keyboard Shortcuts" of this chapter) to anything you like. Also, note that many of the keyboard shortcuts are shown in the X-Plane menus. For example, opening the View menu will display the list of available views on the left side of the drop down menu, with the list of corresponding keyboard shortcuts on the right.

Like most programs, the simplest way to navigate around X-Plane is using the mouse, though there are many shortcut key commands to help you navigate quickly through the options after you become familiar with the program. These shortcuts are particularly important when using the mouse to fly. In that case, it is much easier to use the '2' key to drop a notch of flaps than it is to let go of the controls, reach down with the mouse to adjust the flaps, and then reach back up and grab the controls again.

Also note that most instruments and controls inside the cockpit are interactive, meaning that the mouse can be used to alter switches, set frequencies, manipulate the throttle(s), change the trim, etc.

4.2 Setting the Language

To change the language used throughout X-Plane, move your mouse to the top of the screen (causing the menu to appear) and click Settings. Then, click the Operations and Warnings menu item. In the dialog box that appears, select your language from the list in the box labeled "Language."

4.3 Updating X-Plane

The X-Plane simulator is designed for both realism and longevity. Maximizing both of these requires that X-Plane be updated often. Every few months, the we will make available a new update to the simulator. In between these official (or "stable") releases, users can download beta versions of the upcoming update. These are treated as a kind of "update in progress"—new features and bug fixes are included, but in the beta stage, the updates have not been fully tested in a range of situations. This means that they may create incompatibilities or create other problems that would not be experienced in the stable releases. For more information, see the section "Using the X-Plane Betas" below.

Newer versions of X-Plane often contain feature enhancements, bug fixes, stability improvements, aircraft and resource updates, flight model improvements, and even new feature additions.

A purchase of X-Plane entitles you to free updates through that full X-Plane version run. This means that if you purchase the Version 10 discs, you will get the Version 10.10 update, the Version 10.20 update, etc., all the way through Version 10.99 if it exists—all free of charge. Of course, you do not have to take advantage of these updates, but it is recommended that you do so.

As with the version of X-Plane on the DVDs you purchased, Disc 1 (the master disc) must be inserted into your computer to use these updated versions. X-Plane uses this as a "key" to unlock the software. Be sure to have the disc spinning in the DVD drive prior to starting up the program so that X-Plane can find it!

Note that although previous versions of X-Plane required users to have all the desired scenery installed before updating to a newer version, this is no longer the case. New scenery may be installed regardless of updates.

To update X-Plane, do the following:

1. Launch the copy of X-Plane that you wish to update.
2. Once it opens, move your mouse to the top of the screen and click About, then About X-Plane. The dialog box that appears will show both your version of X-Plane and the latest version available. If these differ, there will be an **Update X-Plane** button in the bottom right of the window.
3. Click the **Update X-Plane** button. X-Plane will automatically download the latest version of the updater program and launch it.
4. In the window that appears, please do not select the "Check for new betas" box unless you are prepared to potentially work with some kinks (per the section "Using the X-Plane Betas" below).

5. Click **Continue** to begin the program's scanning of your X-Plane directory. This allows it to determine which files need to be updated.
6. Assuming there is enough disk space to download the required updates, click **Continue** to begin the installation.
7. The installation files will be downloaded and installed. When the installation finishes, you're ready to fly.

4.4 Using the X-Plane Betas

The X-Plane beta updates are for users who want to help test the newest refinements to the X-Plane software. The advantage to doing so is that these users get access to the latest enhancements to the software (flight model refinements, new features, etc.). The downside is that there is a greater risk of encountering problems with third-party models or other general bugs. We recommend that most users stick to the stable version releases, as these are the ones known to "just work."

See the X-Plane Beta page for information on the current beta builds.

4.5 Uninstalling X-Plane

The X-Plane installer does not infest your hard drive with shortcuts and directories. Therefore, all it takes to uninstall the program is to delete the X-Plane installation folder (located by default on the Desktop) by dragging it to the Recycle Bin or Trash. After you empty the Recycle Bin/Trash, the program will be removed completely from your hard drive.

4.6 Configuring Flight Controls

When using a joystick or other hardware, the hardware must be plugged in *before* starting X-Plane. If it is not, X-Plane will not see the input devices.

With your flight controls plugged in and X-Plane running, you can configure how the simulator responds to input from each axis and button. Throughout this section we will refer to any input device as a joystick; the instructions apply to yokes, throttle quadrants, and rudders also.

4.6.1 Setting Up the Control Axes

In X-Plane, move the mouse to the top of the screen and click Settings, then select Joystick & Equipment, as seen in Figure 4.1. This will open the dialog box allowing you to configure and calibrate the flight controls. If it isn't already selected, click on the Axis tab at the top of the screen.

To begin, move the joystick's controls around to see how the axes are mapped in X-Plane. As this is done, one of the green or red bars will move for each input that is actuated. (Note that if you are using a trim wheel, you may have to roll the wheel continuously to see which axis it is mapped to.) Thus, when the stick is rolled left and right only one green or red bar will move; when it is pushed back and forth another bar will move. Each control's desired function is selected from the drop down box to the left of its bar.

The axis bars are green when they are assigned a function, and they are red when they are not assigned a function. For instance, before the throttle axis has been configured, moving the throttle might move a red bar. After assigning that bar to **throttle**, it will turn green.

Figure 4.1: Selecting Joystick & Equipment from the Settings menu [Full size →]

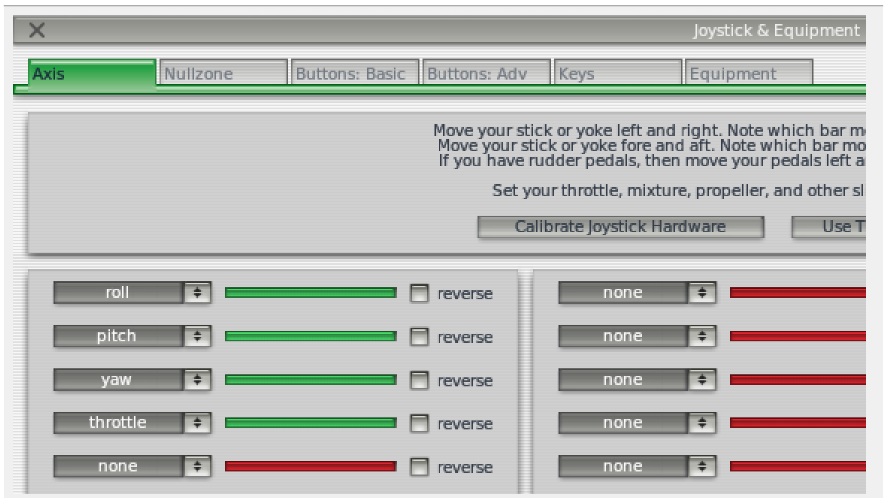

Figure 4.2: The relevant portion of the Joystick & Equipment dialog's Axis tab [Full size →]

The normal configuration of flight controls goes as follows:

1. Move your joystick or yoke forward and back, or spin your trim wheel continuously. A green or red bar should move as you do so. Click the drop-down menu next to it and set it to **pitch**. Do not check the **reverse** box next to this control unless, when flying, the aircraft's pitch control is working backward.

2. Move your joystick/yoke left and right. The green or red bar that moves should be set to **roll**. Do not check the **reverse** box next to this control unless, when flying, the aircraft's roll control is working backward.

3. Twist your joystick (if applicable). The bar that moves should be set to **yaw**. If you do not assign a yaw axis, X-Plane will attempt to stabilize yaw movement for you. Once again, do not check the **reverse** box unless, when flying, the aircraft's yaw control is working backward.

   If you are using rudder pedals, slide them forward and backward and set the green/red bar that moves then to **yaw**.

   Additionally, only when using rudder pedals, press the left pedal down with your toes. The green or red bar that moves should be set to **left toe brake**. Do the same for the right pedal, and set that green bar to **right toe brake**.

4. Move your throttle forward and back (on a yoke, this is typically the leftmost lever). Set this bar to **throttle**.

Note: Any green bar which is not actively controlled by your hardware *needs* to be set to none. When this is set, the bar will turn red, indicating that X-Plane is not using the axis.

4.6.2 Centering the Controls

With the control axes configured, you can tell X-Plane to treat your joystick's current position as the center of its travel by pressing the **Use this position as center** button. Using this button will allow you to correct for flight controls that don't return to the center of their range – for instance, a joystick that moves left to right in a range of 0 to 100, but returns to 55 when you lets go of it. Without centering such a joystick, the aircraft would constantly roll to the right.

4.6.3 Calibrating the Hardware

Some flight control hardware may send a signal from 0 to 1,000 when a user moves a given control from one limit to the opposite, while another device may send a signal (given the same movement of a user's hand or foot) from, say, -6,000 to 3,992. The only way for X-Plane to know the range of a given joystick's input is for the user to "teach" it.

All it takes to teach X-Plane how to interpret your joystick's signal—that is, to calibrate the joystick hardware—is to move all the axes of the joystick through their full range of motion while on the Axis tab of the Joystick & Equipment window. Be sure to move each of the joystick's variable controls (that is, all sliders, joysticks, rudders, etc.) through their full range of motion. Take them all the way forward, all the way back, left, and right. If you are using a trim wheel, roll it continuously through 10 or 15 revolutions in each direction. All of this can be done quite rapidly, as X-Plane can monitor all the different inputs at once.

4.6.4 Assigning Functions to Buttons

Each of the buttons and switches on the joystick can be assigned a function within X-Plane (for example, toggling the brakes or landing gear). To do this, open the Buttons: Basic tab of the Joystick & Equipment window. As you operate your joystick's buttons and switches you will see the box in the upper left corner change the number it displays. This indicates that X-Plane has received the input and is ready to assign that button/switch a function.

The instructions below reference only buttons. They apply, however, to switches too, though a switch can have a function assigned to both its "up" and "down."

To change a button assignment, simply operate that button on your joystick and then select the function that should be assigned to it by clicking on the circular toggle next to that function. For instance, in Figure 4.3, button 0 has been assigned to the "Toggle brakes regular effort" func- tion. Repeat this operation for as many buttons as need functions assigned. Close the Joystick & Equipment window and the settings will be saved.

Note: You must select the desired button by pressing and releasing it *prior* to assigning it a function. If this is not done, the assignment of the last button pressed will be overwritten.

To assign a function to a joystick beyond what is available in the Buttons: Basic tab, you can use the Buttons: Adv tab to assign any command function available to a button. As in the other tab, simply press the button you would like to assign, click on the command you would like to assign that button in the right half of the screen, and close the window.

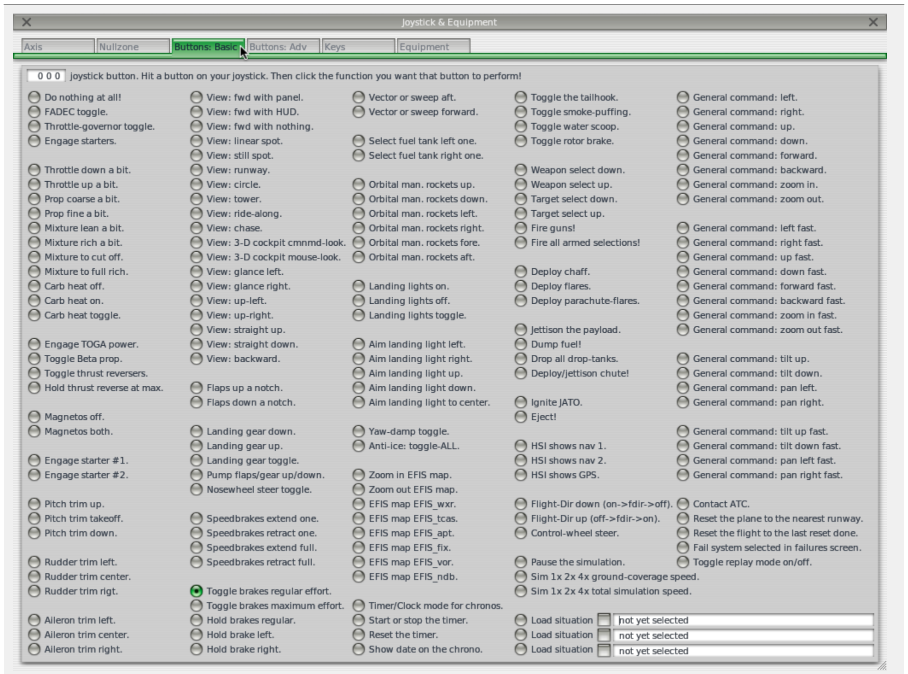

Figure 4.3: The Buttons: Basic tab of the Joystick & Equipment menu, with a button set to **Toggle brakes regular effort** [Full size →]

4.6.5 Controlling Joystick Sensitivity and Aircraft Stability

To modify the joystick's sensitivity or the stability of the aircraft, open the Nullzone tab at the top of the Joystick & Equipment screen. The three sliders in the upper right of this window control the response curves for the pitch, roll, and yaw axes of the joystick.

If these sliders are set all the way to the left, the aircraft's response to that axis' input will be completely linear. This means that a 50% deflection of the joystick will deflect the airplane's flight controls 50% of their travel. As these sliders are moved to the right the response becomes curved. In this case, a deflection of the joystick from center to its halfway point may only deflect the aircraft's controls by 10%. This will dampen any aircraft movements and desensitize the user's controls. Keep in mind, however, that in this case, the remaining 90% of the control surface deflection must take place in the last 50% of joystick movement. Thus, the controls will be dampened for the first half or so of their travel and then become hyper-sensitive for the remainder of their throw. This gives the user plenty of fine-tune control near the center of the flight control envelope to hold altitude and roll precisely, but still allows for full control authority at the extremes.

Try flying with the sliders in various different positions to see what setting works best.

In the upper left portion of the Nullzone screen is another set of sliders, labeled "stability augmentation." These control X-Plane's stability augmentation by damping the predicted forces acting on the aircraft's flight control surfaces. If these sliders are all the way to the left, then there is no stability augmentation of the aircraft. As the sliders are moved to the right, X-Plane will automatically add some stability augmentation to the aircraft, adding some elevator input to level the nose, some aileron input to minimize the roll rate, and some rudder input to counter any aircraft yaw rates. In other words, the simulator will try to make the plane easier to fly by adding control inputs for the user. The downside, of course, is that as X-Plane adds stability, the aircraft becomes less responsive (and less realistic).

4.6.6 Setting Null Zones

Null zones determine how much the joystick must be moved before X-Plane actually starts to take action. A null zone may be set for each joystick axis to fine-tune how responsive the control surface inputs are, but this function is typically used to prevent hardware from "creeping" in flight or to ignore the constant jittering that many older controllers will send to X-Plane.

To set a null zone, first open the Nullzone tab of the Joystick & Equipment window. Now drag the **nullzone** slider (found in the lower half of the window) to the desired position; the higher the percentage, the larger the "dead zone" that does not affect the aircraft's controls will be in the joystick's input.

4.6.7 Adding Special Equipment

The final tab in the Joystick & Equipment window, labeled Equipment, is used to set up special equipment for use in X-Plane. This tab is generally used on multi-computer X-Plane configurations in professional, FAA-certified simulators or to tie in various GPS navigators (such as a real Garmin 96/296/396 or a 430 GPS radio). After being connected to the computer, this equipment should be set up per the manufacturer's recommendations, then checked off on the Equipment screen to tell X-Plane that it is connected.

4.7 Configuring Keyboard Shortcuts

X-Plane has been designed to be both extremely flexible and easily usable. For this reason, most of the keys on the keyboard do something.

To see which keys are tied to which functions, first open the Joystick & Equipment dialog box by moving the mouse to the top of the screen, clicking Settings, and clicking Joystick & Equipment. There, select the Keys tab. In the Keys tab, you can look at the functions assigned to the keys of the keyboard.

There are two ways to change a key's function here. The window has each key of the keyboard represented by a rectangular button (found on the far left of the screen), and it has that button's function to the right of it. One way to program a key is to click one of the square buttons in the left-hand pane and select the function (found in the left-hand pane) that the key should control.

Functions are classified into a number of categories (operation, engines, ignition, etc.), found in the middle pane of this window. The functions themselves are found in the right pane of the window. Click on the radio button (that is, the small, circular button) beside the category you're looking for, then click the radio button next to the function itself.

Alternatively, click the **Add New Key Assignment** button found in the bottom center of the window. This will add a new gray button at the bottom of the left-hand pane, labeled **NONE**. Click this button and press the key you would like to program. Next, find the function you're looking for in the right-hand pane of the window and select it.

Note that it is not necessary to try and remember all of the keyboard shortcuts. Instead, many of them are shown in the menus when flying. For example, while in flight, move the mouse to the top of the screen and click the View menu to see each view (listed on the left) and the keyboard shortcut it's assigned to (found on the right within a set of brackets). For instance, in the view menu, the "Forward with Panel" view has a "[w]" next to it, so it can be selected with the 'w' key.

4.8 Configuring the Rendering Options

X-Plane is a very advanced simulator that has been designed for use across a broad range of computers with varying specifications. As such, X-Plane offers the ability to change numerous settings to optimize performance on your computer. For this reason, this is one of the most critical portions of this manual. The Rendering Options window allows you to match X-Plane's settings (and thus the demands the simulator puts on the computer) to you computer's capabilities.

The simulator's performance is measured in frames per second (FPS, or frame rate). This is how many times per second the X-Plane physics and rendering code (currently more than 700,000 lines of code!) can be run. Each time the computer runs through the program it advances the aircraft and recalculates the images that are seen (cloud formations, scenery, aircraft instruments, other aircraft, etc.).

Obviously, X-Plane has to be tremendously flexible to be able to run on a three year old computer and also take full advantage of the latest and greatest hardware available. There are two things that affect X-Plane's frame rate: the computer's capabilities and how much it is being asked to simulate (e.g., how much visibility is set, how many buildings, clouds, and other aircraft are being drawn, etc.). It will be much harder for the computer to compute images when flying an airplane in 30-mile visibility with 8,000 3-dimensional buildings and cloud puffs than it would be if X-Plane were set up with only two or three miles of visibility and no clouds. Thus, generally speaking, the higher the rendering options are set, the lower the performance and frame rate achieved.

The faster a computer can run X-Plane the more realistic and rewarding the simulation will be. Testing has shown that the human brain can separate individual frames at frame rates of less than about 20 FPS, causing the simulation to appear "choppy." Coincidentally, this is also about the same place that the engineering behind the simulation begins to fall apart. For this reason, X-Plane has set the minimum operating speed at this level. If a computer is not capable of delivering a frame rate of 20 FPS while rendering the level of detail set up in the Rendering Options page, X-Plane will automatically introduce fog to help the simulation to run more smoothly. The fog keeps X-Plane from having to draw the world to as great a distance, allowing the simulation to run faster.

The Rendering Options dialog box is used to configure the level of detail in the simulator. This window can be found by moving the mouse to the top of the screen, opening the Settings menu, and clicking Rendering Options.

4.8.1 Setting the Basic Rendering Options

The broadest-reaching graphics settings are located at the top of the Rendering Options dialog box, in the section of the window labeled "Resolutions." These include the texture resolution, the resolution of the window when in full-screen mode, the level of anti-aliasing, and more.

4.8.1.1 Texture Resolution

The **texture resolution** drop-down box determines the clarity and detail of the textures displayed in X-Plane. Textures are the image-maps that are draped over the terrain and aircraft to make them look realistic. If the **texture resolution** is set to low, the runway and terrain will look blurry and blocky. While this will not look very good, it will use very little video memory (VRAM), so a high frame rate will be more easily achievable. The more powerful a computer's video card is, though, the higher the texture resolution can be set in X-Plane without hurting the frame rate. The frame rate will be significantly impacted, though, if a texture resolution is selected that requires more VRAM than the computer's video card has.

You can easily determine how much VRAM is required to render the current scene. At the bottom of the Rendering Options dialog box is a line that reads "Total size of all loaded textures at current settings: *xxx.xx* meg."

In most cases, this number will only be updated after X-Plane is restarted—that is, you cannot change the texture resolution, close the Rendering Options window, and reopen it to check the amount of VRAM used.

If your system has a video card with 512 MB of memory and the VRAM currently used is only 128 MB, then a higher texture resolution can be set without problems. This will cause the scenery, runway, and airplane to all look sharper and crisper. As long as X-Plane is not requiring more VRAM than the system's video card has, the simulation's frame rate will not be impacted. Note that if a texture resolution is set which requires substantially more VRAM than the video card has, the simulator's frame rate will be massively impacted as the computer begins to use system RAM to store textures—a very slow process.

Do not worry if the total size of all textures loaded is larger than the amount of VRAM in your system; in a perfect world, the VRAM used will be about equal to or a bit more than the VRAM of the system's video card. This will give maximum texture detail without overflowing the video card's memory and reducing the frame rate. Machines with faster graphics busses (like PCIe x16) will be less sensitive to VRAM use.

4.8.1.2 Gamma

The **gamma** setting controls the overall brightness of the dark parts of the X-Plane world. Versions of Mac OS prior to 10.6 Snow Leopard used a default gamma of 1.8, whereas newer versions of OS X, as well as all versions of Windows, use a default gamma of 2.2. Increase this by a small amount (0.1 or so) if X-Plane looks too dark.

4.8.1.3 Anisotropic Filtering

Anisotropic filtering is a bit complicated.

Imagine taking a photograph and looking at it from about two feet away, with your eyes directly above the image and perpendicular to it. Things are clear and sharp, right? Now imagine taking the same picture and rotating it 90° away from you so you're looking at the edge. Obviously, the image is no longer visible. Now rotate it back towards you 5 or 10°. You can just start to make out the image, but since you're looking at it from such a low angle, the picture is fuzzy and poorly defined.

This is analogous to looking at the X-Plane scenery from a low altitude on a clear day. The images directly in front of the aircraft will be relatively clear, but the closer the scenery gets to the horizon, the fuzzier the image becomes. The anisotropic filter helps to clear this fuzziness away, making the image clearer. This option has a minimal effect on most machines and a moderate impact on some machines. Try it out and see if you like it and if you can live with the performance penalty.

4.8.1.4 Full-Screen Resolution

The box labeled **run full-screen at this resolution**, when checked, will cause X-Plane to run in full-screen mode at the resolution you choose from the drop-down box. Selecting the "Default

Monitor Settings" will make X-Plane use the same resolution as your operating system. If you choose a resolution with a different aspect ratio than your monitor has, X-Plane will appear stretched. This would happen, for instance, if your monitor had a native resolution of 1920 x 1080 (a widescreen, 16:9 aspect ratio) and you selected a resolution of 1024 x 768 (a "standard" 4:3 aspect ratio).

4.8.1.5 Frame Rate Locking

The **frame rate lock to monitor** drop-down box allows you to steady the simulator's frame rate by not allowing the frame rate to exceed a certain value. If X-Plane generally runs as a high frame rate on your computer, but does not do so smoothly and consistently, you can lock the frame rate to some ratio of your monitor's refresh rate to keep the frame rate steady.

4.8.1.6 Anti-Aliasing

The **anti-alias level** parameter is used to smooth the edges of the objects drawn in the simulator. When a computer tries to draw diagonal lines across the finite number of rectangular pixels in a monitor, "jaggies" result—pixelated-looking, stair-stepped lines. These jaggies may be (somewhat) eliminated by turning on anti-aliasing. This will cause X-Plane to actually draw the simulated world several times per frame and blend those frames together, resulting in a better looking image. Thus, it is similar to using a higher screen resolution; running at a resolution of 2048 x 2048 without anti-aliasing is similar to running at 1024 x 1024 and 4x anti-aliasing. Both situations tax the video card with virtually no increase in CPU use. This will completely kill the simulator's frame rate if the system doesn't have a strong video card, but if the video card can take it, crank this option up. Please note that in HDR rendering mode, standard anti-aliasing using this parameter is *not* recommended; it will impact frame rate without providing any real benefit—this is simply a function of the way the new deferred rendering system works. Since HDR rendering is really the way X-Plane 10 was meant to be seen (since it is the only mode where the beautifully realistic global shadows are available), the **anti-alias level** parameter should probably be left at "none." Instead, use an HDR-specific method of anti-aliasing described in the section "Special Effects" below.

4.8.1.7 Field of View

The final of the basic graphics settings is the **lateral fteld of view**, found near the bottom center of the screen in the section of the window labeled "Special Viewing Options." Older monitors with a 4:3 aspect ratio (corresponding to a resolution like 1024 x 768 or 1600 x 1200) probably want to stick to a 45° field of view. Widescreen monitors (those with an aspect ratio of, say, 16:10 or 16:9 and a resolution of, say, 1920 x 1080, 1600 x 900, and so on) may benefit from a wider field of view (60° or so).

4.8.2 Setting Up the X-Plane World

Many features of the X-Plane world are turned on or off using controls found in the portion of the window labeled "Stuff to Draw." These are discussed below.

4.8.2.1 Miscellaneous Drawing Settings

When the box on the far left labeled **draw view indicator** is checked, you will see a small orange airplane in the top of the screen when you rotate your view left or right using the Q and E keys, respectively.

X-Plane can simulate orbital and sub-orbital flight using the Space Shuttle and other spacecraft. If the box labeled **draw hi-res planet textures from orbit** is checked, X-Plane will display high-resolution images of the Earth when simulating space flights. These high-resolution images will typically be displayed at altitudes of 100,000 feet or higher. This has no effect on frame rate except when flying above that altitude.

The **runways follow terrain contours** box should always be checked. This causes runways and taxiways to follow the elevation of the terrain upon which they are drawn. In some cases, the changes in elevation of the terrain may be very abrupt, which can make airport runways overly bumpy. Unchecking this box will cause X-Plane to flatten the terrain under runways to alleviate potential problems. This option has no effect on frame rate.

When the box labeled **draw forest ftres and balloons** is checked, X-Plane will randomly generate forest fires, which can be put out after scooping up water in a water bomber such as the CL-415 Bombardier. It will also cause hot air balloonists to meander through the world when the weather is nice. This option has a negligible effect on frame rate.

Checking the box labeled **draw birds and deer in nice weather** will put randomly generated deer near the airport which may bolt across the runway and cause a collision. It will also generate very realistic-looking flocks of birds, each of which is modeled independently and has its own "mission." Colliding with the birds will cause damage to the aircraft as well as engine failures and other things, just like in reality. This setting has only a marginal effect on frame rate.

The box labeled **draw aircraft carriers and frigates** will cause X-Plane to put boats and aircraft carriers in the water near your aircraft.

The box labeled **draw Aurora Borealis** will make X-Plane show the Aurora Borealis at night when in the North.

4.8.2.2 Objects on the Ground

The **number of trees**, **number of objects**, **number of roads**, and **number of cars** determine how many of each type of ground object are drawn. In general, the **number of objects** will have the greatest effect on the simulator's performance. Each of these options are CPU-intensive; if you do not have a fast, multi-core CPU, you may want to leave them at the default.

4.8.2.3 World Detail Settings

The **world detail distance** controls how much detail to use when drawing objects and other things in the X-Plane world, as well as how far away that level of detail should be used. You should almost always use the "default" setting here, ensuring that what you see is what a scenery artist intended. Lowering this parameter may improve frame rate on slower computers, though.

The **airport detail** setting controls how much detail is used in drawing portions of the scenery at airports. It can have a significant impact on performance when flying near airports. The highest settings will ensure that you see all there is to see around an airport.

The **shadow detail** setting controls how realistic the shadows in the simulator are. "Static" shadows simply draw a flat, unchanging shadow of your aircraft on the ground below it. "Overlay" shadows vary the shadow cast by your aircraft on the ground by the position of the sun in the sky. "3-D on aircraft" shadows use X-Plane 10's new shadow rendering to allow the aircraft to cast shadows *on itself* as well as on the ground; this would be most visible with a high-wing aircraft. "Global" shadows allow all objects, trees, etc. in X-Plane to cast shadows on everything else. Global shadows, of course, are much more difficult to render; they are both CPU- and GPU-intensive. The degree to which your frame rate is affected by shadows will be a function of the number of objects you' re using; lots of objects combined with global shadows may massively impact your frame rate.

Finally, the **water reflection detail** controls how thoroughly water reflections are calculated using pixel shaders; it changes how many calculations the computer must do on each pixel in the water. This can have a significant impact on the simulator' s performance when near water.

4.8.2.4 Expert Rendering Options

Checking the **compress textures to save VRAM** box and restarting X-Plane may enable the simulator to use about twice the VRAM as before without overflowing the video card. However, doing so will cause some of the crispness and precision to be lost from textures. Try it out and see what happens.

The **3-D bump-maps** and **gritty detail textures** will make surfaces in X-Plane appear more realistic. They will have some impact on frame rate (they use both the CPU and some VRAM), but for most modern graphics cards, the benefits will certainly outweigh the small cost associated with them.

4.8.2.5 Special Effects

In X-Plane, fog is used to control the visibility. Thus, enabling the **draw volumetric fog** option creates a number of small, localized fog effects, causing the density to vary whenever X-Plane draws fog. The result is that objects and scenery fade into the distance in a much more gradual (and pleasant) way than they otherwise would. On some computers, this can have a significant effect on frame rate, but for newer machines, the benefits significantly outweigh the costs.

The checkbox labeled **draw per-pixel lighting** toggles pixel shaders. Using pixel shaders allows X-Plane to add 3-D lighting on a per-pixel basis, to incredible effect. Rather than having the simulator tell the graphics card how to light an area, the graphics card determines it in real time, creating a very realistic image. If you have an older graphics card, this can have a large effect on frame rate.

HDR rendering is the new method X-Plane 10 uses for drawing the world. It allows an unlimited number of light sources, resulting in very convincing shadows across the whole world. If you have a newer graphics card (one that supports DirectX 10 or later), you will probably love using this effect; as this option is GPU-intensive, however, if you have an older graphics card, you may want to avoid it.

With HDR rendering on, two new rendering options become available: **atmospheric scatter- ing** and **HDR anti-aliasing**. Enabling the **atmospheric scattering** option causes objects that are far away to appear more washed-out, just as they do in the real world. Once again, this shouldn' t have a great impact on frame rate on newer computers. The **HDR anti-aliasing** setting allows for more effective means of smoothing otherwise jagged lines than the older **anti-alias level** control. The "FXAA" version of HDR anti-aliasing is both high quality and computationally inexpensive, so it is recommended for almost all users. The "4xFSAA" version, on the other hand, simply has the graphics card draw the image at four-times the normal size, then scale it down. This will have a much greater impact on frame rate than FXAA.

4.8.2.6 Cloud Effects

The clouds in X-Plane can be configured in a number of ways. X-Plane' s 3-D clouds are generated from many smaller cloud sprites, or "puffs." They give the appearance of a true, volumetric cloud, which can be flown through or around. They also develop over time, just as in real life, depending on weather conditions.

The **number of cloud puffs** slider sets the number of cloud puffs. Increasing the number of puffs will have a significant impact on frame rate. Be careful with this one.

The **size of cloud puffs** sets the size of each cloud puff. The larger the size of cloud puffs, the slower X-Plane will perform, although this may not be too noticeable on modern video cards.

4.8.3 Setting the Rendering Options for Best Performance

The following procedure will allow you to optimize X-Plane's performance for your computer, regardless of the power of that computer or any limitations it may have.

Before we begin, we will need to be able to tell how fast X-Plane is running on your computer. To do this, launch X-Plane and:

1. Move your mouse to the top of the screen (causing the menu to appear) and click Settings, then Data Input & Output.
2. Check the far right box next to **frame rate** (item 0, in the upper left corner of the window). This will cause X-Plane to display the current frame rate in the upper left of the screen during flight.
3. Close the Data Input & Output window (either with one of the Xs in the corners of the window or with the Enter key on the keyboard). You should now see how fast the simulation is running, in the **freq / sec** output on the far left. This is the current frame rate, given in frames per second (fps).

Note that the frame rate will change depending on what is happening in the simulation. It is not uncommon for a computer to output 50 fps while sitting on an empty runway, but drop down to, say, 30 fps when rendering lots of buildings, other aircraft, etc.

Refer to the following to determine the significance of this number.

- 19 fps is terrible and barely adequate to run the simulator.
- 25 to 35 fps is the ideal range. Higher frame rates indicate the computer isn't rendering with as much detail as it could.
- 50 fps is very high and indicates that the system could probably draw more buildings, clouds, and other objects. Studies have shown that starting at about 50 frames per second, your subconscious mind forgets that you are looking at a simulator and begins thinking you are actually flying.

4.8.3.1 Increasing the Frame Rate

If the simulator's frame rate isn't as high you would like, you can raise it by following the instructions below. We recommend following these instructions in order, checking the frame rate after each major change until you find settings that give an acceptable frame rate.

Changing Texture Quality If your graphics card has too little VRAM for the textures X-Plane is loading (a very real possibility in Version 10), you may see a huge drop in frame rate. To correct this, try the following.

1. Move the mouse to the top of the window, making the menu bar appear, and click Settings, then click Rendering Options.
2. The **texture resolution** drop-down menu determines how much video RAM (VRAM) the computer will use. If your graphics card has plenty of VRAM, you can set it as high as you want with no loss in frame rate, but as soon as the texture resolution requires more VRAM than the graphics card has, the simulator's frame rate will plummet.
3. To determine how much VRAM is being used at the current settings, look at the very bottom of this window. The last line reads "Total size of all loaded textures at current settings: xxx.xx meg."

   While it is in some cases possible to load more textures than can be stored in VRAM without a performance hit (as not all textures will be used all the time), the size of the loaded textures should not be significantly greater than the VRAM on the system's video card.
4. Lower the texture resolution if the current settings require much more VRAM than your video card has.

After changing the texture resolution, X-Plane must be restarted for the change to take effect. We recommend putting the texture resolution on its lowest setting, exiting the sim, restarting it, and noting the frame rate. From there, raise the texture detail up one level and repeat until the frame rate decreases. This is the point at which all of the video card's RAM is being used. Back the texture resolution off to one level lower than where the decrease was noted and restart X-Plane one more time.

If, after restarting X-Plane, your frame rate is still low, you may want to disable some of the newer features of the X-Plane renderer, such as HDR rendering and global shadows.

Disable HDR Rendering, Simplify Shadows, and Lower Water Reflections The latest rendering features in X-Plane 10 (HDR rendering, global shadows, and water complex water reflection) can be very costly on older computers. HDR rendering is potentially quite GPU-intensive, and global shadows and water reflections are both CPU- and GPU-intensive. Therefore, if you are having issues with the frame rate, should be some of the first options to go.

Uncheck the **HDR rendering** option (located in the Special Effects portion of the window). Next, set the **shadow detail** (located in the Stuff to Draw portion of the window) to either "overlay" or "3-D on aircraft." Finally, set the "water reflection detail" to "none." Restart X-Plane, and you should see a dramatic rise in frame rate. If, however, the frame rate is still unacceptable, you may need to change the resolution as well.

Changing the Resolution The screen resolution refers to the number of pixels that X-Plane must fill. The lowest available (and default) resolution is 1024 x 768. Increasing the resolution will cause a drop in frame rate if your graphics card is not powerful enough.

When using X-Plane in windowed (i.e., not full-screen) mode, simply dragging the window size down will lower your resolution. When using X-Plane in full-screen mode, open the Rendering Options by moving the mouse to the top of the screen, clicking Settings, then clicking Rendering Options. Since the **run full-screen at this resolution** box must be checked for full-screen mode, you can use the drop-down menu to the right of that box to choose a lower resolution. Try 1024 x 768 first to see if lowering the resolution does indeed improve your frame rate. Note, however, that choosing a resolution different from the resolution set in your operating system may cause X-Plane to display a black border around the simulator.

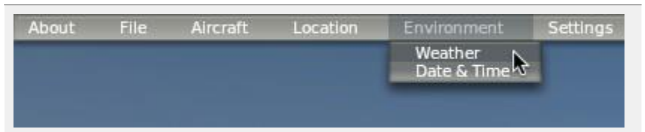

Figure 4.4: Selecting the Weather option from the Environment menu [Full size →]

Optimizing Other Rendering Options A few more rendering options are very important in getting the best performance in X-Plane on your computer. Once again, to modify the rendering options, move your mouse to the top of the screen, click Settings, and click Rendering Options.

On most computers, the rendering options with the greatest impact on performance are the **number of objects**, **number of roads**, and **number of cars**, simply because these are CPU-limited rather than being GPU-limited. These settings have a *huge* impact on frame rate. Set them to **none** for the most speed, then restart X-Plane for the changes to take effect. Check the frame rate, bring both settings up one level, and repeat, restarting the simulator each time to see how performance is affected. Setting these options to higher levels will look much nicer but will negatively impact the X-Plane's frame rate.

Another important factor for X-Plane's performance is the **world detail distance** setting. This setting determines how far away from your aircraft the simulator's 3-D objects will be rendered in high quality. Doubling the detail distance will cause X-Plane to draw *four times as many* objects. This is due to the fact that, from the aircraft's point of view, the number of objects rendered will grow in all directions equally. You may want to change this from **default** to **low** if frame rate is at issue.

Higher values in the **airport detail** field will give, among other things, nice 3-D runway lights, center line lights, and runway edge lights instead of simple, bodiless spots of light. These effects contribute to a very authentic look for airports, but since these are only visible near the ground, you may find the default value an acceptable compromise; lowering this setting can improve performance significantly.

Modifying Cloud Rendering and Visibility Another group of settings that can be modified for performance are the weather effects.

The number of "puffs" in each of X-Plane's clouds can significantly affect performance. To get a boost in frame rate, first open the Rendering Options as described above. There, drag the **number of cloud puffs** slider down, perhaps to 10%.

A further increase in frame rate can be obtained by drawing only a few simple clouds, with relatively low visibility. To set this, do the following:

1. Bring down the menu as above and click Environment, then Weather, as shown in Figure 4.4.

2. Select the radio button labeled "set weather uniformly for the whole world," located near the top of the screen.

3. Using the three cloud drop-down menus (found in the upper left of the screen, and pictured in Figure 4.5), set the cloud types to "clear" or "cumulus overcast" for max frame rate. For a good frame rate, set them to "thin cirrus" or "stratus." "Cumulus scattered" or "cumulus broken" take a lot of computing power to display.

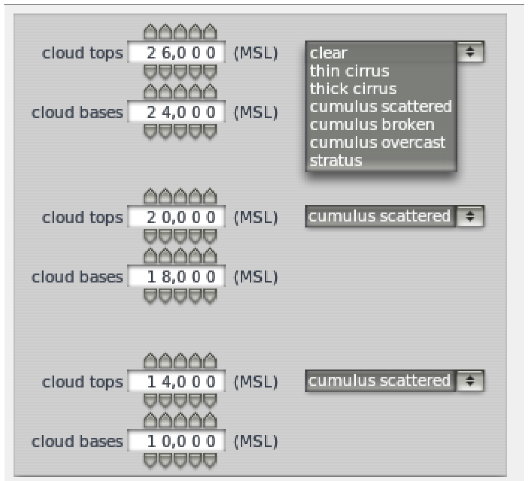

Figure 4.5: Setting the cloud coverage for the whole world [Full size →]

4. Set the visibility (found on the left side of the screen) to about five miles or so. Higher visibility takes more computing power because the computer has to calculate what the world looks like for a much larger area.

Changing the Number of Other Aircraft The final setting that really impacts the simulator's frame rate is the number of other airplanes. Access this by moving the mouse to the top of the screen, clicking Aircraft, then selecting Aircraft and Situations. In the dialog box that appears, go to the Other Aircraft tab.

There, the **number of aircraft** setting (found in the upper left of the screen) should be set to one for maximum speed. This means X-Plane will only have to calculate physics on your aircraft, providing a significant speed increase on slower CPUs.

With that done, your performance should be optimized, and you're ready to fly.

4.9 Configuring the Sound

To configure the sound, move your mouse to the top of the screen and click Settings, then Sounds. The dialog box that appears allows you to configure the relative volumes of all sounds in X-Plane using the sliders on the right side of the window. On the left side, sounds can be turned off by category. By default, all sounds are enabled, with volumes set at 100% (sliders fully to the right).

The bottom of this window will also check the status of speech synthesis software. If the software is not installed on Windows, download the Microsoft Speech SDK 5.1.

4.10 Allowing X-Plane through Your Firewall

Some features of X-Plane require that X-Plane be able to communicate across your network. These features include:

- networked multiplayer flights,

- multi-computer simulations,
- integration with EFIS App for iPad, and
- integration with X-Plane Remote.

In order for your computer to "see" the other computers in the situations above, you must first allow X-Plane to communicate through your firewall. If your computer is not running a firewall, of course, this is of no concern to you.

To allow a program through the firewall in Windows XP, follow Microsoft's instructions in Knowledge Base Article 842242.

To do this in Windows Vista and Windows 7,

1. Open Windows Firewall by clicking the Start button, clicking Control Panel, clicking Security, and then clicking Windows Firewall.
2. In the left pane, click **Allow a program through Windows Firewall**. If you are prompted for confirmation, click **Allow**.
3. (Windows 7 only:) Click **Change settings**, then click **Allow** if asked for confirmation.
4. Select the check box next to X-Plane, and then click OK.

To allow X-Plane through the firewall in Mac OS,

1. Open **System Preferences** from the **Apple** menu.
2. Click Security (called Security & Privacy in OSX Lion).
3. Click the Firewall tab.
4. Unlock the pane by clicking the lock in the lower-left corner and enter the administrator username and password.
5. Click **Advanced.** to customize the firewall configuration.
6. Click the **+** (plus) button, then select your copy of X-Plane.app. This is found in the X-Plane 9 or X-Plane 10 installation directory, which is located by default on your desktop. With X-Plane selected, click **Add**.

4.11 Expanding X-Plane

X-Plane can be modified in a number of ways. You can add aircraft or custom scenery, or you can download plug-ins that can radically alter the functionality of the simulator. If you don't find the aircraft, scenery, or plug-ins you're looking for, you can create you're own with a bit of programming know-how. The X-Plane Wiki has a wealth of information on creating both scenery and aircraft, and the X-Plane SDK site has documentation on developing plug-ins. The Plane Maker manual will prove especially useful for users creating aircraft files.

4.11.1 Adding Aircraft

Perhaps the easiest place to find new aircraft is the X-Plane.org "Download Manager" page. All the aircraft in that section of the site are free, though X-Plane.org does have models (some of which are very, very good) for sale. Other noted sources of high-quality, payware aircraft are the folks at X-Aviation, as well as Jason Chandler of AIR.C74.NET.

When downloading a custom aircraft, it will typically be in a compressed folder (usually a ZIP file) that contains the airplane and all its various paint jobs, airfoils, custom sounds, and instrument panels. Once the compressed folder is downloaded, you should be able to double-click on it to open or expand it on Macintosh, Windows, or Linux boxes.

From here, the folder can be expanded out into the Aircraft folder within X-Plane 10 directory, or the files within can be dragged and dropped into the Aircraft folder. Be sure to place the new aircraft files in a folder with the name of the aircraft—for instance, for a newly downloaded Piper J-3 Cub, the folder path in Windows might look like this:

```
C:\Documents and Settings\User\Desktop\X-Plane 10\Aircraft\Piper Cub\
```

With the new aircraft in the proper directory, open up X-Plane. Move the mouse to the top of the window (causing the menu to appear). Click Aircraft, then click Open Aircraft. Find the file there and double click on it to load.

Of course, users can also upload their own aircraft to X-Plane.org and similar sites. To do so, first create a custom airplane (using Plane Maker) with airfoils, panels, sounds, etc., per the Plane Maker manual. All the files making up the aircraft then need to be compressed into a ZIP folder to be uploaded to the Internet.

To compress a folder in Windows, right click on the file containing all the files needed for the plane, move the mouse down to Send To, then click "Compressed (zipped) Folder." A new .zip file will appear in the directory.

On the Mac, right-click or control-click (that is, press the Ctrl key on the keyboard while clicking with the mouse) on the aircraft folder in Finder. In the resulting menu, click "Compress [*file or folder name*]" to make a compressed ZIP archive of that aircraft.

These custom aircraft may be uploaded and shared (or sold) at will. We place no copyright restrictions of any sort on aircraft made by users with Plane Maker.

4.11.2 Adding Scenery

Custom scenery packages, too, can be found on the "Download Manager" page page of X-Plane.org, among other places. These may be downloaded and installed at will. Typically, custom scenery packages will need to be unzipped into the `X-Plane 10\Custom Scenery` folder. Additionally, the XAddonManager utility may be helpful for managing a large amount of custom scenery or downloaded objects.

To create new custom scenery, use the World Editor tool (WED), downloadable from the Scenery Tools page of the X-Plane Wiki. A good number of tutorials for the tools can be found in the Scenery Development section of the X-Plane Wiki.

4.11.3 Installing Plug-Ins

Plug-ins are little programs that let the user modify X-Plane. People write plug-ins to do all sorts of interesting things like hang weights on the dashboard that move around accurately, run little tugs around to push your airplane on the ground, or draw interesting terrain visualization systems, among other things. Once again, X-Plane.org (and specifically the Downloads > Utilities page) is a good place to go to find various plug-ins and other things to tweak your copy of X-Plane.

For information on creating custom plug-ins, see the X-Plane SDK site.

Chapter 5

Flight in X-Plane

X-Plane, of course, is a flight simulator. A typical flight consists of some, if not all, of the following steps:

- choosing an aircraft,
- going to a location (either an airport's runway, a location some distance out from an airport in order to make an approach to the airport, or a random location),
- setting the weather and time of day, and
- actually flying.

In addition, you might take advantage of a number of features of the simulator either before or during a flight. These include using instruments in the aircraft's panel, switching your view of the aircraft, visualizing your flight (either on a 2-D map or in 3-D), and creating files to share your flight with others.

5.1 Setting Up a Quick Flight

As of X-Plane 10.10, the first thing you see when you launch X-Plane (unless you disable it) is the Quick Flight screen, as seen in Figure 5.1. This screen combines miniature versions of the dialogs which are used to open aircraft, choose an airport, and set up the weather.

Choose an airport from which to take off by using the upper-left box in this window. You can either type the airport's name or identifier in the text box to search for it, or scroll through the full list. Click on an airport to select it.

To the right of the airport selection is a box displaying your X-Plane directory. This is used, in combination with the "cover flow"-like view in the bottom left of the window, to select an aircraft. By selecting the X-Plane 10 folder, or the Aircraft folder, you will be able to scroll through all the aircraft you have installed. Clicking on a more specific folder will expand it, and the cover flow view will show you only the aircraft in that folder. The frontmost aircraft in the cover flow is the one which is selected.

Set the time of day and weather using the rightmost boxes. Click on one of the rectangular panels to select the time of day and weather conditions shown in that panel. By checking the **always track real date and time** box will make the time in the simulator match your computer's time. Checking the **use real weather** will cause X-Plane to occasionally download the real-world weather in your aircraft's location.

Finally, when you've finished setting up the flight, press the **Fly with these options** button.

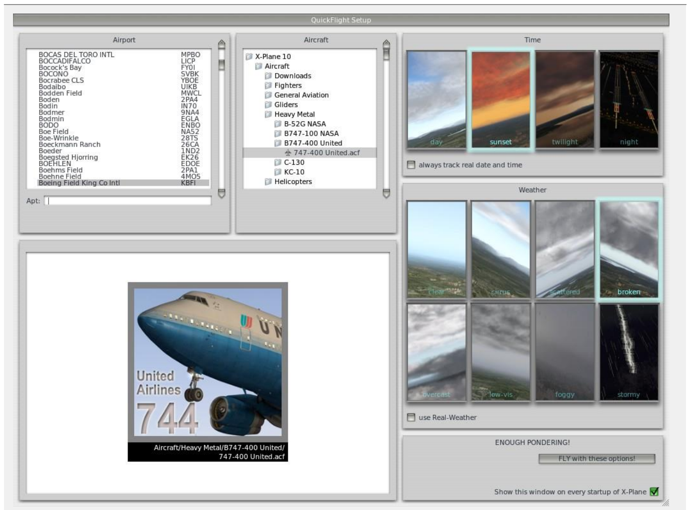

Figure 5.1: Setting up a quick flight upon launching X-Plane [Full size →]

To set up a quick flight in the future, bring down the menu by moving your mouse to the top of the screen, click File, and click Quick Flight Setup.

5.2 Opening an Aircraft and Selecting a Livery

When launching X-Plane for the first time, the default airplane will be loaded. After that, X-Plane will load the aircraft that was being used the last time you quit the program.

To open an aircraft in X-Plane:

1. Move your mouse to the top of the X-Plane window, causing the menu to appear.

2. Click Aircraft, then click Open Aircraft.

3. The Open Aircraft dialog appears, as seen in Figure 5.2. In the left half of this dialog box is a display of the X-Plane directory and its subfolders. To the right is a "cover flow"-type display of all the aircraft contained in whichever directory is selected in the left-hand pane. You can scroll through this cover flow view using your mouse's scroll wheel—whichever aircraft is foremost in that view is the one selected.

4. Select an aircraft, either by clicking its folder and the corresponding ".acf" file in the left-hand pane, or by scrolling to it in the right-hand pane.

5. With an aircraft selected, you can change its livery (i.e., its paint scheme) by clicking the bullets in the lower right pane in this window.

6. Once you've selected the aircraft and livery you'd like, click the **Open Aircraft** button.

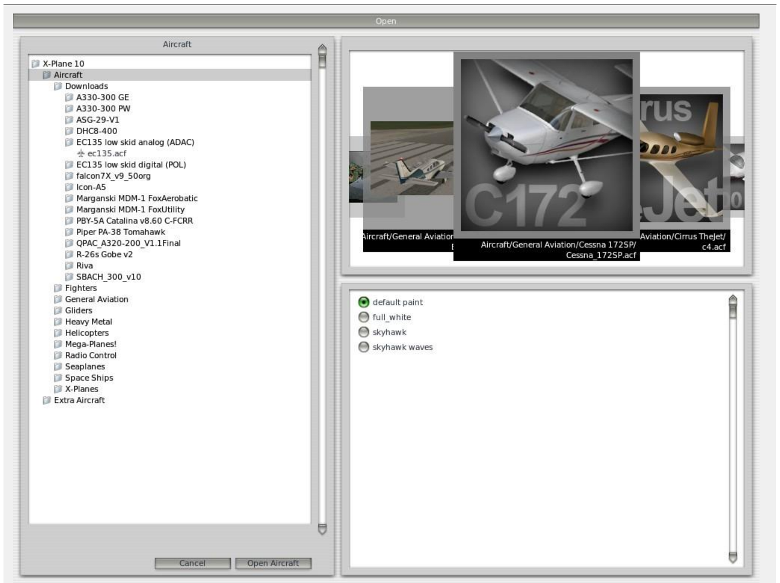

Figure 5.2: Selecting the Open Aircraft dialog from the Aircraft menu [Full size →]

5.3 Choosing an Airport or Location

X-Plane's aircraft can be relocated to virtually any airport on Earth. It can place your aircraft on a runway or apron, or it can start you in the air on a 3 or 10 nautical mile approach to a runway. To select an airport, first move your mouse to the top of the screen, causing the menu to appear. Click on the Location menu, then click Select Global Airport. In this dialog box, you can search by name or ICAO identifier through the complete X-Plane airport database. This represents nearly every airport on the planet (currently more than 32,000).

The Select Airport dialog box is divided into three parts. In the top left is a listing of every airport name, arranged by airport name, with the airport's identifier listed to the right. To the right of the list pane is an overhead view of the currently selected airport's layout. The bottom half of the window displays rows of "quick start" buttons. The buttons in the "Takeoff" column (on the far left) will transport the aircraft to the specified runway. To the right of these buttons are the "Final Approach" buttons, which will transport the aircraft to the specified distance away from the runway on the button's left. Finally, the "Ramp Start" buttons will transport the aircraft to the specified ramp for takeoff.

To search the available airports, type either the airport name or the airport ID into the white box below the list pane (labeled "Apt:"). For instance, you could obtain the same results by searching for "KLAX" or "Los Angeles Intl." You could even just type "Los Angeles" and scroll through the results.

Alternatively, use the up and down arrows on the keyboard to move through the full list. To travel to an airport, click on it once in the list pane to highlight it (causing a grey box to appear around it), then click the **Go to This Airport** button.

Note that if the aircraft is moved to an area that does not have any scenery installed, it will

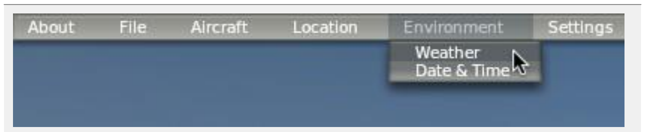

Figure 5.3: Selecting the Weather option from the Environment menu [Full size →]

end up on a runway which is hovering above the ocean down below. This is referred to as "water world" and it is covered in detail in Appendix F, Water World.

For a full explanation of the airport identifiers used in X-Plane, see the X-Plane Airport and Navigation Data site's FAQ for X-Plane Users.

5.3.1 Other Ways to Choose a Location

You do not have to choose a location for your flight using the list of world airports. You can have X-Plane choose a random location near you by moving the mouse to the top of the screen, clicking Location, and selecting Get Me Lost. You can also choose a location visually from the 3-D globe by selecting the Planet Map from the Location menu. The controls in the bottom right corner of this dialog box move your view of the globe as follows.

The large round button spins the globe up, down, left, or right, depending on where along its edge the button is clicked. The buttons below this each have two small triangles. On the left is the button to zoom out, and next to it (labeled with two larger triangles) is the one to zoom in. Below the zoom buttons is the **center on acft** button, which, when clicked, centers the map view on the aircraft.

Clicking a location on the planet map will transport the aircraft to the airport nearest where the map was clicked. To close the window without relocating the craft, click one of the Xs in the top corners or press the Enter key.

5.4 Changing the Environment

The X-Plane environment consists of weather, time of day, and date, each of which can be modified at will.

5.4.1 Setting the Weather

X-Plane's weather simulation is highly configurable and remarkably realistic. Weather in X-Plane can be set in four ways. The first, and most complicated, is to simply set the weather uniformly (and statically) for the whole world. This is the way most people set the weather in older versions of X-Plane. New in Version 10 is the ability to set randomly generated, highly plausible weather patterns based on a few parameters such as cloud coverage, intensity, and temperature. Using a similar system, you can manually "paint" weather patterns using the mouse, indicating where you want cloud systems to be. Finally, you can download the real-world weather from the Internet and have X-Plane reproduce it.

To edit the weather settings, bring down the menu by moving the mouse to the top of the screen. Click Environment, then click Weather, as in Figure 5.3.

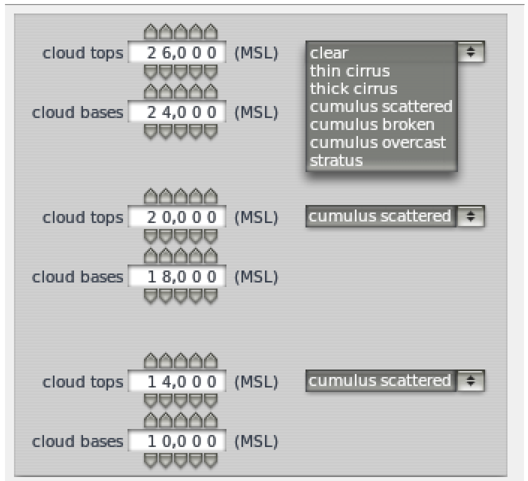

Figure 5.4: Setting the cloud coverage for the whole world [Full size →]

5.4.1.1 Setting Uniform, Static Weather for the Whole World

To set static weather for the world, first open the Weather dialog box from the Environment menu. There, select the large radio button at the top of the window labeled "set weather uniformly for the whole world." Here, there are portions of the window devoted to clouds, wind, precipitation, thermals, and water conditions.

In the upper left of the window, cloud types as well as the top and base levels for three different cloud layers can be set (as seen in Figure 5.4). These heights are measured in feet above mean sea level (MSL).

The pane below the basic cloud configuration has a number of buttons, labeled **cat-III**, **cat-II**, **cat-I**, **n-prec**, and so on. These are quick-set buttons, and pressing them will automatically set some general weather conditions.

- **Cat-III** sets the weather up for a Category-III ILS approach. These are extremely low instrument conditions, with basically zero ceiling and visibility.
- **Cat-II** sets the weather up for a Category-II ILS approach, with terribly poor ceiling and visibility.
- **Cat-I** sets the weather up for a Category-I ILS approach, with poor ceiling and visibility.
- **N-prec** sets the weather for a non-precision approach, with a 3 mile visibility and a 400 foot ceiling.
- **MVFR** sets the weather marginal VFR flying conditions, with about four miles of visibility and a 1,500 foot ceiling.
- **VFR** sets the weather to good visual flight rule conditions—clear, sunny skies.
- **CAVOK** sets the weather to clear and visibility OK. Typically pilots refer to this as "CAVU" — Clear And Visibility Unlimited.

Below the quick-set buttons is a set of sliders. Click these and drag them to change their setting. The **visibility** slider adjusts what its name suggests, measured in statute miles.

The **precipitation** slider sets the level of precipitation. Depending on the temperature around the airplane and in the clouds where it is formed, this will be in the form of rain, hail, or snow.

The **thunderstorms** slider adjusts the tendency for convective activity. The weather radar map in the lower-right of the window shows where the cells are forming. Flying into these cells results in heavy precipitation and extreme turbulence. The turbulence is great enough that in reality, airplanes can fly into thunderstorms in one piece and come out in many smaller pieces.

Taking helicopters into these icing and thunderstorm situations is interesting because their very high wing-loading on their rotor and the fact that the rotor is free teetering causes them to have a pretty smooth ride in turbulence. They are still not indestructible, though, and they are subject to icing on their blades just like an airplane.

The **turblnc** (turbulence) slider automatically sets all the sliders in the center of the screen that control the wind and turbulence. Drag this slider down to the left and hold it there for a few seconds to set all of the wind and turbulence to zero for a smooth flight.

Next, in the bottom left corner of the window, the temperature at the nearest airport and the barometric pressure (air pressure) at sea level can be set. Keep in mind that the "standard atmosphere" is 59° F (15° C) and 29.92 inches mercury (1013 millibars).

The middle column of this window controls three wind layers. Each layer has an altitude, wind speed, shear speed, shear direction, and turbulence associated with it. X-Plane will use the high, middle, and low altitude settings to interpolate between the layers. The circles to the right of each altitude setting change the direction from which the wind is coming. Click and drag near the edge of the circle and the wind will come from the direction that you let go of the mouse button (for instance, for wind moving from the south to the north, click the very bottom of the circle and release the mouse button there).

Enter the **thermal tops**, **thermal coverage**, and **thermal climb rate** in the upper right of this window. These controls are mainly used when flying gliders. In addition to thermals, X-Plane also runs air up and down the terrain as wind blows into mountains, simulating the effects that real glider pilots have to keep in mind and try to take advantage of. Try setting the wind at 30 knots or better at a right angle to a mountain range and running along the upwind side of the mountain range in a glider—you should be able to stay aloft on the climbing air if you stay pretty low. Drift to the downwind side of the mountain, though, and an unstoppable descent is assured!

The **runway conditions** drop-down box is found on the right side of the window, directly beneath the thermals controls. Conditions can be set to **clean and dry**, **damp**, or **wet**, and wet and damp conditions can be either patchy or uniform. At low enough temperatures, as in real life, a wet runway will become an icy one. This control is automatically modified when increasing the amount of precipitation.

Beneath the **runway conditions** is the wave height and wave direction for bodies of water. Changing the wave height, in feet, will also modify the wave length and speed.

Finally, beneath the runway conditions is a visual representation of the weather X-Plane generated based on your parameters. Clicking the **Regenerate weather now** button will cause X-Plane to generate a new weather system with those same parameters.

5.4.1.2 Setting Randomly-Generated, Realistic Weather

By far the simplest way of generating weather is to use weather that you exercise only a small degree of control over. In this case, X-Plane creates a weather system with some amount of uncertainty in it, allowing you some control over the features of the weather system without bogging you down in the details.

To use this randomly generated weather, first open the Weather dialog box from the Environment menu. There, select the large radio button at the top of the window labeled **set random and only semi-controlled weather patterns**.

In the left side of the window now are five sliders. These are as follows:

- **Coverage**, which controls the amount of cloud coverage in the weather system. With the slider all the way to the left, there will be no clouds at all; with it all the way to the right, there will be full cloud coverage.
- **Intensity**, which controls the degree of storminess to the weather system. With the slider all the way to the left, there will be no storms, whereas with it all the way to the right, there will be a great deal of storms.
- **Temperature**, which controls the probability of encountering icing or thunderstorms. With the slider all the way to the left, the weather will be very cold, with a high probability of icing. With it all the way to the right, the weather will be hot, with a higher probability of encountering thunderstorms.
- **System size**, which sets the size of the weather systems in the area. With this all the way to the left, there will be many small systems. With it all the way to the right, there will be only a few large systems.
- **Randomness**, which controls how closely the weather matches the parameters you set. With this all the way to the left, it will match very closely to what you specified. With it all the way to the right, the incidence of random changes is greatly increased.

After setting the sliders as you want them, click the **Regenerate weather now** button to have X-Plane create a weather system with those characteristics. Close the Weather window and you' ll be ready to fly.

5.4.1.3 Drawing or Adding to Weather Patterns by Hand

You can add to an existing weather pattern, or create a completely new one, using your mouse to specify the location and intensity of clouds.

To do this, open the Weather window from the Environment menu and select the large radio button in the top of the window labeled **paint weather patterns by dragging the mouse**.

Here, the largest pane in the window represents the airspace around your aircraft. You can click and drag anywhere in this box to have X-Plane randomly generate clouds there. Drawing clouds twice in the same area will increase the intensity of the clouds there. Finally, at any time, you can click the **Clear weather** button to clear all weather features in your area.

When you' ve finished drawing the weather patterns, close the Weather window and you' ll be ready to fly.

5.4.1.4 Downloading Current Real-World Weather from the Internet

The final method of setting the weather in X-Plane is to download the weather from the Internet. To enable this, first open the Weather dialog box from the Environment menu. There, select the large radio button at the top of the window labeled **grab real weather from the net**. Check the box labeled **Download Real Weather ftle 'METAR.RWX' from the net**. X-Plane will automatically download the weather in your current location, and it will set a timer to re-download weather in one hour. If you want to download weather at some other time, you can always come back to this window and press the **Download right now** button.

5.4.2 Setting the Date and Time

The date and time in X-Plane can be set by first moving the mouse to the top of the screen (causing the menu to appear), clicking Environment, then clicking Date & Time. Dragging the top slider changes the time, given as both local and Zulu time (that is, Greenwich Mean Time or UTC). Changing the date, the second slider, will accurately track changes in the length of days and nights within X-Plane. For instance, there are fewer daylight hours in December than in June in North America, as in the real world.

If the local time offset from GMT in your location is not what X-Plane expects, you can modify it using the **correction from GMT**, measured in hours.

Finally, you can check the **always track real date and time** box to keep X-Plane in sync with the date and time set in your operating system.

5.5 How to Fly

When flying for the first time (both in X-Plane and the real world), it's a good idea to use a relatively simple aircraft. The Cessna 172 is an excellent choice in this regard, a fact attested to by the millions of real-world pilots trained in this model. For instructions on opening an aircraft, see the section "Opening an Aircraft and Selecting a Livery" of this chapter.

Before beginning, be sure you have configured your flight controls, if applicable, per the section "Configuring Flight Controls" of Chapter 4. If you are not using flight controls, you will have to fly with the mouse. In this case, there will be a small white plus sign (+) in the center of the screen. If only this cross is visible, with no white box around it, X-Plane is indicating that the pilot's "hand" is not on the stick. This means that the mouse is free to move anywhere without impacting the flight controls. To grab the stick (and thus take control of the aircraft), click the left mouse button in the vicinity of the little white cross and a white box will appear around the cross. The mouse button should not be held down, only clicked once to turn the box on (i.e., to grab the stick) and again to turn the box off (to release the stick). When the box is visible, the pilot's hand is on the stick and any movements of the mouse within the box will position the flight controls accordingly. Thus, moving the mouse directly below the cross will command some up elevator (causing the plane to climb) and not will not impose any roll commands (which should keep the aircraft from changing its bank). Likewise, keeping the mouse lined up exactly with the cross but deflecting it to the right a bit will cause the plane to bank to the right without altering its pitch.

To take off, the airplane must first be located at the end of a runway. X-Plane relocates the craft here whenever the program opens, an aircraft is loaded, or the location is changed. To take off in the Cessna 172, slowly advance the throttle, then release the brakes (for instance, by using the 'b' key) when the throttle reaches its halfway point. Continue to advance the throttle and be ready to feed in some right yaw (using the right rudder or the twist on the joystick, if applicable) as the airplane accelerates. The tendency to turn to the left is normal in single engine aircraft due to the turn of the propeller.

Don't worry if it takes a few tries to learn how to keep the aircraft on the runway—a Cessna can take off in the grass just fine. If the airplane turns off the runway as it's accelerating, just keep on going. Normally, the pilot will rotate (that is, apply some up elevator by pulling back on the yoke or stick) at about 60 knots in the Cessna 172. Once the aircraft leaves the ground, push the stick forward a bit to momentarily level off and allow the airplane to build speed. Once the craft reaches 80 knots or so, pull back gently on the stick again and resume climbing. Building airspeed before climbing this way will help keep the plane from stalling.

Note that if a crash occurs that damages the airplane too badly, X-Plane will automatically open a new airplane and place it at the end of the nearest runway (which in some cases may be a grass strip). If the impact is only hard enough to damage the airplane without necessarily destroying it, the aircraft will just sit there and smoke. If this happens, you will need to move your mouse to the top of the screen, click Aircraft, then click Open Aircraft to get things fixed. If only it were so easy in the real world!

5.6 Using the Instruments and Avionics

When using the forward cockpit view, the mouse can be used to control the instruments in the panel, just as the pilot's hand would be used to manipulate the instruments, switches, and other controls.

To operate a button, just click it and release. To operate a switch, do the same to change its position. For example, to bring the landing gear down (on planes that are able to), click with the landing gear switch. Of course, this control will look different in different aircraft. Keep in mind that the 'g' key could also be used or a joystick button could be assigned to toggle the gear.

To turn knobs, move the mouse to the "plus" or "minus" side, whichever is necessary, and click to move the knob. Click repeatedly for greater movements.

To easily see the controls within the cockpit that the mouse can operate, open the Instructions dialog box from the About menu and check the box labeled **Show mouse click regions in the cockpit**. This will draw a thin yellow square around the areas of the instrument panel that can be manipulated with the mouse.

If you have trouble interacting with (or even seeing) a control, you can switch to the 3-D cockpit mode by pressing Shift+9, then move your view backward by pressing the comma key (','). This will allow you to see the whole of the cockpit, provided the aircraft you are using has a 3-D cockpit. Alternatively, you can use the up, down, left, and right arrow keys to move your view around in the 2-D panel view.

To get a quick description of the instruments in the panel, open the Instructions dialog box from the About menu and check the box labeled **Show instrument instructions in the cockpit**. After closing the window, you'll see a description of an instrument whenever you hold the mouse over it.

5.6.1 A Note on Radio Tuning

Avionics in most airplanes utilize twin concentric knobs that allow the pilot to tune the radio. For example, there will typically be a large knob on the surface of the radio, with a smaller knob sticking out from the large one. The large knob controls the integer ("counting number") portion of the frequency and the smaller knob controls the decimal portion.

For example, imagine that the COM1 radio (the communications radio number 1) needed to be tuned to 128.00 MHz. In a real aircraft, the pilot would turn the big, lower knob until 128 was visible in the window, then turn the small, upper knob until 00 was visible.

X-Plane is set up the same way. When hovering the mouse in the vicinity of one of the radio tuning knobs, two counter-clockwise arrows will appear on the left of the knob and two clockwise arrows on the right. The arrows closest to the knob are physically smaller than those on the outside- these adjust the decimal portion of the frequency. The outside arrows are larger and adjust the integer portion of the frequency.

Movement Name	**Keyboard Shortcut**	**Effect**
Translate left, right, up, and down	Corresponding arrow key	Shifts the view a bit in the direction you choose
Translate fore and aft	',' (aft) and '.' (fore)	Shifts the view toward the front and rear of the aircraft, respectively
Rotate left, right, up, and down	q (left), e (right), r (up), and f (down)	Spins the view in the corresponding direction
Zoom in and out	'=' (zoom in) and '-' (zoom out)	Simple zooming

Table 5.1: Controls for the 3-D cockpit view

5.7 Using the Views

You can change your view of the aircraft using the View menu, or by using the keyboard shortcuts listed in the View menu. Note that the characters in brackets to the right side of each menu option are the keyboard shortcuts for each view. For example, to select the forward view, one would press the W key, and to turn the view 45° left, one would press the Q key.

Using the menus or the appropriate keyboard shortcuts, you can *select a view* or *modify your current view*. The controls for view selection affect the *type* of view that you are using. For instance, you may choose to be in the cockpit, looking forward at the instrument panel, or you may select an external view, perhaps where you look at your aircraft from the point of view of the nearest air traffic control tower. View selection controls are described in Table 5.2.

After selecting some view, you can modify the view using translation (moving left, right, fore, or aft), rotation (spinning about your point of focus), or zoom (changing the angle of view). The default keyboard shortcuts for these effects are listed in Table 5.1.

In previous versions of X-Plane, *zooming* was used in place of the much more appropriate *translation* view modification effect (unlike translation, zooming changes the field of view significantly). Hence, in the 3-D cockpit mode, if you want to move your view closer to the instrument panel, you would press the '.' (period) key, *not* the '=' key. To move your view farther from the instrument panel, you would press ',' (comma), *not* the '-' key. Furthermore, you cannot zoom out past your camera's actual location; you have to translate backward (using the ',' key) to move farther away. You can enable 3-D cockpit mode by opening the View menu and clicking "3-D Cockpit Com- mand Look," or by pressing Shift + 9 on the keyboard. In this mode, you can move your view around the cockpit in one of a few ways:

- by clicking the right mouse button and and dragging your mouse around the screen,
- by using the keyboard shortcuts listed in Table 5.2,
- by selecting different views from the View menu, or
- by pressing a button on your flight controls which you previously configured to modify the view.

This mode leaves the mouse free to click on things in the cockpit without affecting where you are looking.

In 3-D cockpit mode, you can use the keyboard shortcuts or the View menu itself to change where you are looking. These are described in Table 5.1.

5.7.1 Using the Quick Look Feature

"Quick Look" is a new feature in the X-Plane 10.10 update. Quick Look allows you to set up a view just the way you like it, and then save it as a hot key or command. Then, in the future, whenever you press that key on the keyboard (or button on your joystick, as the case may be), you can go right back to that view again.

For example, suppose you're flying the default King Air and you find yourself frequently positioning your view in the cockpit by tilting down and zooming in on the throttle quadrant to see how you have the aircraft configured. This can take some time to set up and if you do it often, it can get tedious.

The solution, then, is to set up a Quick Look. Set the view to however you like it, and assign it to Quick Look 1 by pressing Ctrl+Num Pad 1 (i.e., the control key, with the 1 key on the number pad). Note that the Num Lock must be on in order to do this. Now, no matter how your view changes, when you press the shortcut for Quick Look 1 (by default, Num Pad 1), your head position, orientation and zoom goes right back to your memorized view of the throttle quadrant.

By default, the numbers 0 through 9 on your keyboard's numeric keypad (a.k.a. the num pad or tenkey) are used to bring you back to Quick Looks 0 through 9. When pressing the Ctrl key along with any of those numbers, you will store your current view to be recalled later by that number key. Thus, to set a view for Quick Look 3, you would get the view to the way you like it, then press Ctrl + Num Pad 3, and to go back to that view, you would press Num Pad 3. However, like most keys in X-Plane, you can modify these settings if you like.

Quick Looks are not just for 3-D cockpit mode, either. They work in all aircraft-relative views, such as 3-D Cockpit, Ridealong, Chase, Circle, and Forward with HUD.

Note that the Quick Looks are *aircraft-specific* preferences. This means that your Quick Look views in the Cessna 172 do not interfere with your views in the King Air, and so on.

5.8 Letting X-Plane Fly Your Aircraft

X-Plane has the capability to fly an aircraft using artificial intelligence (AI). The AI system can both take the aircraft off and fly it around.

To enable the AI's control of the craft, move the mouse up to the top of the screen to bring down the menu bar. Click Aircraft, then select A.I. Flies Your Aircraft.

With the AI controlling the airplane, you are free to experiment with the different views and also to practice raising and lowering the aircraft's landing gear, flaps, and so on. Furthermore, this is an excellent way to practice tuning radios.

In addition, you can have the AI control your view by opening the Aircraft menu and selecting A.I. Controls Your Views.

5.9 Getting Quick Instructions

If you need simple, sparse instructions on performing common tasks in X-Plane, you can move your mouse to the top of the screen, click the About menu, and click Instructions. Here, the tabs labeled "Flight Controls," "Cockpit Control," "Keyboard," "ATC," and "Tech Support" describe these common questions relating to the X-Plane simulator.

Inside the Cockpit		
Name of View	**Keyboard Shortcut**	**Effect**
Forward with panel	w	Shows the instrument panel as though you were in the cockpit, facing forward
Forward with HUD	Shift+w (i.e., ‘W’)	Shows a front-facing view with no instrument panel, only a head-up display (HUD)
Forward with nothing	Ctrl+w	Shows a front-facing view unencumbered by an instrument panel or any other display
3-D cockpit, using key commands to look around	Shift+9 (i.e., ‘(’)	Displays the in-cockpit view of the 3-D instrument panel, where available. Uses translation and rotation commands (listed in Table 5.1) to move and look around.
3-D cockpit, using the mouse to look around	Shift+0 (i.e., ‘)’)	Displays the in-cockpit view of the 3-D instrument panel, where available. Uses translation commands (listed in Table 5.1) to move around and the mouse to look around.
Outside the aircraft		
Name of View	**Keyboard Shortcut**	**Effect**
Moving spot	Shift+1 (i.e., ‘!’)	Moves the camera with your craft’s initial velocity.
Hold at location	Shift+2 (i.e., ‘@’)	Fixes the camera’s location some distance in front of your craft’s initial position.
On the runway	Shift+3 (i.e., ‘#’)	Fixes the camera’s location on the ground at the nearest runway.
Circling the aircraft	Shift+4 (i.e., ‘$’)	Moves the camera with the aircraft, allowing you to use the rotation and translation keys (see Table 5.1) to circle the craft.
Tower view	Shift+5 (i.e., ‘%’)	Fixes the camera at the nearest ATC tower.
Ride-along	Shift+6 (i.e., ‘^’)	“Mounts” a camera to the aircraft, which can then be moved using the rotation and translation keys (see Table 5.1).
Track fired weapon	Shift+7 (i.e., ‘&’)	Causes the camera to follow any fired weapon.
Chase	Shift+8 (i.e., ‘*’)	Sets the camera directly behind the aircraft.

Table 5.2: Controls for view selection

Checking the **Show mouse click regions in the cockpit** box will display a yellow box around the controls in the cockpit which can be manipulated with the mouse. Checking the **Show instrument instructions in the cockpit** box will display a short description of an instrument when you hold the mouse over it.

5.10 Saving and Sharing Your Flight

X-Plane offers a number of ways to save and share a particular flight. These are:

- Situations, which note the current location, environmental conditions, and properties of the aircraft in use.
- Replays, which store a "recording" of your entire flight since the last load. These are only replayable in X-Plane, but they have the advantage of being made up of X-Plane data points storing your aircraft's location, so you can change your views during the replay.
- Movie files, which begin and end when you toggle them and record exactly what you see on the screen. These have the advantage of being playable in Quicktime and other video players.
- Screenshots, which store an image of a single moment in your flight and are viewable on any computer.

In each case, you can save the flight and replay it yourself, or you can upload it to the Internet for others to see.

5.10.1 Creating a Reusable Situation

A "situation" in X-Plane is a file readable only by X-Plane. It is essentially a "snapshot" that makes a note of the aircraft you are using, its position in the air or on the ground, its payload, the amount of fuel in its tanks, and so on. It also includes information on the environmental conditions of the flight, including cloud conditions, temperature, and time of day. Furthermore, any other aircraft you have loaded will also be noted.

To create a situation (a .sit file), move the mouse to the top of the screen, click File, then click Save Situation.

By default, X-Plane saves your situation file to the following directory:

```
X-Plane 10/Output/situations/
```

This is especially useful for quickly loading and practicing a specific type of approach, or for recreating a specific combat situation. The situations can even be sent to other X-Plane users; all they need is the .sit file that you created.

To load a situation in order to fly it again, open the File menu and click Load Situation. Navigate to the location of your .sit file and double click on it to load the situation.

5.10.2 Creating an Replay

A "replay" in X-Plane is essentially a "movie" of your flight which notes the aircraft's location and attitude at each time step, beginning at the last time you loaded an aircraft or traveled to an airport and ending at the moment you click the "Save Replay" button. This file is only viewable in X-Plane, but because it is so complete, you can change your view as much as you like while replaying. This is in contrast to a Quicktime movie, which records only what you see while you're recording.

These files, like situations, can be shared with and replayed by any X-Plane user.

To create a replay (a .smo file), move your mouse to the top of the screen, click File, and click Save Replay. By default, X-Plane will store your replay in the following directory:

```
X-Plane 10/Output/replays/
```

To load a replay, open the File menu as before, but select Load Replay. Navigate to the location in which you saved your .smo file and double click on it to load.

5.10.3 Creating a Movie

In addition to file types readable only by X-Plane, you can also create more universally readable movies. The downside to these Quicktime movie (.mov) files is that they record exactly what you see when you record them. You will toggle the recording on, fly around a bit, then toggle the recording off; the resulting .mov file will contain what you saw on your screen while flying around.

To record these movies, you need Quicktime 6 or later installed on your computer. After recording the movie, you can edit it in a program like iMovie (installed on new Macs by default) or Windows Live Movie Maker.

Before recording your movie, you may want to set up the Quicktime movie's specifications. Do so by moving the mouse to the top of the screen, clicking on the File menu, then clicking Quicktime Movie Specs. In the dialog box that appears, you can set:

- the frame rate of the movie (measured in frames per second)
- the resolution of the movie (width only; height will be calculated automatically from the width), and
- the time multiplier, indicating how many frames to skip when doing a time lapse video.

In choosing a frame rate, know that videos produced at 15 frames per second will look jittery. Film and television use 24 and 30 frames per second, respectively. In choosing a resolution, keep in mind that an x-resolution of 720 pixels is 720p, and that increasing beyond the resolution you're using on your screen will give no benefit.

To begin recording a movie, either press Ctrl + Spacebar or open the File menu and click Toggle Movie. After flying whatever you intended to record, turn the recording off by either pressing Ctrl + Spacebar or clicking Toggle Movie from the File menu. A file called "X-Plane [*aircraft name*] [*number*].mov" will appear in your top-level X-Plane directory, found by default on the Desktop.

Your Quicktime file can be played back on virtually any computer. If Quicktime is not installed on the computer you want to play the file on, you can get it from the Quicktime Download page on Apple's web site.

5.10.4 Capturing a Screenshot

The final method of saving or sharing your flight is to take a simple screenshot. This can be done either by pressing Shift + Spacebar, or by moving your mouse to the top of the screen, clicking the File menu, and clicking Take Screenshot. The captured image (a .png picture file) will appear in your top-level X-Plane directory, located by default on your Desktop.

These .png screenshots can be opened and viewed on any modern computer, regardless of whether X-Plane is installed.

5.11 Visualizing and Replaying Your Flight

In addition to being able to save replays for later playback (as described in the section Saving and Sharing Your Flight above), you can visualize your flight up to your present location in a few different ways. You can view your flight path on X-Plane's 2-dimensional maps, or you can toggle the 3-D flight path and view that path in the main simulator. If you want to replay your flight, beginning at the last time you loaded an aircraft or location, you can use X-Plane's built-in replay function, which has shuttle controls to play, rewind, and fast forward, just like you would expect. Finally, if you want to visualize the path taken by a real-world aircraft, you can format its flight data recorder information in a way that X-Plane can interpret. X-Plane will treat the data in the FDR file just like a regular replay, so you can play, fast forward, and rewind as usual.

5.11.1 Viewing the Path Taken by Your Aircraft

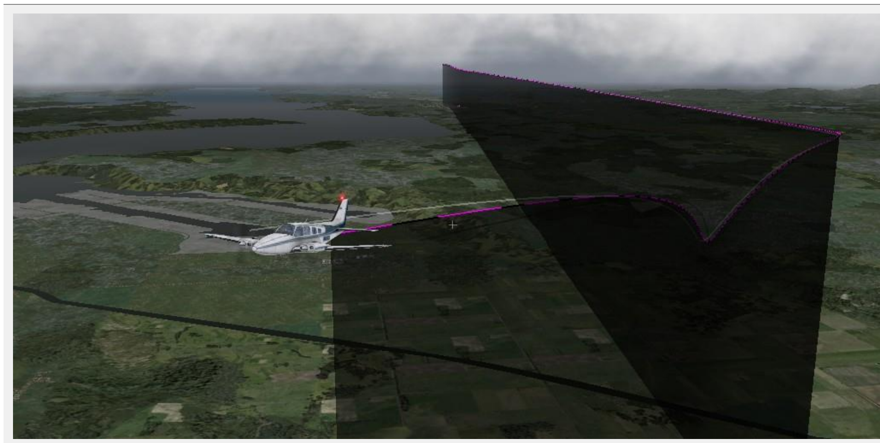

Figure 5.5: Visualizing a 3-D path [Full size →]

The path taken by an aircraft up to its current location can always be seen as a trail behind the aircraft when you toggle the 3-D flight path on. To do so, either press Ctrl + P on the keyboard, or move the mouse to the top of the screen, click on the Aircraft menu, and click Cycle 3-D Flight Path. Doing so once will cause X-Plane to display a violet-striped line behind the aircraft. Cycling the flight path again will put that line into perspective by drawing lines intermittently from the flight path to the ground. Cycling it once more will give a semi-transparent black bar extending from the flight path to the ground (seen in Figure 5.5). Cycling the path once more will turn off the flight path lines.

To reset the 3-D flight path, either press Alt + P on the keyboard, or open the Aircraft menu and click Reset 3-D Flight Path. The flight path will also be reset whenever you load an aircraft or a location.

A similar effect can be had in 2 dimensions, from an overhead perspective, by opening the Local Map dialog box. The aircraft's flight path since the last reset will be shown on each of the map views. For more information on using the navigation maps here, see the section "Using X-Plane's Navigation Maps" of Chapter 7.

5.11.2 Using the Built-In Replay

You can replay your flight, from the last time you loaded an aircraft or a location up to your current location, by toggling the replay mode on. This can be done either by pressing Ctrl + 'r' or by opening the Aircraft menu and clicking Toggle Replay Mode. In the top of the window, you will see shuttle controls to (listed left to right):

- stop playback,
- play backward faster than real-time,
- play backward at real-time speed,
- play backward slower than real-time,
- pause playback,
- play forward slower than real-time,
- play forward at real-time speed,
- play forward faster than real-time, and
- stop playback.

Additionally, you can click the shuttle slider and drag it to quickly jump around in the playback.
To return to the flight, either press Alt + ';' or open the Aircraft menu and click Toggle Replay Mode once again.

5.11.3 Replaying a Flight from a Flight Data Recorder (FDR)

The final method of visualizing a flight is to load a information from a flight data recorder (FDR). This is useful primarily in accident investigation and re-creation. In that case, you would need to take the data from the "black box" of the aircraft you're interested in and put it in a format that X-Plane can read. That format is the Flight Data Recorder (or .fdr) format. This is plain text file formatted in a particular way, which means that you can make your own FDR files relatively easily from the data you have and then re-create the flight in X-Plane.

The FDR file specification can be found in X-Plane by moving the mouse to the top of the screen, click on the File menu, and clicking Load Flight Data Recorder File. The lower half of this dialog box lists both the preceding data values (file version, aircraft, tail number, and so on) that are required, as well as each of the 100 or so data values that each instant in the flight data can have. These include the time stamp of that instant, the aircraft's location (in latitude, longitude, and altitude), the indicated airspeed, and more.

You can use the scroll bar above the file specification box to look through all the data values, and you can mouse over individual values to get a description of them. Note that even if your instantaneous "snapshots" of the aircraft do not use a given parameter (such as the engine pressure ratio, perhaps), your data file must use a dummy value as a placeholder.

After formatting your data for X-Plane as an FDR file, you can load it using the Load Flight Data Recorder File dialog box. Click the silver square labeled "Flight Data Recorder file," navigate to your file, and double click on. Then, when you close the dialog box, you will be greeted with the standard replay shuttle buttons with which you can replay the flight.

5.12 Viewing the Behind-the-Scenes Flight Model

X-Plane models flight by breaking an aircraft down into a number of little pieces and finding the forces acting on each piece. By clicking the Show Flight Model option from the Special menu (or

Figure 5.6: Illustrating the forces acting on a Baron 58 [Full size →]

by pressing Ctrl + M on the keyboard) and moving to an outside view (e.g., by pressing Shift + 8 on the keyboard for the chase view), you can actually see all the forces calculated on each piece of the craft. With some wind and turbulence turned on in the Weather screen, you can even see the pseudo-random velocity vector flow field around the airplane. The velocity vectors seen are the actual vectors interacting with the aircraft, and the force vectors (the green lines coming off the plane) are the actual forces acting on the plane—nothing is just for show here. This is the actual work that X-Plane is doing.

The green bars extending from the control surfaces of the aircraft indicate how much lift each section of the surface is generating; longer bars represent greater force. The red bars, likewise, represent drag, and the yellow bars represent lift from vertical control surfaces.

Chapter 6

Advanced Simulation in X-Plane

X-Plane is the most comprehensive and powerful flight simulator available. As such, there are a great number of features available that go beyond simply taking off, flying around, and landing. These include tools like the logbook and checklists, and features like equipment failures and damage modeling.

6.1 Keeping a Logbook

Each time an aircraft is flown in X-Plane, the program logs the flight time in a digital logbook. By default, X-Plane creates a text file called "X-Plane Pilot.txt" in the `X-Plane 10/Output/logbooks` directory. Inside this text file are the following details of previous flights:

- Dates of flights
- Tail numbers of aircraft
- Aircraft types
- Airports of departure and arrival
- Number of landings
- Duration of flights
- Time spent flying cross-country, in IFR conditions, and at night
- Total time of all flights

To see your logbook, open the About menu and click Logbook. You can load a logbook by clicking the **Choose Pilot Logbook** button and navigating to your logbook, or you can create a new logbook using the **New Pilot Logbook** button.

6.2 Working with the Air Traffic Control

X-Plane 10's air traffic control (ATC) system is powerful and realistic when you want to practice real-world protocols, but completely unobtrusive when you want to just fly. Although AI aircraft (i.e., those that you have turned on using the Aircraft & Situations dialog box) will *always* follow the guidance of the air traffic control, they will also work around your aircraft if you are not interacting with the ATC.

Note: You will only be able to hear the air traffic control chatter if ATC audio output is enabled; to confirm this is the case, open the Settings menu, then click Sound.

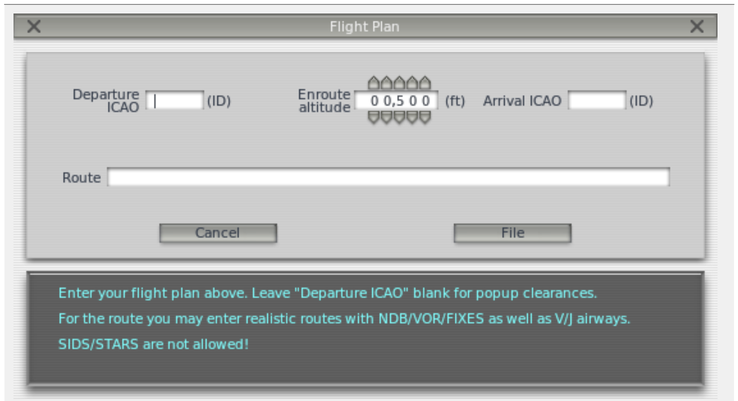

Figure 6.1: The Flight Plan dialog box [Full size →]

All interactions with the air traffic control occur via the on-screen ATC menu. To access this menu, simply press Enter (Return) on the keyboard. Alternatively, you can use the Joystick & Equipment dialog box to program your joystick to access this menu.

In order to make a request or hear from the air traffic controllers, you must have your COM 1 radio tuned to the proper frequency for the request. Filing a flight plan is independent of any controller, so that option is always available. However, once the flight plan is filed, you must tune to the Clearance Delivery, Ground, or Tower frequencies (if available, in that order as in the real world) to get clearance for takeoff. After you get clearance, you tune to the Ground (if available) or Tower frequencies for your taxi clearance. When you get to a hold short line, ground control will hand you off to tower and then you'll receive handoffs throughout the rest of your flight when necessary; keep tuning to the proper frequency to continue to receive air traffic control guidance. Note that the Local Map dialog box (opened from the Location menu) will display the relevant frequencies for any airport that you mouse over.

As in the real world, any ATC interaction begins with filing a flight plan. Thus, the first time you press Enter during a flight, the only option available will be "File Flight Plan." Click that line of text to display the Flight Plan dialog box (shown in Figure 6.1).

You must enter your departure and arrival points, in the same ID format as the points appear in the X-Plane maps, as well as your planned cruising (enroute) altitude. Pressing the File button will register your flight plan with the X-Plane air traffic control.

With your flight plan filed, you can bring up the ATC menu again by pressing Enter, then click "Request Clearance."

The following is a brief walkthrough on how to depart the KSEA area:

1. Use the Open Aircraft dialog to load a small aircraft, such as the Cessna 172, as this will be a quick flight. Use the Select Global Airport dialog box to position yourself at a gate at KSEA.

2. Press Enter on the keyboard to bring up the ATC menu, then select "File Flight Plan."

3. Enter KSEA as the departure ICAO, set your altitude to 3,000 feet, and then set your destination to KBFI. We're going to leave the route blank because we want to go *direct*, but you could also enter any NDB/VOR/FIX/Airway to get real routings. When you're done click **File**.

4. You now have a flight plan in the system. If you wish to change your mind, you can return to the flight plan dialog in the same way and update it.
5. You need an IFR clearance before you can proceed, so tune your COM1 radio to 128.00, the clearance delivery frequency at KSEA. Now bring up the ATC menu and you'll see an option for "Request Clearance." Click that and you'll receive your clearance.
6. Bring up the ATC menu and read back your clearance. You must read back all instructions from ATC. Note that if you hear a beep when you click on any ATC menu items, that means that another aircraft or controller is busy talking on the radio. As in the real world, you must wait for them to finish talking before you can talk. You must also respond within a reasonable amount of time or they will repeat their instructions.
7. Once you've received and read back your clearance, tune the COM1 radio to 121.70, the frequency for the ground controller at KSEA. You must call ground to receive a taxi clearance. Acknowledge his clearance and then look around you. You'll see yellow arrows painted on the ground directing you to where he wants you to go. Where the arrows stop, you must also stop and wait for further instructions.
8. Taxi to where the arrows are taking you. When you reach the side of the runway, ground will instruct you to contact the tower. Read back the command and then tune to the tower frequency of 119.90.
9. Go to the ATC menu and check in with this new controller. This is how you tell the controller you're now on his frequency waiting for his command. If there are aircraft using the runway, you will have to wait until they are done. This may take some time! At that time, Tower will call you and instruct you to cross 16L/34R and to taxi to 16C/34C. Respond and then start taxiing.
10. Upon reaching your departure runway, you will again have to wait until the runway is safe to use. Tower will then call you and give you your takeoff clearance. Respond and then depart. Unless otherwise instructed, fly the runway heading up to your cleared altitude of 3,000 feet.
11. At some point, you will be handed off to the center controller on 124.20. Check in with him in the same manner. Continue on your heading and altitude and eventually he will begin vectoring you to an approach at your destination of KBFI. Follow his commands.
12. Once the approach is set up, you will be handed off to KBFI's tower for landing and the process continues until you've arrived back at the gate.

6.3 Using ForeFlight for Real-Time Charts and Plates

New to X-Plane 10.10 is the ability to integrate with ForeFlight, a tool for real-world pilots to view charts and approach plates for their current location (or locations they plan to visit). When you install ForeFlight on your iPhone or iPad, though, you can connect it to X-Plane. X-Plane, in turn, will send a simulated GPS signal to the ForeFlight app, causing ForeFlight to behave as though you were actually flying in your location in X-Plane.

To connect ForeFlight to X-Plane, do the following:

1. Download ForeFlight from the App Store and copy it to your iPhone or iPad. Configure ForeFlight per their http://www.foreflight.com/support/pilots-guide.

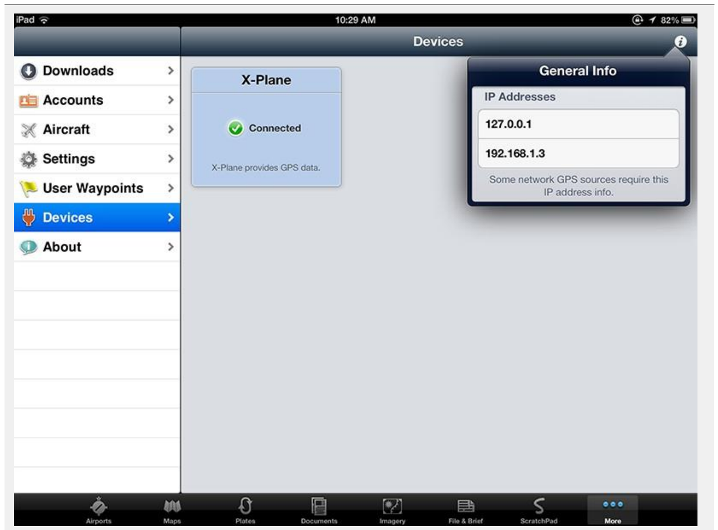

Figure 6.2: The ForeFlight settings after connecting to X-Plane [Full size →]

2. Connect your iPhone/iPad to the *same* wireless network as your computer that runs X-Plane.
3. Launch X-Plane on your computer, and launch ForeFlight on your iPhone/iPad.
4. In X-Plane, open the Settings menu and click Net Connections.
5. Select the "iPhone/iPad" tab in the Net Connections dialog box.
6. Check the box near the bottom of the screen labeled **send GPS data to ForeFlight Mobile or WingX Pro7 on ALL iPads or iPhones on the local network**. At this point, yellow text should appear in the top of the Net Connections window saying something like "Sending to a device running ForeFlight Mobile or WingX Pro7 at IP address 192.168.1.3 0.1 seconds ago, and the send was successful."
7. If you're using ForeFlight for iPad, click the **More . . .** button in the bottom right corner of the screen, then select the "Devices" tab. If you're using ForeFlight for iPhone, swipe over to the second list of buttons on the main menu and tap the **Devices** button.
8. If your devices are configured per the above steps, you should have a small square labeled "X-Plane" in the Devices window of ForeFlight, as seen in Figure 6.2. (Note that you may need to click on this box in order to enable the connection.) If this is not the case, make sure X-Plane is able to get through your firewall by following the steps in the section 'Allowing X-Plane through Your Firewall' of Chapter 4.
9. At this point, X-Plane and ForeFlight should be communicating, so if you tap the **Maps** or **Plates** buttons in ForeFlight, you will be able to track your aircraft's location. By tapping on a particular airport (or by looking it up in the **Airports** section of the app) you can get information such as radio frequencies that you can use in X-Plane. To center your the map

Figure 6.3: Using ForeFlight with X-Plane. Tapping the crosshairs button (highlighted in green in the upper right corner of the screen) will center the map view on your aircraft. [Full size →]

view on your aircraft, just tap the crosshairs button inthe upper right corner of the screen, highlighted in green in Figure 6.3.

6.4 Changing How and Where the Aircraft Starts

By default, X-Plane starts your aircraft with engines running on a runway, ready to take off. If you prefer to start your own engines or taxi from an apron (also called a ramp) onto the runway, you can do so by opening the Settings menu and clicking Operations & Warnings. There, in the pane labeled "Startup," you can un-check the box labeled **Start each flight with engines running** or check the box labeled **Start each flight on ramp**.

Note that not all aircraft models have engine starters built in to their instrument panels. If yours does not, you can either add one in Plane Maker, or you can simply come back to the Operations & Warnings menu and toggle the engine start box again.

6.5 Using a Checklist

X-Plane has the ability to display a simple checklist in the simulator. This checklist must be stored somewhere in the X-Plane directory as a plain text (.txt) file.

To load a check list, open the Special menu and click Open Checklist for Use. After locating your .txt file, you will see the checklist displayed line-by-line in the upper center of the screen. You can use the forward and back buttons to go to the next and previous lines, respectively. When you finish, you can go back to the Special menu and click Toggle Checklist for Use to hide the file.

If you prefer to see the text file all at once (rather than line-by-line as in the checklist view), you can select Open Text File for Viewing from the Special menu, then use Toggle Text File for Viewing to turn it on and off.

6.6 Changing How Damage Affects the Aircraft

By default, X-Plane does not remove parts of the aircraft when the craft's limits are exceeded. However, by opening the Operations & Warnings dialog box from the Settings menu, you can enable the following (located in the bottom left of the window):

- **remove flying surfaces in over-speed**, which causes X-Plane to remove wings and other flight surfaces when you exceed the aircraft's maximum speed by some percentage.
- **remove flying surfaces in over-G**, which causes X-Plane to remove wings and other flight surfaces when the g-forces acting on the aircraft exceed the rated maximum by some percentage.
- **remove flaps in over-V_{fe}**, which causes X-Plane to remove the flaps if they are extended at speeds greater than V_{fe} (the maximum flap extension speed, noted with a white arc on the airspeed indicator).
- **remove gear doors in over-V_{le}**, which causes X-Plane to remove the gear doors if they are extended at speeds greater than V_{le} (the maximum gear extension speed).

Additionally, with the **reset on hard crash** box checked, X-Plane will automatically reload your aircraft at the nearest airport in the event of a fatal crash.

By making these damage modeling features optional, X-Plane allows both easy, possibly unrealistic flights, as well as much more accurate, more challenging simulations.

6.7 Setting the Weight, Balance, and Fuel

To modify an aircraft's weight, balance, and fuel, move your mouse to the top of the screen, click on the Aircraft menu, and click Weight and Fuel.

The dialog box that appears will have the Fuel/Payload tab selected. Here, you can use the sliders to set the aircraft's center of gravity, the weight of its payload, and the amount of fuel in its tanks.

An airplane can typically stay in the air at very high weights, but it will have a hard time getting off the ground initially. Additionally, moving the center of gravity forward (left on the slider) makes the plane behave more like a dart, and moving the center of gravity aft (right on the slider) makes the plane more unstable, and potentially unflyable. Flying a plane with the center of gravity far aft is like shooting an arrow backwards—it wants to flip around with the heavy end in the front and the fins in the back.

Since X-Plane calculates in real time how the plane is burning fuel, and the engines need fuel to run, and the weight distribution of the fuel is considered in the simulation, the fuel put on board does indeed matter.

6.8 Simulating Equipment Failures

X-Plane can simulate countless aircraft systems failures. The Equipment Failures window, found in the Aircraft menu, lets you experience what happens when important pieces of equipment don't do what they're supposed to in flight.

The World/MTBF tab of the Equipment Failures window controls things outside of the airplane, such as bird strikes and airport equipment failures.

With the World/MTBF tab selected, the **mean time between failure** setting is visible at the bottom of the screen. When the **use mean time between random failures** box is checked, the simulator will use the value to the right to determine how often, on average, each piece of equipment will fail. For instance, if the MTBF is set to 1000 hours, X-Plane will decide that each piece of hardware in the plane has about a one in a thousand chance of breaking each hour. Since the airplane has a few hundred pieces of hardware, that means a failure might occur every 5 to 20 hours or so.

The other tabs in this window let the user set the frequency of such failures, or command specific failures, for hundreds of different aircraft systems.

The general failure categories are:

- Equipment
- Engines
- Flying Surfaces
- G1000 (if you have a real G1000 attached to X-Plane)
- All Instruments, and
- NAVAIDs

6.9 Enabling a Smoke Trail

A smoke trail, as might be used by an aerobatic airplane in an airshow, can be enabled behind your aircraft by opening the Aircraft menu and clicking Toggle Puff Smoke. This control is assigned to the 'x' key by default.

6.10 Speeding Up the Simulation

By pressing Alt+T on the keyboard, you can increase the simulation speed to 2× the standard speed. Pressing Alt+T repeatedly will increase the speed to 4×, then 6×, and then it will finally return the simulator back to standard speed.

Note that if your computer cannot run the simulation at the required frame rate, X-Plane will slow its measurement of time to compensate. This is seen most often for users running at standard speed, but failing to maintain 20 frames per second. When X-Plane runs slower than 20 fps, it slows down its simulation of real-time so that the simulator is "effectively" running at 20 fps. For instance, if the simulator is running at 10 fps due to extreme rendering settings, X-Plane will run the flight model at half speed. The result is that the physics are integrating in slow-motion in order to avoid destabilizing from the low framerate. Thus, if you need real-time simulation, you must run the simulator at 20 fps or faster.

6.11 Taxiing More Accurately

In commercial aircraft, a nosewheel tiller is used to more accurately align the nosewheel to the taxi lines, and to get the aircraft safely docked at jetways. You can assign an axis on your joystick to control this tiller by opening the Joystick & Equipment dialog box (from the Settings menu) and, in one of the drop-down menus in the Axis tab, selecting **nosewheel tiller**. Note that this is the same procedure used in setting up the joystick axes normally, as described in the section "Configuring Flight Controls" of Chapter 4.

Chapter 7

Navigation, Autopilots, and Flying on Instruments

People often call customer support asking about some of the more advanced things that pilots do in the real world—how to navigate, use an autopilot, or fly on instruments. This chapter will cover these areas in a fair amount of detail, but we recommend that, if you are really serious about mastering these facets of aviation, you head down to a local general aviation airport and hire a HOO (Certified Flight Instructor) for an hour or two. If you have a laptop, by all means bring it along and have the instructor detail these things in practice. There is much more to review here than this manual could ever cover, so a quick search for information on the Internet will also be of assistance.

7.1 Navigating

Navigating over the Earth' s surface is as easy as knowing where your aircraft is and how to get to where you want to go. This isn' t quite as easy as it sounds. Imagine that you' re flying IMC (Instrument Meteorological Conditions—that is, in the clouds). You have no reference to the ground and are flying over St. Louis in the middle of an overcast layer. As you might guess, this looks pretty much identical to the view you would have flying over Moscow on instruments. The only way to know that you' re over St. Louis and not over Moscow is to be able to navigate. Navigation is the art of being able to tell where your aircraft is and how to make it go where you' d like.

7.1.1 Air Navigation History

For the first 30 years or so the best pilots could do was to fly around using what is known as dead reckoning—that is, by confirming their position on a map as they flew, then looking ahead on the map to see when they should be crossing some known landmark, like a road, railroad, town, or lake. Then, the pilots periodically compared their progress over the real ground with the anticipated progress over the map to see how things were going. This really is as simple as it sounds. The biggest trick is to always know where you are and what to be looking for next.

Dead reckoning isn' t too difficult to get down. Shortly after college, Austin Meyer (the author of X-Plane) and Randy Witt once piloted a Cessna 172 from Kansas City to Chicago after their second (of two) navigation radios gave up and died in mid-flight. Clearly this is not a typical experience in the aviation world, but it' s a reminder that a pilot always needs to be thinking ahead and preparing for contingencies. That particular aircraft was a well-used rental and NAV 1 was dead from the

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time the plane was signed out. When NAV 2 died, there were no operable navigation radios at all, and the two had to use dead reckoning to fly the last 300 or so miles of their trip, which was most of the journey. They would never have allowed themselves to get into that position had the weather been poor or had they been flying on instruments—they would have refused to take off into such conditions given the failure in the first radio. But since the weather was nice, they took off with only one navigation radio and were soon flying along on none. X-Plane allows you to practice this all you like.

During the heyday of dead reckoning, the US Mail pilots that were flying on overnight mail routes actually flew from bonfire to bonfire that had been set up along their route, using the light to guide their progress. Just imagine what this must have been like-flying in the mid 1920s in an open cockpit biplane (a Curtis Jenny, perhaps) trying to keep your goggles clean (the engines of the day routinely sprayed oil) and to stay out of the clouds on a cold winter night, flying along a chain of bonfires to your next destination. Keep in mind these were not closed-cockpit aircraft and the pilot continually had the outside air blowing all around. Wow! I hope you dressed warm and that you are good at folding maps in 80 MPH slipstreams of below-freezing air.

In the mid 1930s or so a system was devised where pilots would fly using aural navigation—that is, they would tune into a new radio system such that if they were to the left of their course they would hear a series of dashes (long radio tones, as in Morse code), and if they were to the right of their course they would hear a series of dots (short tones). If on course, they would hear nothing as the signals containing the dashes and dots canceled each other out. The closer the pilot was to the transmitter the smaller the "Cone of Silence," as it was known, was and the more defined the boundaries between the dashes, dots, and silence. As the aircraft's range from the station increased, the central target (where no signals were heard) was much wider and weaker. Imagine sitting in a cold, dark cockpit listening intently to try and hear over the drone of the engine and whistle of the wind on your wires to see which side of the cone you were on. Airline pilots used this system for years to successfully carry passengers all around the world. This type of navigation is not modeled within X-Plane.

7.1.2 Modern Means of Navigation

We now come into the area of "modern" navigation based on ground-based transmitters. You'll need a good set of charts if you'd like to actually fly in X-Plane using any of these methods, but the software does contain a full set of (mostly) current charts as well. To see them go to the Location menu, click Local Map, and select one of the five map types that are available in the tabs on top of the window. They are:

- High-Speed—used as high altitude charts by jet and turbo-prop pilots.
- Low Enroute—used as low altitude IFR navigation charts by piston (propeller) aircraft pilots. One of the most important aspects of this chart is the addition of Vector Airways that are virtual highways in the sky that connect different VOR transmitters. These vector airways are given names (for example, V503) and are used by air traffic controls to assign clearances.
- High Enroute—very similar to Low Enroute but only showing the information of interest to pilots flying above 18,000 feet and making use of vector airways that are much longer, based on larger VORs with longer ranges.
- Sectional—the standard chart that VFR pilots are familiar with. This map has ground elevation data superimposed via a shaded background and information about the airports that are local to that area.

- Textured—a nice map that is not used in pilot circles. This overlays the X-Plane terrain images on top of the navigation charts to give the user a good bird' s eye view of the area he or she is flying over.

Note that the maps in X-Plane are covered in more detail in the section "Using X-Plane' s Navigation Maps" later in this chapter.

7.1.2.1 NDB Navigation

Non-directional beacons were invented in the late 1940s and consisted of a ground-based transmitter that broadcast a homing signal. A receiver in the aircraft could be tuned to one of about 300 discrete frequencies in order to tune to a particular transmitter. With that done, an instrument in the panel, called the NDB (or, interchangeably, the ADF, or Automatic Direction Finder), would point to the station. This system was a large technological leap forward over the older aural-based system and was actually quite easy to use, provided that the wind was perfectly calm or blowing in a direction that was exactly parallel to the direction of flight. Of course, that pretty much never happened, resulting in the aircraft always being blown off course. As a result, the pilots had to watch the trend of movement in the needle over a relatively long period of time (e.g., five to eight minutes) to see if the angle to the station that was depicted stayed constant or was changing. If it was changing, it indicated that the aircraft was being blown off course and the pilot had to turn in the opposite direction by half of the deviation. After holding that heading for another five minutes or so the pilot would again observe the relative trend of the needle and correct again.

The trick was to fly as straight as possible from one station to another. Although nearly abandoned in the United States, NDBs are still used in many countries around the world. It is for this reason that they are modeled in X-Plane.

An ADF is located in the instrument panel for the Cessna 172 that comes with X-Plane. It is located above the mixture knob and trim wheel, below the dual VOR CDIs.

7.1.2.2 VOR Navigation

Very High Frequency Omni-Range navigation (or VOR) was introduced in the mid-1950s and represented a large improvement in navigation accuracy. Instead of an NDB that a pilot could home in on, the VOR sends a series of 360 discrete little carrier tones on a main frequency. Each of these carriers is oriented along a different radial from the station, one of 360 just like a compass rose. Thus, when you are flying along and tune in the main VOR frequency, you then fine tune your navigation display to tell you which of the 360 radials you are flying and also whether the transmitter station is in front of or behind you. Impressive! This finally gave pilots a means of telling exactly where they were in relation to a fixed spot on earth, and this system "automatically" adjusted for any winds aloft as the system would quickly display any error in track that the plane was making. This error could only be due to two factors—either the pilot was not flying along the radial or the wind blew the airplane slightly off of course. VORs are modeled in X-Plane.

VOR stations appear in the X-Plane maps as relatively large circles with notches around the edges, similar to a clock face. They are tagged with boxes that have their name and identifier on the left side and their VOR frequency on the right.

A specific type of VOR, a VOR-DME, combines the lateral guidance (that is, guidance left and right) of a VOR with the distance guidance of a DME (distance measuring equipment). Another type of VOR beacon, a VORTAC, is also found throughout the X-Plane maps. This is a transmitter that combines both VOR and TACAN features. TACAN (or tactical air navigation) provides special information to military pilots similar to a civilian VOR. However, for our purposes, this is functionally identical to a VOR-DME.

To use a VOR, first look on either the sectional or low enroute map to find a VOR station that is fairly close the location of the aircraft. Tune this station's frequency into your VOR radio (in the Cessna 172SP, the NAV 1 radio is found on the far right of the cockpit, beneath the GPS). The little red 'nav1' or 'nav2' flags on your CDI (Course Deviation Indicator) should disappear (keep in mind that you may have to hit the flip-flop switch to bring the frequency you just tuned into the active window). Now rotate the OBS (Omni Bearing Selector) knob so that the vertical white indicator is perfectly centered in the little white circle in the middle of the instrument. At this point the vertical white line should be truly vertical and your aircraft is either on the radial from the station indicated by the arrow at the top or at the bottom of the instrument, labeled TO or FR. Now fly that exact heading and you will be flying directly towards or away from the station, as shown by the little white up or down (to or from, respectively) arrow that will be on the right side of the CDI, either above or below the white horizontal glide slope indicator.

Note that the vertical reference line indicates how far you are from your desired radial. To the left and right of the center target (the little white circle) the instrument displays five dots or short lines on each side. Each of these dots indicates that you are two degrees off of course. Thus, a full scale left deflection of the vertical reference indicates that the aircraft is 10 degrees right of the desired radial if the station is in front of you. Of course, if the station is behind you then the instrument is reverse sensing and that means that a left deflection indicates that the plane is to the left of your desired radial-yes, it can be a bit confusing. Just remember that *as long as you are flying towards the VOR, the line on the CDI indicates the location of the desired course*. If the reference line is on your left that means that your target radial is on your left.

With only one VOR you really don't know where you are along a given radial, only that you are in front of or behind a station and what radial you're on. You have no way of telling if you are 15 miles from the station or 45 miles away. The solution is to use two VOR radios so that you can plot your location from two different VORs. If you can determine that you're on the 67th radial from the OJC VOR and on the 117th radial from the MKC VOR then you can pinpoint your location on a sectional chart. Don't forget that you'll have to work fast as your position will be continually changing.

7.1.2.3 ILS Navigation

An ILS (or instrument landing system) differs from a VOR in that it provides both lateral guidance (left and right, as given by a VOR) and vertical guidance (up and down). An ILS is therefore made up of *two* transmitters, a localizer and a glideslope—one for each component of the navigation. Both these components of the ILS are tuned together; tuning an ILS is just like tuning in to a VOR.

A localizer (LOC) transmitter provides lateral guidance to the centerline of a runway. It works by sending out two signals on the same channel, one of which modulates at 90 Hz and the other of which modulates at 150 Hz. One of these signals is sent out slightly to the left of the runway, while the other sent out slightly to the right of it. If an aircraft is picking up more of the tone modulated at 150 Hz, it is off to the left. If it is picking up more of the tone modulated at 90 Hz, it is off to the right. The course deviation indicator (or CDI) in the instrument panel then indicates this so that the pilot can correct it. When both tones are being received in equal amounts, the craft is lined up with the physical centerline of the runway. These LOC transmitters do not necessarily have to be paired with a glideslope (thus making them an ILS).

An ILS combines the functionality of a localizer, which provides lateral guidance, with a glideslope transmitter, which provides vertical guidance to the runway. The glideslope beacon functions similarly to the localizer, sending out two tones that have the same frequency, but different modulations. The difference is that the glideslope tells the plane that it is either too high or too low for its distance from the runway. The pilot uses this information to push the craft' s nose up or down as needed. The ILS will allow a pilot to fly on instruments only to a point that is a half mile from the end of the runway at 200 feet (depending on the category of the ILS) above the ground. If the runway cannot be clearly seen at that point the pilot is prevented from executing a normal landing. If this happens, the pilot in real life is required to fly a "missed approach" and climb back to altitude in order to try again or go somewhere else.

7.1.2.4 GPS Navigation

The Global Positioning System was first created for the US military and introduced to the public in the early 1990s. This system consists of a series of satellites orbiting the Earth which continuously send out signals telling their orbital location and the time the signal was sent. A GPS receiver can tune in to the signals they send out and note the time it took for the signal to travel from the satellite to the receiver for several different satellites at once. Since the speed at which the signals travel is known, it is a simple matter of arithmetic to determine how far from each satellite the receiver is. Triangulation (or, rather, quadrangulation) is than used to determine exactly where the receiver is with respect to the surface of the Earth. In an aircraft, this information is compared with the onboard database to determine how far it is to the next airport, navigational aid (NAVAID), waypoint, or whatever. The concept is simple, but the math is not. GPS systems have turned the world of aviation on its head, allowing everyday pilots to navigate around with levels of accuracy that were unimaginable 20 years ago.

There are several types of GPS radios available, and about 11 of these have been modeled in X-Plane. While the intricate workings of the various GPS radios are complex, the basic principals are pretty consistent. If you want to navigate from one location to another just launch X-Plane, open the aircraft of your choice, then press the "Direct To" key on the GPS radio (sometimes shown as the symbol -D→) and enter the airport ID you' d like to navigate to. On the Garmin 430, entry is performed using the control knob on the bottom right of the unit. Use the outer knob to select which character of the identifier to modify, the use the inner knob to scroll through the characters (see the section "A Note on Radio Tuning" for more information on using the knobs).

The databases in these radios are not limited simply to the identifiers of the airports you may wish to fly to. You can enter the IDs for any VOR or NDB station you' d like, or the name of any waypoint or fix you' d like to go to.

7.2 Using X-Plane's Navigation Maps

X-Plane' s navigation maps come in a few different varieties, each of which is useful for a different situation. These navigation maps are found in the Local Map window, which is launched from the Location menu. This window is divided into five tabs, corresponding to the five different maps available: Hi-Speed, Low Enroute, High Enroute, Sectional, and Textured. Note that a discussion of the elements of these maps (the ILS, VOR, and NDB beacons) can be found above, in the section "Modern Means of Navigation."

The Hi-Speed map gives maximum speed. It is useful for scrolling around the map quickly, changing NAVAIDS quickly, or, if the "Draw Cockpit on Second Monitor" option is checked in the Rendering Options screen, using the map drawn on one monitor while flying in the cockpit drawn on the other. In this case, the fastest map available is desirable so that the simulation is not slowed down too much.

The Low Enroute map displays the aircraft's general area, along with airports, airport and beacon frequencies, ILS indicators, and low level airways.

The High Enroute map is essentially the same as the Low Enroute view, but it displays the medium and high level airways instead of low level ones.

The Sectional map is designed as a VFR sectional chart. It shows airports, airport and beacon frequencies, ILS indicators, roads, rivers and railway lines. It also uses a terrain shader to depict the ground types and elevations.

The Textured map displays airports, roads, rivers and railway lines. In addition, the terrain shader used on this map gives an overview of the landscape as it would be seen from the cockpit in X-Plane. This view uses the actual scenery installed in X-Plane as its basis.

To move your view around a map, you can either click the map and drag (similar to the way you click and drag in many PDF readers), or you can use the arrow keys on the keyboard. You can also zoom in and out using the '-' and '=" keys.

Additionally, you can use the viewing control buttons located in the bottom right corner of the map window to alter your view. Below these checkboxes is a round button used to move the map view up, down, left, or right, depending on where along its edge the button is clicked. The buttons below this each have two small triangles. On the left is the button to zoom out, and next to it (labeled with two larger triangles) is the one to zoom in.

Finally, below the zoom buttons is the **center on acft button**, which, when clicked, centers the map on your aircraft.

7.2.1 Additional Features of the Maps

You can control what features of the map are shown using the checkboxes on the right side of the screen. These boxes toggle things like clouds, NAVAIDs, aircraft, and airports.

At the top of the Local Map window is a row of check boxes which are used to put the map in different "modes."

The **Instructor Operator Station (IOS)** check box puts the map in Instructor Operator Station mode, causing this copy of X-Plane to run as an instructor's console. Once this box is checked, the left side of the Map window will show a number of buttons with which to control the flight. The instructor can enter an airport ID in the space in the upper left. With an ID entered, the aircraft can be placed at the airport or on an approach to it.

The Instructor's Console can be used either when drawing a two monitors from the same video card or in a multi-computer X-Plane setup. This is a great feature for flight training because the instructor can fail systems, set date and time, change the aircraft location, etc. for maximum training benefit. The buttons along the left of this window allow the instructor to perform all these tasks from one location, while maintaining a watch on the X-Plane pilot using the map view.

The **edit** check box opens a number of buttons on the left side of the screen which are used to edit the various NAVAIDS on the map. Just click on a NAVAID to modify it, or to add a new one. For a detailed description of the format used in the NAVAIDs on the Local Map, please see the X-Plane Airport and Navigation Data website.

Enabling the **slope** check box will display a vertical profile of the flight at the bottom of the map screen.

The **inst** check box makes a few key flight instruments appear within the map screen in order to see what the plane is doing. By default, opening the map screen pauses the simulation, though, so in order to use the map (and thus these gauges) in real time, one of the following must be done:

1. The **draw IOS on second monitor** option must be enabled in the Rendering Options screen, thus setting one of your available monitors to be used for flight and the other for an instructor operator station.
2. A networked IOS must be set up using the IOS tab of the Net Connections window.

Note that more information on these multi-monitor simulator setups can be found in the section "Using an Instructor Operator Station (IOS) for Flight Training" of Chapter 8.

Toggling the **3-D** check box will shift the map into 3-D mode. When in 3-D view mode, the arrow keys can be used to rotate the view and the '+' and '-' keys to zoom in and out.

Finally, the **shut down tailwind ILSs** box can be used to ignore the ILSs which are not aimed in the direction you need. This is useful if you are flying at an airport with ILSs in opposite directions on the same frequency, as is the case at KLAX.

7.3 Using the Autopilot

One of the most frequently asked questions from X-Plane users is the same as one of the most frequently asked questions from real-world pilots—how do I work the autopilot? Many pilots have simply never taken the time to learn—you might even find some real-world airliners jerking left and right for five minutes or so as the flight crew tries to figure out how to program and engage their autopilot.

The autopilot works by implementing a number of different functions. These include, among other things, the ability to automatically hold a certain pitch, altitude, heading, or speed, or to fly to a commanded altitude.

The following autopilot functions are available in X-Plane. A button for enabling each of these can be chosen for an aircraft's panel using the Panel Editor of the Plane Maker software. In the Panel Editor, these buttons are located in the "autopilot" instrument folder. Each of these is a mode that the aircraft can be put into simply by clicking that button on the panel with the mouse. The actual use of these autopilot functions will be discussed in the following sections.

The **WLV** button is the wing leveler. This will simply hold the wings level while the pilot figures out what to do next.

The **HDG** button controls the heading hold function. This will simply follow the heading bug on the HSI or direction gyro.

The **LOC** button controls the localizer flight function. This will fly a VOR or ILS radial, or to a GPS destination. Note that the GPS may be programmed by the FMS (discussed in the section "Flying an FMS Plan").

The **HOLD** button controls the altitude hold function. This will hold the current or pre-selected altitude by pitching the nose up or down.

The **V/S** button controls the vertical speed function. This will hold a constant vertical speed by pitching the aircraft's nose up or down.

The **SPD** button controls the airspeed function. This will hold the pre-selected airspeed by pitching the nose up or down, leaving the throttle alone.

The **FLCH** button controls the flight-level change function. This will hold the pre-selected airspeed by pitching the nose up or down, adding or taking away power automatically. This is commonly used to change altitude in airliners, as it allows the pilot add or take away power while the airplane pitches the nose to hold the most efficient airspeed. If the pilot adds power, the plane climbs. If they take it away, the plane descends. **SPD** and **FLCH** are almost identical functions in X-Plane—they both pitch the nose up or down to maintain a desired aircraft speed, so adding or taking away power results in climbs and descents, respectively. The difference is that if you have auto-throttle on the airplane, **FLCH** will automatically add or take away power for you to start the climb or descent, whereas **SPD** will not.

The **PTCH** button controls the pitch sync function. Use this to hold the plane's nose at a constant pitch attitude. This is commonly used to just hold the nose somewhere until the pilot decides what to do next.

The **G/S** button controls the glideslope flight function. This will fly the glideslope portion of an ILS.

The **VNAV** button controls the vertical navigation function. This will automatically load altitudes from the FMS (Flight Management System) into the autopilot for you in order to follow route altitudes (as discussed in the section "Flying an FMS Plan" below).

The **BC** button controls the back course function. Every ILS on the planet has a little-known second localizer that goes in the opposite direction as the inbound localizer. This is used for the missed approach, allowing you to continue flying along the extended centerline of the runway, even after passing over and beyond the runway. To save money, some airports will not bother to install a new ILS at the airport to land on the same runway going the other direction, but instead let you fly this second localizer backwards to come into the runway from the opposite direction of the regular ILS! This is called a back course ILS.

Using the same ILS in both directions has its advantages (e.g., it's cheaper), but there's a drawback: the needle deflection on your instruments is backwards when going the wrong way on the ILS. Hit the **BC** autopilot button if you are doing this. It causes the autopilot to realize that the needle deflection is backwards and still fly the approach.

Note that HSIs *do not* reverse the visible needle deflection in the back-course; you must turn the housing that the deflection needle is mounted on around 180 degrees to fly the opposite direction.

Note also that the glideslope is not available on the back course, so you have to use the localizer part of the procedure only.

7.3.1 Turning It On and Off

Before using the autopilot, it needs to be turned on. The autopilot power switch is labeled "Flight Director Mode," or simply "FLIGHT DIR." It has OFF, ON, and AUTO modes.

If the flight director is OFF, nothing will happen when you try to use the autopilot. If it is ON, then the autopilot will *not* physically move the airplane controls, but will rather move little target wings on your artificial horizon that you can try to mimic as you fly. If you do this, you will be following the guidance that the autopilot is giving you, even though you are the one actually flying. The flight director, then, is following whatever autopilot mode you selected, and you, in turn, are following the flight director to actually fly the plane. If the flight director is set to AUTO, then the autopilot servos will actually fly the airplane according to the autopilot mode you have selected.

In other words, turning the flight director ON turns on the brains of the autopilot, displaying the commands from the modes above on the horizon as little magenta wings you can follow. Turning the Flight Director switch to AUTO turns on the servos of the autopilot, so the plane follows the little magenta wings for you without you touching the stick.

Therefore, if you have a flight director switch, make sure it is in the right mode for the type of autopilot guidance you want—none, flight director only, or servo-driven controls.

When you first turn the flight director to ON or AUTO, it will automatically engage in the pitch sync and wing leveler modes, which will simply hold the craft's current pitch and roll until some other mode is selected. If the system is turned on with less than 7 degrees of bank, however, the flight director will assume you want the wings level, and it will automatically do so for you.

With the flight director set to the right mode, you can engage the autopilot functions by simply pressing the desired button in the instrument panel. To turn off an autopilot function, simply hit its button once again. When all other autopilot functions are turned off, the autopilot will revert to the default functions—pitch and roll hold modes.

To turn the autopilot off altogether, simply turn the FLIGHT DIR switch to OFF. Alternatively, assign a key or joystick button to turn it off in the Joystick & Equipment dialog box of X-Plane.

7.3.2 Using the Controls

With the autopilot turned on (either to the flight director-only mode or the servo-driven control mode), you are ready to use the autopilot functions. We will discuss when it would be appropriate to use some of the most common functions.

7.3.2.1 Wing Leveler and Pitch Sync

Hit either the wing leveler (**WLV**) or the pitch sync (**PTCH**) to hold the current roll and pitch attitude, respectively. This is useful when switching between autopilot functions.

7.3.2.2 Heading, Altitude, Vertical Speed, Speed Hold, Flight Level Change, and Auto-Throttle

Hit the heading hold (**HDG**), altitude hold (**ALT**), vertical speed (**V/S**), speed hold (**SPD**), flight level change (**FLCH**), or auto-throttle (**ATHR**) buttons and the autopilot will maintain whatever values are entered into their respective selectors. For the sake of smooth transitions, many of these values will be set by default to your current speed or altitude at the moment the autopilot function buttons are hit.

If you want the autopilot to guide the aircraft to a *new* altitude, you have to ask yourself: Do you want the airplane to hold a constant vertical speed to reach that new altitude, or a constant airspeed to reach it? Since airplanes are most efficient at some constant indicated airspeed, climbing by holding a constant airspeed is usually most efficient.

Regardless, we'll start with the vertical speed case.

Imagine you are flying along at 5,000 feet and you hit ALT, causing the autopilot to store your current altitude of 5,000 feet. Now, though, you want to climb to 9,000 feet. You would first dial 9,000 into the altitude window. The plane will not go there yet; before it will, you must choose how you want to get to this new altitude.

If you decide to get there via a constant vertical speed, hit the V/S button and the plane will capture your current vertical speed (possibly 0). Then, simply dial the VVI (vertical velocity indicator) up or down to set how fast your will reach your target of 9,000 feet. When you get to 9,000 feet, the autopilot will automatically disengage the vertical speed mode and drop right back into altitude mode at your new altitude.

Now, to get to your new altitude via a given airspeed (as airliners do), after dialing in 9,000 feet in the altitude window, you would hit the FLCH or SPD buttons. This will cause the plane to pitch the nose up or down to maintain your current indicated airspeed. Now, simply add a dose of power (if needed) to cause the nose of the plane to rise (which the autopilot will command in order to keep the speed from increasing). When you reach 9,000 feet, the autopilot will leave speed-hold mode and go into altitude-hold mode, holding 9,000 feet until further notice.

As you can see, both the airspeed and vertical speed modes will be maintained until you reach the specified altitude, at which point the autopilot will abandon that mode and go into altitude-hold mode. The same thing will happen with the glideslope control. If the glideslope is armed (that is, lit up after you pushed the button), then the autopilot will abandon your vertical mode when the glideslope engages. This will also happen with the localizer control. If the localizer is armed, the autopilot will abandon your heading mode when the localizer engages. This is referred to as "capturing" the localizer or glideslope.

The key thing to realize is that the vertical speed, flight level change, and heading modes are all modes that command the plane the moment they are engaged. Altitude, glideslope, and localizer, on the other hand, are all armed (in standby) until one of the modes above intercepts the altitude, glideslope, localizer, or GPS course.

An exception to the above rule is altitude. If you hit the altitude button, the autopilot will be set to the current altitude. This is not the way a smart pilot flies, though. A smart pilot with a good airplane, a good autopilot, and good planning will dial in the assigned altitude long before he or she gets there (including the initial altitude before take off) and then use vertical speed, flight level change, or even pitch sync to reach that altitude.

Here is how the system in a real plane would be used (and thus how the system in X-Plane is best used):

1. While on the ground, short of the runway, the you are told to maintain, say, 3,000 feet. You are given a runway heading and is cleared for takeoff.
2. You enter 3,000 feet into the ALTITUDE window and a runway heading (for instance, 290) into the HEADING window.
3. You take off.
4. In the initial climb, around maybe 500 feet, you set the flight director to AUTO. The autopilot notes the plane's current pitch and roll and holds the plane steady.
5. You hit the **HDG** button, and the plane follows the initial runway heading.
6. You hit either the **V/S**, **FLCH**, or **SPD** button. The autopilot automatically notes the current vertical velocity or airspeed, and the plane flies at that airspeed or vertical velocity until it gets to 3,000 feet, where it levels off.
7. You are given a new heading and altitude by ATC.
8. You dial the new heading into the window, dial the new altitude into its window, and then hit **V/S**, **FLCH**, or **SPD** to let the plane zoom to the new altitude.
9. You are cleared to the plane's destination or some other fix. You enter those coordinates into the GPS and the HSI source is set to GPS (since the autopilot follows the HSI). You hit the **LOC** button. The autopilot will then follow the HSI needle deflection laterally as it climbs to the new altitude.

Do this, and you can get where you are going.

7.3.2.3 Pitch Sync with the Pitch Sync Joystick Button

You can assign a joystick button to the pitch sync (**PTCH**) control. When pressed, this button will make the autopilot match its settings to whatever you are doing as you fly the plane. Then, when you release the pitch-sync joystick button, the autopilot servos will take hold of the yoke and maintain the vertical speed, altitude, airspeed, or pitch that you were just flying.

Instructions on assigning a joystick button to this function can be found in Chapter 4, in the section "Assigning Functions to Buttons."

Here's how the pitch sync works. Imagine you are at 3,000 feet. The flight director is in altitude mode, so the autopilot is holding 3,000 feet for you. You hit the pitch sync joystick button. When you do this, the autopilot servos release control of the yoke and let you fly. You fly to 3,500 feet (with the autopilot still in altitude mode) and let go of the pitch sync joystick button. At that point, the autopilot will hold 3,500 feet, since you were in altitude mode at 3,500 feet at the moment you let go of the pitch sync button.

If you are in vertical speed mode, the autopilot will try to maintain the vertical speed that you had at the moment you released the pitch sync button.

If you are in speed or level change mode, the autopilot will try to maintain the airspeed (by pitching nose up or down) that you had at the moment you released the pitch sync button.

So, when you press the pitch sync joystick button, the autopilot turns the servos *off* and lets you fly, but when you *release* the button, the servos take hold and try to maintain the speed, altitude, or vertical speed that you had at the moment when you released the pitch sync joystick button. The same applies to bank angle. If you are in wing level or heading mode when you hit pitch sync, then the plane will try to maintain the bank angle you had at the moment you released the button.

Note, once again, that if the plane's bank angle is less than 7 degrees, the autopilot will just level the wings, as it assumes that you want nose level.

7.3.2.4 Localizer and Glideslope

These are the options that nobody can figure out, partially because the right frequencies and HSI mode must be selected to use them, and partially because they will do nothing until they capture the approach path they are looking for. For that to happen, some other mode (any of the ones discussed above) must be engaged to do that.

These modes capture an ILS, VOR, or GPS course, so they must obviously be able to fly either NAV 1, NAV 2, or GPS. The autopilot only knows which of these three to use when you tell it which one. This is done with the button labeled "NAV-1 NAV-2 FMC/CDU" (with filename "but HSI 12GPS" in the Panel Maker's HSI folder), which is the HSI source selector.

Note: In some aircraft, this is instead a three-position switch labeled SOURCE.

The autopilot will fly whatever course the HSI is showing (if you have one), so you need to decide what you want the HSI to show: NAV 1, NAV 2, or GPS (labeled FMC/CDU, for Flight Management Computer, which gets its signal from the GPS). Once you decide, use this button to tell the HSI what to display. The autopilot will then fly to that course.

If you set this button to NAV 1, the HSI will show deflections from the NAV 1 radio, and the autopilot will fly VOR or ILS signals from the NAV 1 radio when you hit the **LOC** or **G/S** buttons.

Similarly, if you set this to NAV 2, then the HSI will show deflections from the NAV 2 radio, and the autopilot will fly VOR or ILS signals from the NAV 2 radio when you hit the **LOC** or **G/S** buttons.

If you set this switch to FMC/CDU, then the HSI will show deflections from the GPS, which can be set manually or by the FMS, and the autopilot will fly to the GPS destination when you hit the **LOC** button. Remember that if you enter destinations into the FMS, they will automatically feed into the GPS, so the autopilot will follow them if you select **LOC**.

To repeat: be sure to send the right signal (NAV 1, NAV 2, or GPS) to the autopilot when using the **LOC** and **G/S** (lateral and vertical navigation) buttons.

The **LOC** button will immediately begin lateral navigation (navigating to a GPS destination) once engaged. It will, however, only track a VOR radial or ILS localizer after the needle has come off of full-scale deflection. This means that if you have a full-scale ILS needle deflection (simply because you have not yet gotten to the localizer) the localizer mode will simply go into armed (yellow) mode, and will not do anything yet to the plane. Your current heading or wing level mode (if engaged) will remain in force (or you can fly by hand) until the localizer needle starts to move in towards the center. Once that happens, the **LOC** will suddenly go from armed mode (yellow) to active mode. This causes the autopilot to start flying the plane for you, disengaging any previous modes.

The reason that the localizer function disengages previous modes is that you will typically fly heading mode until you get to the localizer, and as soon as the localizer needle comes in, you want the autopilot to forget about heading and start flying the localizer down to the runway. Alternatively, you may simply fly the plane by hand to the localizer (with no autopilot mode on at all) and have the autopilot take over once the ILS needle starts to come in, indicating you are entering the localizer. Interestingly, this is much the same as the altitude modes. Just as the localizer is armed by hitting the **LOC** button, and you can do anything until the localizer arms take over lateral control, the altitude is also armed (always and automatically) and you can fly any vertical speed, airspeed, or pitch (manually or on autopilot) until the altitude is reached, at which point the autopilot will go into altitude hold mode.

Just like the lateral navigation (that is, the localizer function), the vertical navigation (glideslope, or **G/S** mode) will not do anything until the glideslope needle starts to move. Unlike with the localizer, though, the glideslope function won’t do anything until the glideslope needle goes all the way through the center position. It does this because you typically have the airplane on altitude hold until you intercept the glideslope, at which point the plane should stop holding altitude and start descending down to the runway. In other words, the glideslope function will automatically go from armed to active once the plane hits the center of the glideslope.

Let’s now put the **LOC** and **G/S** functions into use to fly an ILS.

7.3.3 Flying an ILS Using LOC and G/S

To fly an ILS, do the following while still far away from the ILS and below glideslope:

1. Hit the **ALT** button to hold the current altitude.
2. Enter a heading in the heading window to be followed until you intercept the ILS.
3. Hit the **HDG** button to hold that heading.
4. Hit the **LOC** button. It will go to “armed” (yellow).
5. Hit the **G/S** button. It will also go to “armed” (yellow).
6. As soon as you intercept the localizer, the **LOC** button will go from yellow to green, abandoning the heading mode to instead fly the localizer.
7. As soon as you intercept the center of the glideslope, the **G/S** button will go from yellow to green, abandoning the altitude hold mode to instead fly the glideslope.
8. The autopilot will track you right down to the runway, and even flare at the end, cutting power if auto-throttle is engaged.

Just as in a real airplane, these things only work well if you:

- intercept the localizer far away (outside of the outer marker) and below the glideslope,
- intercept the localizer at less than a 30° angle, and
- hold altitude when you intercept the glideslope.

If you come in above the glideslope, cross the localizer at a wide angle, or intercept the localizer too close to the airport, the autopilot will not be able to maneuver the airplane for landing (again, just as in a real plane).

Now that we've detailed flying with the autopilot, let's talk about flying an FMS (flight management system) plan.

7.3.4 Flying an FMS Plan

To fly a flight management system plan, a few things must happen:

1. You must enter your entire flight plan into the FMS.
2. You have to have the HSI set to GPS, *not* NAV 1 or NAV 2 (because the autopilot will fly whatever it sees on the HSI).
3. You must have the **LOC** button selected ON since that button causes the autopilot to follow the localizer (or whatever is on the HSI).
4. You must have the FLIGHT DIR switch set to AUTO, so that the servos are running.
5. You must hit the **VNAV** button *if* you want the FMS to also load altitudes into the altitude window.

Do all these things and the plane will follow any FMS plan, assuming, of course, that the plane you are flying has all this equipment (which of course some do not).

To demonstrate the use of an FMS, we'll go through the procedure in a typical aircraft (a Boeing 777). The steps will be similar in any aircraft.

1. Open up the Boeing 777 using the Open Aircraft dialog box. It is found in the Heavy Metal aircraft folder.
2. The FMS is found on the right half of the screen, near the middle of the panel (it should be displaying the text "PLAN SEGMENT 01"). Hit the **INIT** button on the FMS. This gets the FMS ready to receive a flight plan.
3. Now hit the **AIRP** button, telling the FMS that you are about to go to an airport.
4. Now enter the ID of the destination airport by hitting the keypad keys with the mouse. Let's imagine we are starting at San Diego International Airport (KSAN) and flying to San Bernardino International (KSBD).
5. If you like, hit the line-select button on the left side of the FMS next to the text "FLY AT ____FT" and enter the altitude you want to fly at using the keypad.

6. Now, if you want to do more than just fly to an airport, hit the **NEXT** button on the FMS and repeat the steps above for the next waypoint.

   There is a back arrow to erase mistakes, as well as **VOR**, **NDB**, **FIX**, and **LAT/LON** buttons to enter those types of destinations. The **PREV** and **NEXT** buttons will cycle through the various waypoints in your plan, and the **LD** and **SA** buttons will load or save flight plans if you would like to use them again.

7. Once you have entered the plan into the FMS, take off and set the SOURCE switch for the HSI (found near the left edge of the panel) to GPS so that the HSI is getting data from the GPS (rather than the NAV 1 or NAV 2 radios).

8. Move the FLIGHT DIR switch to AUTO so the autopilot servos are actually running, and hit the **LOC** autopilot button (at the top of the panel) to follow the HSI lateral guidance (which was just set to get data from the GPS), with the servos actively flying the plane. If you entered an altitude into the FMS, you'll also need to hit the **VNAV** autopilot button to track the entered altitude.

9. Sit back and let the autopilot take you to your destination.

7.4 Flying on Instruments

Though for a long time considered impossible in aviation circles, the ability to fly an aircraft through a large cloud or fog bank relying completely on the aircraft's instruments was made possible in the 1920s. Before then, nearly everyone that attempted this had become just another part of the wreckage, smoldering in a field. Now it is commonplace for even relatively inexperienced pilots to fly long distances in clouds. An instrument rating only requires 125 hours total flight time—although it would certainly not be wise for a 130- or 140-hour pilot to attempt an instrument approach in a 200 ft overcast with 1⁄2 mile visibility or to take off on a foggy day. Modern gyroscope-based instrumentation and continual training make it possible to safely fly with reference to only the instrument panel.

7.4.1 Keeping a Sense of Balance

To begin a discussion on instrument flight, we must first discuss why it is so difficult. It isn't that the principles behind flying on instruments are so difficult or that interpreting what the instruments are telling you is that difficult. Rather, the difficulty lies in believing what the instruments are saying. Your body had developed a system of balance and equilibrium that has evolved in humans over millions of years, and forcing your brain to ignore these signals and to believe what the instruments are telling you is very difficult. To put it bluntly, in a real aircraft, your life depends on ignoring your feelings and senses and flying based solely on the information in front of you.

This is why it's so difficult. Your sense of balance comes from three sources within your body. These are, in order of prerogative, your inner ear, your eyes, and your sense of touch and even hearing. You should remember from high school that your inner ear is a series of semi-circular canals that are filled with fluid. They are positioned in your head in different planes and each is lined with thousands of small hairs. The root of each hair is connected to your nervous system. As your body changes position in space, the fluid is moved due to momentum. The resulting bending of these hairs feeds your brain signals that indicate the orientation of your head in space. This information is continually updated and corrected by what your eyes are sending your brain as well as by your sense of touch. While standing stationary on the ground, your ears tell you that your head is positioned vertically and not moving, your eyes tell you that the ground is stationary beneath your feet, and the skin on the bottom of your feet tells you that it is standing on the ground. All of these inputs align to say the same thing-that you' re standing on the ground.

One limitation to your sense of balance is seen when you are accelerating very slowly, or when you accelerated briefly and have now stopped. Think of a post on a playground that stands vertically in the sand with a seat affixed to it a couple feet from the ground. It can be extremely disorienting to sit on the seat, close your eyes, and then have someone spin you at a constant rate. It doesn' t matter if you' re being spun to the left or the right-what is critical is that you are quickly accelerated and then kept at a constant angular velocity. When you first begin to spin, your inner ear will detect that you are accelerating and spinning. Before long, however, the fluid in your ears will stop moving, since you are no longer accelerating but rather just spinning. Stay like this for a few seconds and it will fell like you' re just sitting stationary. You may still feel a breeze on your face or hear sounds "spinning" about you, but your inner ear will be telling your brain that you' re sitting stationary and your brain will believe it. Now if you' re suddenly stopped, you will instantly feel an incredible sense of angular acceleration in the opposite direction, like you are being spun wildly the other way. Open your eyes and they will tell your brain that you are stationary, but the feeling within your head (a primal, driving sensation) is that you have just started to spin. In scientific circles, this is called "vertigo," but the sensation is commonly referred to as being dizzy.

The same thing can happen in a cockpit pretty quickly. Imagine for a moment that there is a large bank of clouds in front of you on a calm day. With a few passengers on board you can enter the cloud in a left bank of, say, 20°. Then, after entering the cloud very slowly and very smoothly, you start to bank the aircraft to the right. If you do this slowly and smoothly enough, no one on board will notice. Before you come out of the cloud, you get to a substantially different attitude (perhaps banked 30° right). The unsuspecting passengers may feel the very beginning of the change in bank, but they will probably suspect you' re banked to the left. When you suddenly fly through the other end of the cloud, they' re suddenly in a right-hand turn! While this was fun and harmless to do to unsuspecting friends in college, it underlines the difficulty that unsuspecting pilots can find themselves in if they are not careful.

7.4.2 Gyroscopes and Their Application in Flight

The gyroscope was invented many decades before aircraft, but its tremendous implications for flying were not realized until the mid- to late-1920s. The basic principal that they work on is that if you take a relatively heavy object and rotate it at a high rotational velocity it will hold its position in space. You can then mount this stable, rigid gyroscope in an instrument that is fixed to your aircraft and measure the relative motion of the instrument case (and thus the airplane) about the fixed gyro. The gyroscope is physically attached to an indicator of some sort, and these indicators then relay critical information to the pilot concerning the aircraft' s attitude (that is, its orientation relative to the horizon). There are three primary gyroscopic instruments in the panel. They are:

- the attitude indicator (or AI, normally driven by a vacuum pump on the engine),
- the turn coordinator (or TC, typically electrically driven), and
- the directional gyro (or DG, typically vacuum powered, though possibly electric).

The AI indicates what attitude the aircraft is flying at—how far the nose is above or below the horizon, as well as how far the wings are banked and in which direction. The TC indicates the rate of turn—that is, how steep or shallow your bank is in relation to a standard 2 minute turn rate, and the DG is nothing more than a gyroscopically driven compass that is more stable and accurate than the old standby, the magnetic (or "whisky") compass.

7.4.3 The Primary Flight Instruments

There are six primary instruments that have become standard in any instrument panel. Since the early 1970s, these have been arranged in a standard layout referred to as "the six pack." They are laid out in two rows of three instruments each. The top row, from left to right, contains the airspeed indicator (ASI), the attitude indicator (AI) and the altimeter (ALT). The bottom row contains the turn coordinator (TC) the directional gyro (DG) and the vertical speed indicator (VSI).

The airspeed indicator shows the speed at which the aircraft is traveling through the air. In its simplest form, it is nothing more than a spring which opposes the force of the air blowing in the front of a tube attached under the wing or to the nose of the aircraft. The faster the airplane is moving the stronger the air pressure is that acts to oppose the spring and the larger the deflection of the needle from which the pilot reads the craft's speed. Obviously, it's quite a bit more complicated than this, as the pressure exerted by the stream of air varies with the local air density (which continually changes as the airplane climbs or descends), and the ASI must account for this.

The attitude indicator informs the pilot of his or her position in space relative to the hori- zon. This is accomplished by fixing the case of the instrument to the aircraft and measuring the displacement of the case with reference to a fixed gyroscope inside.

The altimeter looks somewhat like the face of a clock and serves to display altitude. This is measured by the expansion or contraction of a fixed amount of air acting on a set of springs. As the airplane climbs or descends, the relative air pressure outside the aircraft changes and the altimeter reports the difference between the outside air pressure and a reference, contained in a set of airtight bellows.

The turn coordinator measures the rate of turn for the aircraft. The instrument is only accurate when the turn is coordinated-that is, when the airplane is not skidding or slipping through the turn. A skid is the aeronautical equivalent to a car that is understeering, where the front wheels do not have enough traction to overcome the car's momentum and the front of the car is thus plowing through the turn. In a car, this results in a turn radius that is larger than that commanded by the driver. A slip is a bit more difficult to imagine unless you're a pilot already. It results from an aircraft that is banked too steeply for the rate of turn selected. To correct the slip, all the pilot has to do is increase back pressure on the yoke, pulling the airplane 'up' into a tighter turn, such that the turn rate is in equilibrium with the bank angle.

The directional gyro is a simple instrument that points north and thus allows the pilot to tell which way she or he is flying.

The vertical speed indicator reports the craft's climb or descent rate in feet per minute. Typi- cally, non-pressurized airplanes will climb comfortably at about 700 fpm (if the plane is capable) and descend at about 500 fpm. Descent rates faster than this cause discomfort on the occupants which is felt in passengers' ears. Pressurized airplanes can climb and descend much more rapidly and still maintain the cabin rate of change at about these levels, since the cabin altitude is not related to the ambient altitude unless the pressurization system fails.

7.5 Flying an Instrument Approach in X-Plane

Nearly all of the airplanes included with X-Plane have basic navigation radios and instruments built into them, and all of these are used in more or less the same way. We will go through an example for flying an ILS approach (that is, an approach using an instrument landing system) to the default airport (Seattle-Tacoma International, identifier KSEA), but similar steps can be used for any airport in any application.

7.5.1 Setting Up the Approach

To begin, move your mouse to the top of the screen (causing the menu to appear), and click Location, then Select Global Airport. Just like in the Quick Flight Setup window, you can search for an airport either by name or by ICAO identifier. Unlike in the Quick Flight Setup window, though, the bottom half of this window displays rows of "quick start" buttons. The buttons in the "Takeoff" column (on the far left) will transport your aircraft to the specified runway, while the buttons just to the right of the Takeoff column are the "Final Approach" buttons. Clicking one of these will transport your aircraft to the specified distance away from the runway on the buttons left.

So, let's fly a full final approach. Search for KSEA (the default airport), and click one of the buttons labeled **10 nm**. X-Plane will put your airplane 10 nautical miles from that runway, at a decent altitude.

7.5.2 Finding the Frequencies

To fly an instrument approach, we first need to know the local navigational aid (NAVAID) frequencies. To find this, move your mouse to the top of the screen, causing the menu to appear. Click Location, then Local Map.

The map in the window that appears shows the ILS, LOC, VOR, and VORTAC frequencies for the area. Zoom in and out of the map by moving your mouse over the map and scrolling with the scroll wheel on your mouse (or by pressing the -- and + keys on the keyboard). To pan the map, simply click on a part of it and drag the mouse.

Now, Sea-Tac is a busy airport, so you may have to zoom in to find the ILS for the runway you are approaching. When you find the ILS, though, you can click on it to highlight in red the ILS path that it will help you fly. If you chose to fly into runway 16L, the frequency to use is 110.30 Hz. If you chose 16C, use 111.70. For 16R, use 110.75. For 34L, use 110.75. For 34C, use 111.70, and for 34R, use 110.30. (Remember this frequency, because we'll need it when setting up our instruments!)

Recall from the discussion of ILSs previously in this chapter that an ILS combines the functionality of a localizer (providing lateral guidance to the centerline of the runway) with a glideslope transmitter (providing vertical guidance down to the runway).

7.5.3 Setting Up the CDI or HSI

Having found the relevant ILS frequency, tune your NAV1 navigation radio to that frequency (per the section "**??**" of Chapter 5). Then, make sure your navigation source selector switch (labeled "Source") is pointing at NAV1 (and if it is not, click it to switch it).

Now let's discuss the instruments we'll use to follow this ILS.

The default aircraft in X-Plane will either have an omni-bearing indicator (OBI), a steam-gauge instrument, or a horizontal situation indicator (HSI), part of a glass-cockpit primary flight display (PFD).

In an OBI, the broken yellow arrow going across its face is called the course deviation indicator (or CDI). Each end of the CDI touches the directional gyro, which serves the same function as a compass. The yellow rectangles on the outside of the directional gyro are the glideslope indicators. The OBI has a knob in its lower left, called the omni-bearing selector (OBS). This knob is used to turn the CDI to point to a specific heading. For instance, if we were flying into runway 16L, we would know that it had a magnetic heading of about 160, to it would be a good idea to use the OBS to turn the CDI so that it points at 160 on the directional gyro. That way, when the airplane was directly on course, the CDI would be pointing straight up.

If instead your airplane has a glass cockpit, the functionality of the CDI is incorporated in your horizontal situation indicator (HSI) in your primary flight display. The course deviation indicator (CDI) portion of the HSI is represented by a vertical purple line. When it is in the center of the attitude indicator, it means that the aircraft is lined up almost perfectly with the physical centerline of the runway. The glideslope indicator portion of the HSI is represented by a horizontal purple line. When this is in the center of the instrument, the aircraft is perfectly in line with the glideslope.

Below the attitude indicator is the directional gyro. The directional gyro works like a compass in that it indicates the aircraft's heading. You can use this to line up your approach with a known heading (e.g., about 160 degrees for runway 16L.

7.5.4 Flying the Approach

Now that we've found the relevant ILS frequencies and set up the navigation instruments, let's begin flying the actual approach.

Once again, we're flying into Seattle-Tacoma International Airport (KSEA), the default airport in X-Plane 10, and we set ourselves up for a 10 nm final using a button in the Select Airport dialog. We have tuned our navigation radio, used the navigation source selector to choose the right radio, and we've set up the CDI or HSI.

As you're flying toward the airport, the CDI will begin to wander left or right to indicate which direction your airplane needs to move in order to point down the centerline of the runway. Aim *toward* the deflection to intercept the localizer course; when the CDI wanders right, point the aircraft's nose right, and so on.

Additionally, the glideslope indicator will begin to move. If its needles are above the center of the instrument then the craft needs to fly up, and if they are below the center of the instrument, it needs to fly down to intercept the glideslope. The goal is to keep the localizer CDI centered to stay on the localizer, and the glideslope CDI centered to stay on the glideslope.

Follow the guidance of the localizer and glideslope until the craft reaches an altitude of about 300 feet above the runway. At this point, if everything was done correctly, the runway will be right in front of the aircraft. If the landing itself was managed properly, the aircraft will be at its stalling speed plus 30% with the gear and flaps down as it comes in for a landing. In the Cirrus Vision, this is about 90 knots. In the Cessna 172, it's about 65 knots, and in the Boeing 747, it's about 140 knots.

Chapter 8

Special Situations in X-Plane

8.1 Using an Instructor Operator Station (IOS) for Flight Training

An Instructor Operator Station is a sort of console used by a flight instructor or someone standing in for an instructor. This console can be used to fail multitudes of aircraft systems, alter the weather and time of day, or relocate the aircraft. The IOS can be run either on the same computer as the simulator (using a second monitor), or it can be a separate computer which connects to the computer used as the simulator either via a local network or over the Internet.

Using one computer it is possible to draw whatever view of the aircraft or panel you wish in addition to an Instructor Operator Station (IOS), assuming your graphics card has two video outputs. To enable output of an IOS on your second monitor, open the Rendering Options from the Settings menu. There, check the "draw IOS on second monitor on same card" box (located in the Special Viewing Options portion of the window). A second window will appear displaying your view of your aircraft, and when you close the Rendering Options window, you will have a standard Local Map dialog box open in the other. Then, simply ensure the **IOS** box is checked in the upper right of the window and you will be ready to go. Use the button on the left to load different aircraft, relocate the aircraft, fail systems, and alter the weather for the "student" pilot.

Note that the mouse cannot be used to fly the aircraft when running an IOS on a second monitor.

Alternatively, to use a second computer as an IOS. To do so, launch X-Plane on both computers and open the Net Connections dialog box (found in the Settings menu). There, select the IOS tab. You need only tell the "master" machine (the one running the simulator, used by the student pilot) and the IOS how to "talk" to one another. On the master machine, check the box labeled **IP of single student instructor console (this is master machine)**. Then, enter the IP address of the computer used as the IOS. Correspondingly, on the computer used as an IOS, check the box labeled **IP of master machine (this is instructor console)** and enter the IP address of the student's computer.

In both cases, it should not be necessary to change the port number from 49000.

8.2 Flying Gliders

To fly a glider, such as the ASK 21 included with X-Plane 10, you will want to first be towed aloft by another aircraft. To do so, first load your glider as usual (using the Open Aircraft dialog box, found in the Aircraft menu, or using the Quick Flight Setup dialog, found in the File menu),

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Chapter 9

Expert Essays—Unleashingthe Simulator's Full Potential

9.1 Tuning the Handling of Aircraft X-Plane

If X-Plane is set up and flying, but aircraft seem to be too sensitive in pitch, or if they pull to one side, the simulator' s handling may need to be tuned.

Before performing the following, make sure the joystick and/or other control devices are set up and calibrated. See the section "Configuring Flight Controls" of Chapter 4 for instructions on doing this.

To easily see whether the controls are properly calibrated, go to the Settings menu and click Data Input & Output. There, select the rightmost of the check boxes labeled **joystick ail/elv/rud**. When you close the Data Input & Output dialog box, you will see, in the upper left corner of the screen, the aileron, elevator, and rudder inputs from the flight controls (such as a joystick, yoke, rudders, etc.).

With properly configured controls, the aileron, elevator, and rudder joystick inputs all read around 0.0 when your flight controls are centered. When the controls are pushed full left and forward, they should read around −1.0. When the controls are pulled full aft and right, they should read around 1.0. If this is what you see, then your controls are properly calibrated. If not, it' s no wonder the plane is not flying correctly! You need to configure the controls as described in the section "Configuring Flight Controls" of Chapter 4.

If the controls are indeed properly calibrated as per the above test, but the plane still is not flying correctly, it' s time to look at the first level of control response tuning. Go to the Settings menu and click Joystick & Equipment. In that dialog box, select the Axis tab. Leave the flight controls centered and hit the button labeled **Use this position as center**.

With that done, close the Joystick & Equipment dialog box and move the flight controls to the centered position. Check to see if the data output (which should still be on the screen from the pre-test in the above paragraphs) is around 0.000 when the controls are centered. If it is, then the hardware works fine and the center point was set successfully. If the data output does not read near 0, the hardware is either of poor quality (or failing) or the center point was not properly set.

With the center point set correctly, try flying the plane once again. If it still does not handle correctly, read on to tune the next level of control response.

Open the Joystick & Equipment window and select the Nullzone tab. Look at the three sliders labeled **control-response** (one each for pitch, roll, and yaw) in the upper right of the screen.

If these three sliders are fully left, then the control response is linear; that is, a 50% stick deflection in the hardware will give 50% control deflection in the aircraft. Likewise, 100% stick deflection in the hardware will give 100% control deflection in the aircraft.

If the problem being experienced is that the plane feels too responsive in the simulator, try dragging the sliders all the way to the right. This will give a non-linear response. Set this way, 0% hardware deflection will still give 0% control deflection in the simulator, and 100% hardware deflection will still give 100% control deflection. The difference lies in between—50% stick deflection in the hardware might only give 15% control deflection in the simulator. In other words, while the hard-over roll rate in the simulator will remain unchanged no matter how these sliders are set, fine control will be increased for smaller, partial deflections, since the flight controls will move less for a small-to-moderate stick deflection in the hardware joystick or yoke. This will give a nice, fine pitch control and slow, detailed roll control.

If, after changing the control response, the aircraft still does not fly as it should, read on.

The next level of control tuning is stability augmentation. If the plane still feels squirrelly or overly sensitive, go back to the Nullzone tab of the Joystick & Equipment window and try dragging the three sliders in the upper left of the window (labeled **stability augmentation**) all the way to the right.

This will cause X-Plane to automatically counteract any stick input to some degree, resisting rapid or large deflections in pitch, heading, and roll. Basically, it is like always having an autopilot on that smooths things out. This is obviously very fake, but in the absence of a perfect flight control system, g-load, and peripheral vision feedback, this can help smooth out the airplane's flight characteristics. Try flying with those sliders at various places, bearing in mind that full left should be most realistic (with no artificial stability added).

If, after doing all of the above, the aircraft still does not fly as it should, nothing more can be done within the simulator. It is now time to tweak the airplane model itself. In the real world, if a plane is pulling to one side or the other, a pilot will bend the little trim tab on the aileron one way or another. This bending of the aileron trim tab counteracts any imperfections in the shape of the airplane, the dynamics of the propwash, or the mass distribution inside the plane. The same thing can be done in X-Plane—you can bend a trim tab a bit one way or the other to make the plane fly true.

To do this, first exit X-Plane and open Plane Maker (found in the X-Plane installation folder, located by default on the Desktop). Go to the File menu and select Open. There, select the plane that is pulling left or right and load it using the **Open** button.

Then, go to the Standard menu and click Control Geometry. In this window, select the Trim & Speed tab. Look at the far right-hand column of controls in the top half of the screen, labeled trim tab adjust. This is a measure of how much the trim tabs are bent on each axis. The top control is the elevator, the middle the aileron, and the bottom the rudder (per the labels on the far left). A value of 0.000 in the **trim tab adjust** means that the trim tab is not bent at all. A value of 1.000 means the tab is bent so far that the control is fully deflected by the trim tab—this is way too far. Try bending the trim tab just a little bit—maybe set the value at 0.05 or at most 0.10. This would correspond to being enough force to deflect the controls 5% or 10%, respectively, due to the trim tab. A positive value corresponds to bending the trim tab up or right, depending on whether it is pitch, yaw, or roll. Thus, if the plane needs to roll right a bit more (or needs to stop rolling left), then enter a positive number for the aileron control. The same goes for the rudder: if the plane needs to pull right a bit more, enter a positive rudder trim tab adjust. If the plane needs to pull up a bit more, give it a positive elevator trim tab adjust. Tweak the trim tabs as needed, save the aircraft file (using Plane Maker's File menu), and exit Plane Maker. Then, open up X-Plane and try flying the plane again. It should noticeably pull one way or another based on how the trim tabs were bent. The trim tab controls may need to be tuned again to get the plane to fly as straight as is desired.

9.2 Setting Up a Copilot's Station

A copilot's station is a second computer networked to the main simulator, set to view a portion of the cockpit intended for the copilot. To use a copilot's station, you will first need two computers, each running their own copy of X-Plane. These need to be on the same network, or then need to be joined together with a single crossover Ethernet cable. The computers should form a simple LAN, configured as normal within Mac OS X or Windows, whatever the case may be.

You will need two copies of the aircraft file you intend to fly, both either created or modified using Plane Maker. The first copy of your aircraft should have the pilot-side instrument panel. If you are content with the default panel layout, any of the stock planes could be used.

With the first version (the pilot-side version) of the plane ready, simply make a copy of the entire airplane folder and add some suffix, such as "_copilot" to the end of the folder's name—for instance, if the aircraft you wanted to fly was in the folder "Boeing 747", you might name the copilot-side version "Boeing 747_copilot".

Next, open the copilot-side copy of the aircraft in Plane Maker and tweak the instrument panel (as described in the chapter "Creating an Instrument Panel" of the Plane Maker manual) as desired for the co-pilot's side of the craft. Save it when finished and close Plane Maker.

There should now be two copies of the same aircraft folder, where each aircraft file within has its own instrument panel. These folders should have names like "[*Plane name*]" and "[*Plane name*]_copilot". Both folders should be in the same place within your X-Plane directory.

Simply copy that entire aircraft folder from one of the computers over to the other, putting the aircraft folder in the same directory (relative to the X-Plane installation directory) on the second computer. For example, the folder location might be `X-Plane 10\Aircraft\Boeing 747\` on the pilot's computer and `X-Plane 10\Aircraft\Boeing 747_copilot\` on the copilot's computer.

With that done, open X-Plane on each computer, move the mouse to the top of the screen, click on the Settings menu, and select Net Connections. In the Net Connections dialog box, go to the "External Vis" tab. From here, the procedure for the pilot's and copilot's machines differ.

On the pilot's machine, check one of the boxes labeled **IP of extra visual/cockpit (this is master machine)** and enter the IP address of the copilot's machine.

Now, on the copilot's computer, check the box labeled **IP of master machine (this is extra cockpit)** and enter the IP address of the pilot's computer. In the lower left, click on the "folder name suffix" text box and enter "_copilot" (or whatever suffix you decided on previously). After that, no matter what aircraft is opened on the pilot's machine, this computer will add "_copilot" to the name of the aircraft folder that it needs to open.

Next, on the pilot's (and thus "master") computer, open the pilot version of the aircraft file you are using. If everything is set up correctly, the pilot's machine will send all the appropriate data to the copilot's machine, the copilot's machine will get the message. The copilot's machine will then apply the suffix "_copilot" to the name of the aircraft folder, and it will open the copilot's version of the aircraft cockpit on the copilot's machine.

9.3 Configuring a Multi-Monitor Simulator

There are a number of different ways in which a multi-display simulator can be used. You might want many displays linked together to form a super wide cockpit view, or you might want one display for your cockpit and others for external visuals.

There are two general ways of configuring multiple monitors. You can either have your monitors all connected to one computer, running one copy of X-Plane, or you can have multiple different computers all networked together, each one with its own monitor and its own copy of X-Plane.

In general, using multiple displays on one computer will be more restrictive regarding the ways in which you can configure the simulator. Networking many computers together will be more flexible, but it will also be much more expensive.

9.3.1 Driving Multiple Displays from One Computer

Multiple displays can be used with one computer in three ways. You can either:

- configure plug two monitors into your graphics card (if it supports multiple monitors) and configure the monitors as entirely separate in your operating system;
- purchase a video splitter like the Matrox TripleHead2Go, plug your monitors into that, and configure all your monitors as a single, super-large display in your operating system; or
- using a technology like AMD's Eyefinity (included with the Radeon 5xxx and later series video cards), plug your multiple monitors directly into your video card and configure them in the operating system like a single, super-large display.

If your multiple monitors are configured as a single large display in your operating system, all you need to do to have X-Plane fill the screen with a single large window is to check the **run at full screen** box in the Rendering Options dialog box. If, on the other hand, your monitors are configured in the operating system as separate displays, your best option is to have a regular, windowed version of X-Plane which you manually resize to fill as much of your display as possible. If you want to use your secondary monitor as an instructor operator station, refer to the section "Using an Instructor Operator Station (IOS) for Flight Training" of Chapter 8.

9.3.2 Networking Multiple Computers for Multiple Displays

To set up a multi-computer simulator, each of the computers you want to use must first be linked together over a network. X-Plane should then be launched on each computer. On each computer, open the Settings menu and click Net Connections. In this dialog box, select the "External Vis" tab. Here, the steps differ between the "master" machine (the computer which is hooked up to all your flight controls) and the other computers. On the master machine, you need to check as many of the **IP of extra visual/cockpit** boxes as you have extra computers, then enter the IP addresses of each of the other computers. On the computers used as other displays, however, you need only check one box labeled **IP of master machine** and enter the master machine's IP address. Note that in no case should you need to change the port number from 49,000.

How should these extra displays be configured? Let's assume we are to use four computers and four monitors: one cockpit and three external visuals (a common setup). On each of the three computers used for external visuals, we first need to open the Rendering Options dialog box from the Settings menu. There, we will enter a **lateral fteld of view** of 45° for each of them. Enter a **lateral offset for networked scenery** of 45° for the left screen, 0° for the center screen, and 45° for the right screen, with no vertical offset on all screens. This will simply yield a 135° (45 3) field of view. If this is drawn out on paper, it becomes apparent that the 45° offsets on the left and right screens will cause them to perfectly sync up with the center screen.

From there, the monitors need to physically be moved around the "cockpit" (that is, where a user will sit when flying the simulator) in a semi-circle describing a 135° field of view. If this is not done, then the horizon will not appear straight as the craft pitches and rolls, caused by the "fisheye lens" effect. If a 135° field of view is described in a flat plane or in an arc of monitors that describe less than 135° of arc, fisheye distortion will result, apparent as a horizon that seems to bend and distort between monitors.

9.3.2.1 Lining Up the Horizon (Without Vertical Offsets)

Now, sometimes people sit on the ground and see the horizon does not line up, so they enter vertical offsets on some of the display machines only in order to get the horizons to line up. They quickly become confused when everything breaks down as they pitch and especially roll. If vertical offsets are used, they must be used on all networked machines in your simulator, *unless you have one monitor physically above another*. If some but not all of your computers have vertical offsets, things start getting messed up. What often happens is that a user will fly with a cockpit in the center screen, which shifts the center of that screen *as far as scenery is concerned* to be around 75% of the way up the monitor; this is done in order to leave room for the instruments. The external visuals, on the other hand, have screen centers in the center of the monitor, since they do not have to reserve space for the instrument panel. In this case, you need to do the following:

1. Open Plane Maker from the X-Plane installation directory.
2. Click on the File menu, then click Open Aircraft.
3. Navigate to the aircraft you wish to fly and open it.
4. Click on the Standard menu, then click Viewpoint.
5. In the Viewpoint dialog box, go to the View tab.
6. Set the **view center Y, panel view** (i.e., the y coordinate of the center of the screen when in the panel view) to be one-half the height of your monitor in pixels (assuming you run X-Plane in full screen mode). For instance, if your monitor has a resolution of 1920 x 1080 pixels, you would enter 540 here (1080/2).
7. Close the Viewpoint dialog box, either by pressing Enter or by clicking an X in the corner of the window.
8. Open the File menu and click Save As (*not* Save, since you do not want to overwrite the original file).
9. Type in a name for this copy of the aircraft file (for instance, "Triple Monitor [*aircraft name*]") and press **Save**.
10. Close Plane Maker.

Now, when you load the new copy of the aircraft up in X-Plane, the screen center will be just where you like it.

9.3.2.2 Correcting for Monitor Bezels

Let's imagine that you have three networked computers for additional visuals to form a wrap-around cockpit. Each computer might have a 45° **lateral fteld of view** (as set in the Rendering Options). You would enter a **lateral offset for networked scenery** of 45° for the left visual, 0° for the front visual, and 45° for the right visual, as discussed above. If each display has a field of view of 45°, these images will blend together seamlessly *if* you don't consider the width of the displays' bezels (the frame around each monitor). If you cannot set up the monitors to run their effective image all the way to the edge (as you can with some, even though you wouldn't be able to see the part under the border), you might instead try a field of view of maybe 43° based on whatever fraction of the monitor is visible. Vertical and roll offsets, of course, are the up/down and tilt equivalents of the lateral offset.

Note: While the view offsets do indicate how much to the left or right or up or down each view is looking, people make the same mistake over and over: they run a center view with a cockpit in the center screen, and external visuals on the left and right—which is fine—but they notice that the horizon in the center (cockpit) screen does not line up with the horizons on either side. The reason for this is that the center-point of the screen where the horizon rests in a level flight attitude is up near the top of the screen in the cockpit view (to make room for the instrument panel) and the center of the screen for the external visuals (which do not need room at the bottom for the instrument panel). Often, people will incorrectly lower the vertical offset of the center panel (with the cockpit).

This results in countless problems with the views not lining up. The way to correct this is to do as in the "Lining Up the Horizon (Without Vertical Offsets)" section above and change the screen center for your aircraft; only then will the horizon always line up across all the visuals. In other words, the only time a vertical offset should be used is if there is one monitor on top of another.

9.3.2.3 Using Other Special Viewing Controls

The **lateral fteld of view** setting, located in the Rendering Options window, will change the way X-Plane displays the view of the outside world. Higher settings will allow more of the terrain to be viewed at any one time, but will reduce performance. Higher settings will also increase the "fish eye" effect of the simulator. The default value is 45° per display, which generally gives good performance and a natural view. Note, of course, that changing the field of view of a monitor in a multi-display setup will require you to re-evaluate your **lateral offset** values as well.

Now, suppose you are using multiple monitors, some for external visuals and others for cockpit displays. You may notice that when views are changed within X-Plane, the change propagates to *all* the visuals. To stop this from occurring, you can select the radio button labeled **lock to panel view** near the bottom right of the Rendering Options dialog box. Selecting this will cause the display to always show the forward-with-cockpit view.

VOLUME 2 AIRCRAFT OPERATIONS

2.1 GENERAL

2.1.1 DOCUMENTS TO BE CARRIED ON FLIGHTS

The following documents and manuals must be carried in the aircraft during all training flights:

- valid maintenance release
- flight crew licences and medical certificates
- aircraft flight manual (AFM) and supplements (if applicable)
- Advanced Aviation Training aircraft checklists (normal and emergency) – see form 4B14
- aircraft journey log – see form 4B15
- a map of the training area (if required).

Instructors must ensure that for any navigation exercise, weather forecasts and NOTAMs for the route are carried, along with all applicable maps and aeronautical information publication (AIP) documentation and a completed weight and balance (W&B) calculation.

2.1.2 AIRCRAFT FLIGHT MANUAL (AFM) AND USE OF CHECKLISTS

The aircraft flight manual (AFM) is integral to the certification of the airworthiness of an aircraft, and contains information and instructions required to operate the aircraft safely. The HOO must ensure each aircraft operated has a current AFM.

Aircraft are to be operated IAW the Advanced Aviation Training aircraft checklists (normal and emergency) that are derived from the manufacturers documentation. The procedures and limitations contained in the AFM for the aircraft will apply where these checklists do not cover a situation.

Checklist actions by memory must only be conducted in emergency situations; in all other cases the company checklists must be used.

2.1.3 CARRIAGE OF PASSENGERS IN SEATS AT WHICH DUAL CONTROLS ARE FITTED

If a passenger has to occupy a seat where functioning flight controls are fitted, that person may only do so after being specially briefed by the PIC.

2.1.4 CARRIAGE OF EXAMINERS AND CASA INSPECTORS

CASA Flying Operations Inspectors (FOIs) may be carried in aircraft for the purposes of checking company instructors or observation of flight tasks, when authorised by the HOO. It is company policy that a company pilot must always be the nominated PIC unless the FOI is conducting a proficiency check or rating issue on company personnel as a flight examiner.

2.1.5 MANIPULATION OF PROPELLER - HAND STARTING OF ENGINES

Warning: The propeller should always be treated as 'live'.

If hand starting of an aeroplane is a standard operating procedure, it must be carried out under the supervision of an instructor and IAW the AFM for the aircraft.

2.1.6 TAXIING

Persons authorised to taxi aeroplanes operated by Advanced Aviation Training include:

- student pilots who have completed their first solo flight
- pilots who hold an aircraft class rating for that aeroplane
- persons holding a Part 64 authorisation to taxi an aeroplane

2.1.7 USE OF SEATBELTS

All occupants of aircraft operated by Advanced Aviation Training must have seat belts or safety harnesses fastened at all times during flight.

2.1.8 CARRIAGE OF LIFEJACKETS

For any anticipated flights over water, the PIC will ensure that there are sufficient life jackets for all occupants on board the aircraft.

2.1.9 MINIMUM EMERGENCY EQUIPMENT TO BE CARRIED

All aircraft operated by Advanced Aviation Training are equipped with approved emergency locator transmitters (ELTs). If an ELT is not serviceable, the company has one portable ELT which will be carried on board for cross country flights.

2.1.10 WEIGHT AND BALANCE CONTROL

The PIC is responsible for ensuring that the aircraft is loaded IAW the procedures contained in the relevant AFM and that no limits are exceeded during the flight.

A full weight and balance calculation must be completed by the PIC before each navigation exercise. The record of the calculation forms part of the pre-flight authorisation documentation.

2.1.11 SECURING AIRCRAFT

The PIC must ensure that the aeroplane is secured whenever it's left unattended to prevent damage by means such as:

- throttle locks
- locking all control surfaces
- park brake is set on
- doors are locked

- the aeroplane is securely chocked, pitot covers fitted and tie down restraints attached.

***Note**: If the aeroplane is left in an enclosed hangar, the park brake may be left off, providing the aeroplane is securely chocked.*

2.1.12 PASSENGER BRIEFINGS

All passengers must be briefed before take-off by the PIC IAW Advanced Aviation Training checklists.

2.1.13 PERSONAL ELECTRONIC DEVICES

A student is not permitted to use the navigation function on a personal electronic device on a training flight except in an emergency.

2.1.14 FUEL POLICY

2.1.14.1 PURPOSE

This section covers the fuel policy and planning requirements to be followed when conducting authorised Part 141 flight training operations in aircraft operated by Advanced Aviation Training.

2.1.14.2 MINIMUM FUEL PLANNING REQUIREMENTS

At the start of a flight, our PIC always ensure that the fuel quantity carried includes the following (calculated using the relevant fuel flow rates stated in section 2.1.14.3):

1. taxi fuel they expect to use before take-off, taking into account local conditions at the departure aerodrome and auxiliary power unit consumption (if applicable). See tables in 2.1.14.3 below for taxi allowances and section 2.1.14.2.1 for operating conditions
2. the trip fuel required to enable the aircraft to fly until landing at the destination aerodrome, taking into account the operating conditions. See cruise fuel flow rates in tables in 2.1.14.3 below and considerations listed in 2.1.14.2.1, including (as applicable):
   A. fuel for take-off and climb from departure aerodrome elevation to initial cruising level/altitude, taking into account the expected departure routing
   B. fuel for cruise from top of climb to top of descent, including any step climb or descent from the initial cruising level/altitude mentioned in paragraph (a) above
   C. fuel from top of the descent to the point where the approach is initiated, taking into account the expected arrival procedure
   D. fuel for executing an approach and landing at the destination aerodrome.
3. alternate fuel (if required) to enable an aircraft to do the following in a sequence, using cruise fuel flow rates listed in tables 2.1.14.3 and considering operating conditions in section 2.1.14.2.1:
   A. a missed approach at the destination aerodrome
   B. fly the expected routing to the destination alternate
   C. conduct the approach
   D. land at the destination alternate.
4. a fuel fixed reserve covering the amount of fuel:
   A. required to fly at 1,500 feet above aerodrome elevation in ISA conditions for the period of time specified below:
      i. Small aeroplanes (< 5700kg) – 30 minutes for day-VFR at the holding rate
      ii. Small aeroplanes (< 5700kg) – 45 minutes for IFR or night-VFR at the holding rate.
      iii. All turbojets or large (> 5700kg) turboprop aeroplanes – 30 minutes at the holding rate
      iv. Large piston aeroplanes (> 5700kg) – 45 minutes at the holding rate
   B. calculated with the estimated weight on arrival at the destination alternate (or the destination aerodrome when no destination alternate is required)
   C. which is usable fuel remaining in the fuel tanks until completion of the final landing.
5. additional fuel (if required – multi-engine operations or pressurized aircraft) which is the supplementary amount of fuel required to allow the aircraft, in the event of engine failure or loss of pressurization, whichever results in the greater subsequent fuel consumption, occurs at the most critical point. See section 2.1.14.3 one engine fuel flow rate and depressurized fuel flow rate and section 2.1.14.2.1 operating conditions:
   A. to proceed to an alternate aerodrome
   B. to fly for 15 minutes at holding speed at 1,500 feet above aerodrome elevation in ISA

conditions

C. to make an approach and landing.

6. holding fuel (if required) covering the amount of fuel required to fly for the period of time anticipated to be required for holding (taking into account the operating conditions) calculated at the holding fuel consumption rate established for the aircraft for the anticipated meteorological conditions or ISA, using holding fuel rates listed in tables 2.1.14.3 and considering operating conditions in section 2.1.14.2.1
7. variable fuel (only if the aircraft operated is turbojet, large aeroplane [turboprop or piston]) – 5% of the trip fuel for the flight
8. fuel required is the sum of numbers (1) to (7) above
9. discretionary fuel in accordance with section 2.1.14.4 below
10. fuel margin which is the difference between fuel required (item 8), discretionary fuel (item 9) and endurance (item 11) of this section
11. endurance (the sum of items 8, 9 and 10) of this section.

2.1.14.2.1 FUEL OPERATING CONDITIONS

Due to the fact there are many variables pertaining to operational conditions that influence the determination of usable fuel for a flight, Advanced Aviation Training takes into account the following items:

1. anticipated aircraft weight
2. NOTAMS
3. meteorological reports and forecasts
4. ATC procedures, restrictions and anticipated delays
5. the effects of any deferred maintenance items and configuration deviations [if applicable]
6. the potential for deviations from the planned flight because of unforeseen factors

2.1.14.3 FUEL FLOW RATES

Advanced Aviation Training operates the following aircraft, and fuel flow rates are as follows.

Vans RV-6

Activity	**Fuel flow rate**
Allowance for taxi, departure and arrival	8 litres
Cruise fuel flow rate	32 litres per hour
Holding fuel flow rate	32 litres per hour

Vans RV12iS

Activity	**Fuel flow rate**
Allowance for taxi, departure and arrival	4 litres
Cruise fuel flow rate	20 litres per hour
Holding fuel flow rate	14 litres per hour

Vans RV14

Activity	Fuel flow rate
Allowance for taxi, departure and arrival	8 litres
Cruise fuel flow rate	38 litres per hour
Holding fuel flow rate	34 litres per hour

Vans RV10 I0-540

Activity	Fuel flow rate
Allowance for taxi, departure and arrival	12 litres
Cruise fuel flow rate	45 litres per hour
Holding fuel flow rate	45 litres per hour

Cessna 172RG

Activity	Fuel flow rate
Allowance for taxi, departure and arrival	10 litres
Cruise fuel flow rate	38 litres per hour
Holding fuel flow rate	38 litres per hour

Sirrus SR-20

Activity	Fuel flow rate
Allowance for taxi, departure and arrival	12 litres
Cruise fuel flow rate	45 litres per hour
Holding fuel flow rate	45 litres per hour

Cessna 150 / 152

Activity	Fuel flow rate
Allowance for taxi, departure and arrival	4 litres
Cruise fuel flow rate	24 litres per hour
Holding fuel flow rate	24 litres per hour

2.1.14.4 DISCRETIONARY FUEL FOR SOLO TRAINING FLIGHTS

Instructors working for Advanced Aviation Training always ensure that, in addition to the fuel required to safely conduct the flight (including any prescribed fuel reserves), a suitable amount of discretionary fuel is carried on all solo training flights. This amount is based on normal cruise fuel flow rates and is currently set at:

1. 45 minutes for training area flights
2. 60 minutes for cross country navigation flights.

These amounts are revised from time-to-time in the light of experience 2.1.14.7, as required by the HOO and are promulgated to staff and students via a Manual amendment.

2.1.14.5 FUEL RELATED PROCEDURES

2.1.14.5.1 DETERMINING AND RECORDING FUEL QUANTITY - PRE-FLIGHT

The pilot in command ensures that a determination of the quantity of usable fuel on board is conducted before flight. Fuel quantity gauge readings are cross checked to ensure accurate fuel calculations against one of the following methods:

- Visual confirmation - full, tabs or dipstick reading
- Calculated - comparing fuel on board from previous flight with fuel added with reference to aircraft journey log Form 4B15

Any *significant* fuel quantity discrepancy between actual fuel on-board (gauge) and calculated (journey log) is reported to a qualified licenced aircraft maintenance engineer for further investigation.

If there is a need to defuel prior to flight, then this is carried out by an appropriately approved and qualified person and in the appropriate location as outlined in section 2.1.14.8 here.

2.1.14.5.2 DETERMINING AND RECORDING FUEL QUANTITY - IN-FLIGHT

During all flights, at a 30-minute interval, our pilots conduct a fuel quantity check whereby the usable fuel remaining is evaluated to compare planned fuel consumption with actual fuel consumption. This is accomplished by cross-referencing the fuel remaining on gauges with an appropriately calculated fuel log covering aircraft endurance – litres and minutes of fuel remaining. Our pilots determine the expected usable fuel remaining on arrival at the destination aerodrome and whether the usable fuel remaining is sufficient to complete the planned flight.

Upon conducting this cross-reference, if there is an unexplained discrepancy between the fuel gauge reading and the fuel log of more than [*operator to specify maximum tolerance in minutes and/or litres]*, the pilot in command takes into consideration the items in section 2.1.14.5.2.1 below.

2.1.14.5.2.1 In-flight fuel procedures

If, after flight commencement, fuel is used for a purpose other than that originally intended during pre-flight planning, the pilot in command reanalyses and, if applicable, adjusts the planned flight.

If it is determined that the usable fuel expected to be remaining on arrival at the destination aerodrome is less than the fixed fuel reserve (where no alternate aerodrome is required), then the pilot takes appropriate action and proceeds to an en-route alternate so as to perform a safe landing with not less than the fixed fuel reserve remaining.

If it is determined that the usable fuel expected to be remaining on arrival at the destination aerodrome is less than the fixed fuel reserve plus alternate fuel (if applicable), the pilot in command considers the traffic and the operational conditions prevailing at the destination aerodrome, at the destination alternate and at any other en-route alternate, and, if insufficient fuel is available to account for the traffic or operational conditions at the destination aerodrome, then the pilot in command ensures a safe landing can be made at the destination alternate or an en-route alternate with not less than fixed fuel reserve remaining.

If the pilot decides to proceed to an en-route alternate from a decision point, the amount of usable fuel on board includes:

1. trip fuel from the decision point

2. holding fuel (as required)
3. variable fuel reserve (if specified in Table 1 in CASA 29/18 Instrument)
4. alternate fuel (if required)
5. fixed fuel reserve
6. additional fuel (if applicable)

At any time during flight, the amount of usable fuel on board to continue a flight safely includes:

1. trip fuel from that time
2. holding fuel (as required)
3. alternate fuel (if required)
4. fixed fuel reserve
5. additional fuel (if applicable).

The pilot requests delay information from ATC when unforeseen factors may result in landing at the destination aerodrome with less than the following:

1. if alternate fuel is required — alternate fuel plus fixed fuel reserve
2. if alternate fuel is not required — fixed fuel reserve.

The pilot in command has been instructed to advise the ATC of a minimal fuel state that when, having committed to land at a specific aerodrome, the pilot calculates that any change to the existing clearance to that aerodrome may result in landing with less than the fixed fuel reserve for the flight. This will be broadcast as "MINIMUM FUEL".

The pilot in command has been instructed to declare a situation of emergency fuel when the calculated usable fuel predicted to be available upon landing at the nearest aerodrome where a safe landing can be made is less than the fixed fuel reserve for the flight. The pilot in command has been instructed to declare an emergency fuel state by broadcasting "MAYDAY, MAYDAY, MAYDAY FUEL".

2.1.14.5.2.2 Considerations at point of inflight decision-making and/or decision point

Should the need arise to make an inflight decision whether a landing can be made at the destination or any available en-route alternate, the following is taken into account:

- meteorological conditions, both en-route and at the destination, to include hazardous phenomena such as thunderstorms, turbulence, icing and restrictions to visibility
- field conditions, such as runway condition and availability and status of navigation aids
- en-route navigation systems and facilities status, where possible failures could affect the safe continuation or completion of the flight
- en-route fuel supply, including actual en-route consumption compared to planned consumption, as well as the impact of any changes of alternate airport or additional en-route delays
- airborne equipment that becomes inoperative, which results in an increased fuel consumption or a performance or operational decrement that could affect the flight crew's ability to make a safe landing at an approved airport
- air traffic management concerns, such as re-routes, altitude or speed restrictions and facilities or system failures or delays
- security concerns that could affect the routing of the flight or its airport of intended landing

The following equi-time point (ETP) and point of no return (PNR) calculation is used to assist pilots in making inflight decisions.

2.1.14.5.2.3 Equi-time point (ETP) selection and calculation

Advanced Aviation Training calculates its ETP for each aircraft type and each flight using the equation cited below. The selection of aerodromes on which Advanced Aviation Training ETP calculation is based takes into consideration the characteristics of the route being flown. For long distance routes between suitable en-route alternate aerodromes (ERA), such as in oceanic or remote areas, the planned route of flight is usually examined to identify suitable ERAs based on aircraft requirements, aerodrome capability, and weather.

The ETP formula or equation that Advanced Aviation Training uses normally returns the distance along track to the ETP from the departure point with input values of total distance, groundspeed back and groundspeed forward, as shown below:

Ground Distance to ETP equals:

(Total Distance X Ground Speed Back) ÷ (Ground Speed Back + Ground Speed Forward) = Nm

2.1.14.5.2.4 Point of no return (PNR) selection and calculation

Advanced Aviation Training calculates its PNR for each aircraft type and each flight using the equation cited below.

While the PNR is usually calculated and specified in the operational flight plan (OFP), such a calculation does not typically take into account any discretionary fuel, or the real-time changes in fuel consumption that may occur after departure. Therefore, the actual PNR for Advanced Aviation Training flights will sometimes be reached later in that specific flight than the point originally calculated in the previously calculated OFP.

The equation Advanced Aviation Training uses when calculating time to a PNR is:

Time to PNR equals:

(Safe Endurance X Ground Speed Back) ÷ (Ground Speed Back + Ground Speed Forward)

Where safe endurance is:

(Total Fuel Quantity - Required Fuel Reserves) ÷ (Average Fuel Consumption Rate)

Note: When calculating time to PNR, the units (hours or minutes) for endurance and groundspeed must be consistent.

The equation for calculating ground distance to a PNR is:

Ground Distance to PNR equals:

(Safe Endurance X Ground Speed Back X Ground Speed Forward) ÷ (Ground Speed Back + Ground Speed Forward)

2.1.14.5.3 DETERMINING AND MONITORING FUEL QUANTITY - POST FLIGHT

Upon returning from a flight, pilots are required to complete all relevant fuel documentation including the journey log [Form 4B15] with the amount of fuel at shut-down. Any *significant* fuel quantity discrepancy variation between actual fuel on-board (gauge) and completed journey log is reported to a qualified licenced aircraft maintenance engineer for further investigation.

2.1.14.6 FUEL TYPES

All aircraft operated by Advanced Aviation Training use:

- AVGAS 100 (Green colour - also known as AVGAS 100/130) or
- AVGAS 100LL (Blue colour)
- ULP Premium (Rotax engines)

No other type or grade of fuel is to be used.

2.1.14.7 FUEL USAGE MONITORING

The HOO at Advanced Aviation Training monitors fuel usage by dividing monthly total fuel usage by monthly total Tacho time to arrive at an average fuel rate per aircraft. If there is a significant variance from previous figures, the HOO investigates the cause. If a leak or a faulty fuel gauge is suspected, maintenance action is initiated. Should the cause be of a more long-term nature, the HOO amends the planned fuel rates specified in section 2.1.14.3.

2.1.14.8 AIRCRAFT REFUELLING

All aircraft operated by Advanced Aviation Training are refuelled from a bowser or refuelling truck using the following procedure:

1. ensure the following safety precautions, external to an aircraft, are present prior to commencing fuelling operations
   A. ensure the area is clearly placarded as 'no-smoking' and the limits of this area shall be a sealed building or at least 15 metres (50ft) from the aircraft of ground refuelling equipment
   B. ensure no persons are smoking or using a naked flame within 15 metres (50ft) of the aircraft and ground fuelling equipment
   C. except in the case of aircraft, operate an internal combustion engine or any electrical switch, battery, generator, motor or other electrical apparatus within 15 metres (50ft) of the aircraft's fuel tank filling points or vent outlets, and ground fuelling equipment unless the engine, switch, generator, motor or apparatus complies with the provisions in Appendix of the Civil Aviation Order 20.9.
2. Ensure there are no persons on-board the aircraft
3. Position the aircraft to allow easy movement if there is an emergency. This also applies to mobile fuelling equipment if used
   A. during fuelling operations, the aircraft and ground fuelling equipment are located so that no fuel tank filling points or vent outlets lie:
      i. within 5 metres (17ft) of any sealed building
      ii. within 6 metres (20ft) of other stationary aircraft
      iii. within 15 metres (50ft) of any exposed public area
      iv. within 9 metres (30ft) of any sealed building in the case of aircraft with a maximum take-off weight not exceeding 5,700 kg (12,566 lb).
   B. refulling or defueling is not conducted in a hangar
   C. at least 2 fire extinuishers of approved type and capacity are positioned:
      i. within 15 meters, but not less than 6 meters from the aircraft and the fuelling equipment, or
      ii. carried on the fuelling equipment
4. Secure static leads
5. Remove tank cap
6. Refuel aircraft
7. Secure tank caps
8. Remove static leads
9. Complete required documentation - All fuel added is recorded in the aircraft journey log

[Form 4B15] and then updated on the flight authorisation sheet in the ops room at the completion of the flight [Form 4B9].

NOTE: If no means other than refuelling from a drum is available, the HOO approves the procedure.

2.1.14.8.1 ACTION IN THE EVENT OF A FIRE HAZARD

In the event of a spill or a fire hazard, Advanced Aviation Training follows the following procedures:

1. a fuelling operation is stopped, and the appropriate airport fire service is notified when any fuel of a quantity likely to create a fire hazard is spilled within 15 metres (50ft) of the aircraft or ground refuelling equipment and does not recommence until the fire has been removed
2. mobile power units, vehicles and power operated loading devices operating within 15 metres (50ft) of the spilled fuel are shut down
3. maintenance work of any nature on or within the aircraft are suspended and not recommenced until the spilled fuel has been removed
4. if fuel is spilled, the HOO is immediately notified to obtain a fuel spill kit, follow their order in relation to the spill, and when time permits, fill in a hazard and incident report form.

2.1.14.9 REFUELLING BY STUDENTS

Only students who have completed the following are permitted to conduct unsupervised refuelling:

- successfully completed refuelling training
- been assessed as competent in unit C4 of the PART 61 MOS
- have written approval to conduct unsupervised refuelling entered into their training records by their usual instructor or the HOO

2.1.14.10 FUEL QUALITY CHECK

Before the first flight of the day and after refuelling, the PIC carries out a fuel drain check.

The fuel quality check is to confirm:

- the absence of water or contamination
- the grade and type of fuel.

If a small quantity of water is detected, the fuel is drained until all traces are removed from the fuel system before starting engines.

When significant quantities of contamination are found, this is:

- endorsed on the maintenance release
- reported to the Operations Officer for aircraft reallocation
- reported to the HOO.

2.1.14.11 ENGINE OIL AND HYDRAULIC FLUID MANAGEMENT

Only oil and hydraulic fluid of the type specified in the AFM or manufacturers approved data as detailed on the maintenance release for a particular aircraft may be added to that aircraft's engine. Oil and hydraulic fluid quantities will be in IAW the manufacturer’s or AFM requirements.

Oil is carried on all navigation exercises. At intermediate landing points, if there is enough time on the ground, the oil quantity is checked and topped up if and as required. Any oil added is recorded on the maintenance release.

Oil consumption that exceeds the manufacturer’s requirements is brought to the attention of the HOO and the maintenance organisation responsible for the maintenance of the aircraft.

Should there be a need to add hydraulic fluid, Advanced Aviation Training requires liaison with a licenced aircraft maintenance engineer before doing so.

2.2 AIRCRAFT AIRWORTHINESS

2.2.1 SYSTEM OF MAINTENANCE

The log book statement details how the aircraft should be maintained. The maintenance release details what schedule was used in order to issue the maintenance release and control the maintenance in its period of validity.

2.2.2 SCHEDULING OF MAINTENANCE

The HOO or delegate shall review maintenance releases on a daily basis for upcoming routine maintenance items and any entries regarding unserviceabilities made during operations. The HOO or delegate shall liaise with the maintenance provider to action any outstanding maintenance items or rectify reported defects.

Before releasing the aircraft for flying operations, the HOO or delegate shall verify that any maintenance release entry has been appropriately cleared as applicable.

2.2.3 MAINTENANCE RELEASE PROCEDURES

Advanced Aviation Training uses a standard CASA maintenance release form. This is used for:

1. Notification if maintenance is required to be performed during the period of validity of the MR (Part1)
2. Recording defects or damage to the aircraft (Part 2)
3. Recording flight time (Part 3)
4. Certifications for the conduct of the daily inspection (Part 3)

Before a flight the PIC must check the MR to ensure;

1. The date and/or the total time in service (TTIS) when the MR expires will not be exceeded during the intended flight (Part 1)
2. The date and/or any total time in service of any maintenance required to be performed will not be exceeded during the intended flight (Part 1)
3. Any defects or damage listed on Part 2 that are required by aircraft certification or are items that may affect the aircrafts airworthiness are rectified prior to the intended flight
4. Any equipment listed as unserviceable in Part 2 is not required for the intended flight or is specified as mandatory equipment in the aircraft flight manual
5. The daily inspection has been certified correctly in Part 3 of the MR showing the date, signature and flight crew licence number of the person who performed the inspection.

The MR must be carried on all flights.

Persons conducting the daily inspection must do so in accordance with the appropriate schedule. Part 1 of the MR will specify the schedule/system of maintenance to which the aircraft is being maintained. The daily inspection for company aircraft maintained to the CASA maintenance schedule is found in Schedule 5 of the Civil Aviation Regulations. If Part 1 of the MR specifies a maintenance schedule other than schedule 5 (i.e. manufacturers schedule or system of maintenance) then the person conducting the daily inspection must have a copy of that inspection at hand prior to conducting the daily inspection.

Pilots are reminded of their responsibilities in recording any defect on the MR IAW *CAR 50 (2)*.

If an endorsement on Part 2 of the MR is a major defect or major damage, the MR becomes invalid until such time as the major defect or damage is rectified and the endorsement cleared by an appropriately authorised or licenced person.

Defects that are not major defects or damage may not render the MR invalid. The PIC will assess whether any such defect is in an item of equipment that is required for the particular flight. For example, if a night flight is planned and instrument lighting is unserviceable, the flight must not be commenced until the lighting is rectified. However a day VFR flight would not be affected. Some defects may render the aircraft unserviceable as the component or equipment is required by type certification. Where the PIC is unsure, the matter should be referred to the HOO for consultation with the maintenance provider or suitably qualified maintenance engineer. A student acting as PIC is to consult with an Instructor as to the status of a defect under any of these circumstances.

On completion of each flight, the PIC must record the flight time and number of landings for the flight, in the journey log for the aircraft.

On completion of flying operations each day, an instructor nominated by the HOO is to calculate the time in service for the day for each aircraft flown, and record the daily time in service and total time in service on the maintenance release. Oil uplift and number of daily landings are also to be recorded on the maintenance release.

2.2.4 MAJOR DEFECTS

A major defect means damage of a kind that may affect the safety of the aircraft (*CASR Part 1 - Definitions*). The HOO or their delegate must ensure all major defects are investigated and reported to CASA by submission of a Service Difficulty report (CASA form 404 or online).

The raising of a Service Difficulty report is the responsibility of the registered operator of the aircraft.

2.2.5 CORRECTIVE ACTION PROCEDURES

Any doubts concerning the airworthiness of an aircraft must be initially referred to the HOO or the supervising instructor.

Aircraft may be flown with an existing defect by use of a permissible unserviceability (PUS) or the approval of a ferry flight by the issue of a special flight permit. The HOO or delegate is to liaise with the maintenance provider to apply for permissions from CASA or a CASA delegate. Permissions must be endorsed on the aircraft maintenance release.

2.2.6 PILOT MAINTENANCE

A flight instructor may carry out maintenance provided:

- they have been approved by the HOO as specified in CAR Schedule 8
- There is approved data and tooling available to the instructor
- Any parts fitted have been stored, tracked and their installation recorded in an appropriate recording system
- they are trained in the tasks required

Maintenance other than a daily inspection must be certified on Part 2 of the maintenance release. Induction training for flight instructors may also include maintenance certification requirements.

2.2.7 LIGHTNING STRIKE

If a lightning strike is experienced in flight:

1. The PICs must report it on Part 2 of the aircraft maintenance release.
2. The PICs must report the event to the HOO.
3. The HOO must report it to the maintenance organisation for investigation.

2.2.8 BIRD OR ANIMAL STRIKE

If a bird or animal strike is experienced in flight:

1. The PICs must report it on Part 2 of the maintenance release.
2. The PICs must report the event to the HOO.
3. The HOO must inform the maintenance organisation for investigation.

If the strike took place at a registered aerodrome, the PIC must report the event to the ATSB within 72 hours.

2.2.9 PROCEDURE IF AN AIRCRAFT BECOMES UNSERVICEABLE AWAY FROM HOME BASE

An instructor is permitted to rectify and certify for the rectification of an unserviceability that is listed in CAR Schedule 8 provided:

- the instructor is trained and approved for such maintenance
- the HOO has approved the rectification.

If *CAR Schedule 8* is not applicable, the instructor must liaise with the HOO to establish if suitable maintenance resources are available locally.

If local resources are not available, the HOO will make arrangements to secure and protect the aircraft and arrange recovery.

VOLUME 3 PART 141 FLIGHT TRAINING

3.1 INSTRUCTOR TRAINING

3.1.1 INSTRUCTOR INDUCTION TRAINING

3.1.1.1 POLICY

Induction training is to be completed by all instructors prior to commencing flight training activities.

The HOO is responsible for planning, scheduling, conducting and recording the results of the training in the instructor's individual file.

3.1.1.2 TRAINING COURSES

Instructor induction training will consist of two courses - IT1 and IT2.

1. IT1 is general company induction training.
2. IT2 is human factors principles and non-technical skills (HF/NTS) training.

The training is to ensure all newly recruited instructors are equipped with the knowledge to safely and effectively discharge their duties and responsibilities for Advanced Aviation Training.

3.1.1.2.1 IT1 TRAINING

The new instructor will carry out directed study on the topics outlined in the Instructor Induction Training Course IT1 at form 4B05. The HOO will brief the instructor and carry out practical instruction as required IAW the course topics and ensure adequate knowledge has been acquired.

3.1.1.2.2 IT2 TRAINING

IT2 training is designed to induct the new instructor into the company's HF and NTS program IAW section 3.3.

3.2 INSTRUCTOR STANDARDISATION AND PROFICIENCY CHECKS

3.2.1 CONDUCT

An instructor must complete a standardisation and proficiency (S&P) check before starting flight training activities. Recurrent S&P checks must be completed IAW *CASR 141.190*.

S&P checks will be conducted by the HOO. The checks will include a review of the instructor's competency to deliver sample long and pre-flight briefings and flight instruction IAW the syllabus and lesson plans published in this Operations Manual.

The HOO will give sufficient advance notice of the topic to be assessed during the check. During delivery of briefings and flight demonstrations, the HOO will assume the role of a student-under-instruction. The HOO will be PIC for the in-flight component of the check and will brief the instructor on contingencies during a real emergency.

The minimum competency standards in the briefing are the standards as described the *Part 61 MOS unit FIR 1 (Conduct aeronautical knowledge training)*. The minimum competency standards in flight instruction are the standards described in unit FIR 3 (conduct flight training). The results will be recorded on form 4B07 and record the new expiry date on form 4B10.

For the initial S&P check, the HOO will record the results on form 4B03.

3.2.2 DEBRIEFING

The HOO will advise the instructor of the overall result of the check. Any deficiencies are to be recorded with a corrective plan on the instructors file. Should the instructor be deemed to be 'not yet competent' (NYC), the HOO will arrange a remedial training program to ensure competency before they recommence training duties.

If an instructor has demonstrated marginal performance, the HOO may require a further standardisation and proficiency check to be completed following the completion of remedial training.

3.3 HUMAN FACTORS AND NON-TECHNICAL SKILLS PROGRAM

3.3.1 OVERVIEW

The objective of internal training in human factors principles and non-technical skills (HF/NTS) is to provide instructors with an understanding of how and why errors may occur during training, the risk these errors represent and what can be done to manage the risk.

This knowledge can then be applied to minimise the potential for future errors and improve flight safety.

The internal training conducted by Advanced Aviation Training is aimed at providing instructors with basic level of human factors knowledge and non-technical skills and maintaining the knowledge and skills over time.

Advanced Aviation Training has utilised the *Safety Behaviours: Human factors for pilots* (SB:***HF for pilots***) kit produced by CASA as a resource for developing the HF/NTS internal training syllabus at section 4.1.3.

3.3.2 INDUCTION TRAINING

The induction training Course (IT2) is comprised of the following:

1. The HOO will choose three module C topics from the syllabus
2. The instructor will pre-read the corresponding chapters from the *CASA SB:HF for pilots - Resource Guide*
3. Where applicable the instructor will watch the *SB:HF for pilots - Introduction and Airtime drama video*
4. The instructor will complete the exercises that correspond to the selected chapters
5. The HOO will review the completed exercises and discuss with the instructor to ensure adequate awareness of the subjects has been achieved.

3.3.3 REFRESHER PROGRAM

The Company's refresher HF/NTS training will be conducted on an annual basis coinciding with the instructor's Standardisation and Proficiency check. The syllabus sets out topics which may be chosen and is designed to cycle through on a 3-year basis.

The refresher training course will include the following tasks:

1. The HOO will choose 4 module C topics from the syllabus
2. The instructor will pre-read the corresponding chapters from the SB:HF for pilots – Resource Guide
3. Where applicable the instructor will watch the SB:HF for pilots - Introduction and Airtime drama video
4. The instructor will complete the exercises that correspond to the selected chapters
5. The instructor will plan three HF related hazards that could exist in their operations or similar operations and consider ways for managing the risk (corresponding to section 4.1.3 topic in the sample syllabus below).

The HOO will review the completed exercises and discuss these and the instructor's consideration of the three HF hazards with the instructor to ensure adequate awareness of the subjects has been achieved.

3.3.4 SYLLABUS

A syllabus is provided at Appendix 4.1.3 and covers the following major topics included in the CASA *SB: HF for pilots toolkit*:

- fatigue
- stress
- alcohol and other drugs (AOD)
- communication
- teamwork
- leadership
- situational awareness
- decision making
- threat and error management
- airmanship.

3.4 CONDUCT OF TRAINING OPERATIONS

3.4.1 GENERAL

3.4.1.1 AUTHORISATION OF TRAINING FLIGHTS

Before starting a training flight, both student and authorising instructor will sign form 4B09 (*Flight Authorisation Sheet*).

3.4.1.1.1 SOLO FLIGHTS

For a solo flight, the authorising instructor will only sign the authorisation sheet (form 4B09) when they have confirmed the following items:

1. The student has an ARN, current medical certificate and ELP as required.
2. The student has completed all training and examinations as prescribed by the syllabus for the solo flight.
3. The student flight training records indicate that they have achieved the required standard for all elements of competency for the flight.
4. The student has completed 2 hours of dual instrument time including 1 hour instrument flight time if the flight is a first solo cross-country or night flight.
5. The student has been briefed on the objectives, conditions and limitations of the intended solo flight, including the task or route to be flown, number of circuits (if applicable), traffic and ATC considerations, and actions to be taken during an emergency.
6. The student is clear on what they are be authorised to do while on their solo flight.
7. The actual and forecast weather conditions including runway crosswind and last light limitations are suitable after considering the student's previous competence in similar conditions.
8. The daily inspection is complete and certified
9. The pre-flight inspection confirms the aircraft is serviceable.
10. All instruments, navigation equipment and lighting are serviceable as required for the flight.
11. The fuel and oil state is appropriate for the flight.
12. The student carries all appropriate inflight documentation IAW section 2.1.1.

3.4.1.1.2 SUPERVISION OF SOLO FLIGHTS

To supervise a solo flight, the authorising instructor must be:

- at the aerodrome of departure or flying within 15 NM of the departure aerodrome
- contactable during the flight by radio or other electronic means.

During a first solo flight in the circuit, the authorising instructor must be at the airport to actively monitor the progress of the flight visually and if possible via a VHF radio and able to render assistance if necessary.

When a student is on a solo navigation exercise, the authorising instructor must maintain awareness of the weather conditions en-route and at the destination aerodrome. The instructor must also maintain awareness of the student pilot's ETA back at home base and must inform the HOO or supervising instructor if the student has not returned when the expected ETA time has elapsed.

3.4.1.2 OPERATIONS WITHIN TRAINING AREAS

A training area map is located at Appendix 4.1.1.

All instructors and students conducting training other than navigation exercises must conduct all training within the training area.

3.4.1.3 AEROBATICS AND SPINNING

Aerobatics and spinning by solo students is prohibited. However, dual spin training may be conducted by an appropriately qualified instructor in an appropriate aircraft, to familiarise students with the characteristics of a spin and to introduce them to the basic spin recovery technique.

3.4.1.4 SOLO PRACTICE FORCED LANDINGS

The training area map (Appendix 4.1.1) indicates the approved area to conduct solo practice forced landings.

When practicing forced landings, the PIC must not continue the approach below 500 feet above ground level (AGL) unless the approach is to an airfield runway.

During the briefing the student should be reminded that when practicing forced landings, they must keep the engine warm and to be ready to go around at any time and to have all checks required, to ensure a safe go-around no lower than 500 feet AGL.

3.4.1.5 LOW FLYING TRAINING

Advanced Aviation Training authorisation does not permit low flying training. All pilots must ensure they remain at least 500 feet AGL at all times.

3.4.1.6 AERODROME SUITABILITY

Except in an emergency, aircraft operated by Advanced Aviation Training will only be operated to or from aerodromes that are listed in En-Route Supplement Australia (ERSA) or Aeroplane Landings Areas (ALAs)/Helicopter Landing Sites (HLS) that conform to the guidance provided in CASA publication *CAAP 92 1(1)*.

3.4.1.7 COMPANY REGISTER OF SUITABLE ALAS

Form 4B13 (*Aeroplane Landings Areas (ALA) Report Form*) is to be used for compiling a company register of suitable ALAs of fixed wing aeroplane landing areas that are not listed in the ERSA, but have been approved by the HOO.

Information listed in the register is advisory in nature. The HOO should be advised if an amendment is considered necessary.

The PIC must obtain permission to use the ALA when required and is responsible for determining that the area is suitable for the intended operation.

3.4.1.8 STANDARD NAVIGATION ROUTES

All navigation training flights will be conducted IAW the syllabus for the relevant course of training. The routes may be changed with prior permission of the HOO. The HOO will ensure that revised routes will comply with the syllabus outcomes for the exercise.

3.4.1.9 CARRIAGE OF PASSENGERS ON TRAINING FLIGHTS

Unless expressly approved by the HOO, no passengers are to be carried on any training flight unless it is considered that the carriage of a passenger will provide a training benefit.

Under no circumstances are passengers to be carried on a flight during which it is planned to conduct:

- a simulated engine failure
- a system failure that affects the aircraft performance or handling characteristics.

3.4.1.10 OBSERVANCE OF LAST LIGHT LIMITATIONS

Authorising instructors of solo training flights conducted late in the afternoon or evening must ensure that students are aware of last light and are able to complete the flight with an adequate margin.

A day solo cross country flight will not be authorised if the ETA to home base is within 60 minutes of last light. This margin will be increased if adverse weather conditions are likely to bring last light forward.

3.4.1.11 SIMULATION OF INSTRUMENT FLIGHT

When simulating instrument flight, instructors will use company issued instrument flight hood or foggles.

3.4.1.12 SUBMISSION OF FLIGHT PLANS BY STUDENT PILOTS

Before the submission of flight plan details by a student, the authorising instructor must check the flight plan for accuracy. All cross country flights shall have a SARTIME that is to be held by CENSAR.

The use of a flight note and the holding of company SAR should only be used if no other option exists.

3.4.1.13 SUPERVISION OF NIGHT FLYING OPERATIONS

The HOO shall nominate and roster an authorised instructor to supervise night flying operations.

The home base airport meets the requirements for airport lighting and ground facilities. The authorising instructor shall confirm there are no NOTAMs that reduce these levels. The HOO needs to specifically authorise any other airport for this purpose.

If aircraft is to be used for night flying, the authorising instructor will confirm there are no unserviceabilities that prohibit flight at night.

3.4.1.14 PROCEDURES FOR NIGHT FLYING TRAINING

Night flying operations shall be conducted IAW the night flying syllabus in Vol. 5. Additionally, night circuit operations shall be conducted:

- within a radius of 3 NM of the aerodrome reference point and not less than 1000 feet and up to 1500 feet above aerodrome elevation
- night circuit operations shall not be conducted in weather conditions less than:
  - a ceiling of 1500 feet
  - visibility of less than 5 kilometres

3.4.2 FLIGHT LESSON CONDUCT

3.4.2.1 ASSESSMENT OF STUDENT COMPETENCE

Evidence of satisfactory knowledge is obtained through the results of examinations and assessment of underpinning knowledge at pre-flight briefings. The standards for skills are expressed in terms of performance criteria for each element of competency in syllabuses. Evidence of competency in flying skills is obtained by reviewing actual student performance against the standards detailed in the relevant syllabus.

The flight training record is attached to the lesson plan. It includes the standard of performance needed to be demonstrated for each element of that lesson. The instructor will record student performance in the flight training record, highlighting elements where the student is not yet considered to be competent. This will allow future lessons to revisit those items and rectify them.

3.4.2.2 FLIGHT LESSON DEBRIEFING AND RECORDING

As soon as possible after the flight the instructor must debrief the student. The purpose of the debrief is to review the flight in relation to the students' performance against the competencies on the lesson plan. In particular the student needs to be made aware of:

- aspects that meet the criteria
- aspects that need improvement or further training to achieve competency.

The debriefing should also identify items that need to be repeated or that will be introduced in the next lesson.

Immediately after the debriefing, the instructor must complete and file the flight training record.

3.4.2.3 REVIEWING FLIGHT TRAINING RECORDS

The HOO will regularly review the recent flight training records of students. The review must consider, but not be limited to:

- the quality of flight training records, particularly detail where students fail to meet performance criteria standards and recommendations by instructors
- if the lessons given conform to the sequence outlined in the syllabus and take into account previous recommendations
- the details of any standards not initially achieved, but subsequently met within the next few lessons
- recommendations on the need for corrective action if the rate of achievement is consistently poor.

3.4.2.4 UNDERPERFORMANCE OF STUDENTS

If a student consistently fails to achieve competency, this must be investigated by the HOO to determine the cause. Investigation should include, but not be limited to:

- an analysis of the student's flight training records
- discussion with the relevant instructor and student.

The HOO will decide on the remedial course of action.

3.4.2.5 EVALUATION OF TRAINING OUTCOMES FOLLOWING FLIGHT TESTS

The HOO will review all flight test feedback.

If a student fails a flight test assessment, the HOO, based on the feedback, may develop and implement a remedial training program designed to help them achieve competency in those elements previously assessed as not yet competent.

The HOO will also look for deficiencies in the training syllabus, the instructors and the lesson plans, correcting any deficiencies that may be found.

3.5 STUDENT ADMINISTRATION

3.5.1 RECOGNITION OF PRIOR LEARNING

If a student wishes to transfer from another training provider, the HOO will first conduct a flight assessment covering all elements of competency associated with the licence or rating sought, as per *Schedule 1 to the CASR Part 61 MOS*.

The HOO will prepare a training plan based on this assessment flight before the student has received any training.

3.5.2 STUDENT RECORDS

Student records consist of flight training records, flight test results and the results of examinations.

On return from a solo training flight, the student and the authorising instructor will review the conduct of the flight and training outcomes and make any comments on the flight training records.

Where a flight test has been conducted by a visiting examiner, the HOO must obtain a comprehensive written report detailing the outcome of the test and enter the results and comments into the flight training records before their departure.

The flight training records must be maintained in a locked filing cabinet accessible to all instructors at all times.

3.5.3 PROVISION OF FLIGHT TRAINING RECORDS TO STUDENTS

A flight instructor must compete all training records within 7 days of the completion of that flight and provide the student with access to their individual training records.

At no time should students be given access to or shown another students training records.

Advanced Aviation training will provide all instructors with access to training records for all course participants.

A copy of a students personal Flight training records must be made available them within 7 days of the student requesting them.

3.5.4 TRANSFER OF STUDENT FLIGHT TRAINING RECORDS

If another Part 141 operator requests a copy of a student’s flight training records, it must be supplied within 7 days provided the student agrees and has provided written authority.

3.5.5 STUDENT LOG BOOKS

All students must have an accurate and up-to-date log book whilst undertaking training.

When required, the flight instructor assigned to a student must check and certify the accuracy of entries in the student's logbook. This is done by cross referencing the hours entered against the aircraft flight log and the students' training file.

3.5.6 STUDENT FAMILIARITY WITH RELEVANT OPERATIONS MANUAL VOLUME

All students undertaking flight training with the company are required to familiarise themselves with the relevant sections of the company operations as they relate to the activities that the student is undertaking. By signing form 4B09 (*Flight Authorisation Sheet – VH___*), the students agrees they will act IAW the Operations Manual requirements.

3.6 TRAINING COURSES

3.6.1 TRAINING PLANS AND SYLLABUSES

Advanced Aviation Training has elected to use standard syllabuses, lesson plans and planning matrices prepared by CASA. These syllabuses are reproduced IAW those listed in Vol. 5.

3.6.2 GROUND TRAINING COURSES

Reserved

3.7 GROUND EXAMINATIONS

3.7.1 GAINING KNOWLEDGE TO PASS AERONAUTICAL KNOWLEDGE EXAMINATIONS

Students will be required to self-study to gain the knowledge required to pass aeronautical knowledge examinations.

Instructors must ensure that students have passed their relevant aeronautical knowledge examinations prior to undertaking pre-flight tests.

3.7.2 AUTHORITY FOR THE CONDUCT OF GROUND EXAMINATIONS

During the induction process, the HOO will train and assess instructors in the conduct of Advanced Aviation Training ground examinations and complete the relevant section on form 4B10 to acknowledge this authorisation.

3.7.3 GROUND EXAMINATION FACILITY

Advanced Aviation Training holds approval by CASA to conduct Pilot Examination Office (PEXO) Exams.

Ground examinations will be conducted when required using the facilities in Building 2. The facilities are used on the basis that they meet minimum CASA specifications for the conduct of PEXO exams. If at any time it becomes apparent that they are lacking in any way, the HOO is to be advised immediately so that the deficiency can be rectified.

Before conducting an exam, invigilating staff must always ensure that any learning materials (including posters and maps) including personal electronic devices, that may assist students are removed from the room and walls.

While an exam is in progress, invigilators are to place a sign on the classroom door to remind other staff and students that an exam is in progress and to therefore keep distracting noises and conversations to a minimum.

3.8 FLIGHT TESTS AND FLIGHT REVIEWS

3.8.1 FLIGHT TESTS

3.8.1.1 FLIGHT TEST PROCEDURES

Before arranging a flight test, the HOO must check that the applicant meets the requirements in *CASR 61.235* to take the test. Following this, the HOO will certify that these requirements have been complied with in the student's flight training records.

Before booking a flight test for a flight crew licence, the HOO must certify that all requirements stated on the flight test application form are complied.

3.8.1.2 BOOKING FLIGHT TESTS

The HOO will book the flight examiner and make the following items available:

- an appropriately equipped briefing room suitable for the test
- a suitable serviceable aircraft with a means of simulating instrument flight
- the training records of the applicant including the certification mentioned above
- access to briefing materials and a means to carry out flight notification.

3.8.1.3 PROCEDURE IF A FLIGHT TEST IS FAILED

If a flight test is failed, the HOO will carry out the procedure detailed in section 3.4.2.5.

3.8.2 FLIGHT REVIEWS

Advanced Aviation Training conducts flight reviews in single engine aircraft.

The objective of the flight review is to ensure the holder of the rating is competent in each unit of competency of the *Part 61 MOS* for the rating.

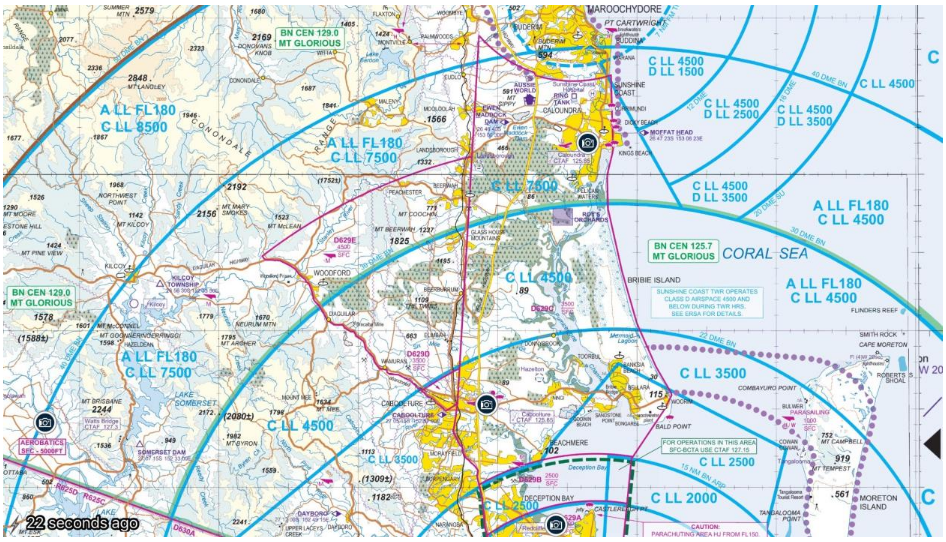
The flight review is to ensure the candidate continues to maintain competency IAW *CASR 61.385*.

VOLUME 4 APPENDICES AND FORMS

4.1 APPENDICES

4.1.1 TRAINING AREA MAP

Redcliffe Training Area Map



The confines of D629C define the Training area boundries.

4.1.2 DRUG AND ALCOHOL MANAGEMENT PLAN (DAMP)

Refer to section 1.14.4.

4.1.3 HUMAN FACTORS AND NON-TECHNICAL SKILLS PROGRAM

Advanced Aviation Training HF/NTS internal training syllabus is shown below.

Flight Instructor training in Human factors principles and non- technical skills: Training development	
Delivery Method: Facilitated Discussion with HOO **Training structure:** The Training syllabus is presented against a three year cycle, delivering selected modules during the calendar year. Training structure should incorporate the following approach: **Schedule A** – Induction training Schedule A is only required for IT2 (Induction training) **Schedule B** – Operational incident and risk profile review Review of contributory factors in similar operational training incidents, this schedule is required each cycle. **Schedule C** – HF competency element modules For each cycle, the HOO will select 4 modules of training not repeating any modules from schedule C until these have all been completed*. ***Induction –** Module A, Module B, Module C#, Module C#, Module C#* ***Refresher –** Module B, Module C#, Module C#, Module C#, Module C#.* *Variation of the syllabus due to local events may be appropriate if directed by the HOO. **Assessment Methodology:** Facilitator assessment of appropriate level of engagement during interactive question and answer session.	**Training Materials:** **Safety behaviours: Human factors for Pilots/ Engineers.** **Organisation incident reports** **A selection of relevant events that relate to specific HF elements and NTS countermeasures for consideration and review.**

<table>
<tr><th>Human Factors and Non-technical skills training Schedule A (Induction)</th><th>Notes</th></tr>
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Module A. Induction and introduction to Human factors

- Refresh and further develop the need to address human factors in aviation operations
  - Highlight that human performance issues continue to dominate aviation accidents statistics
  - The challenge of managing error and safe operations in the training environment
- Identify the sources and interactions that influence human performance
  - Present either (or both) the PEAR model or SHELL model
  - Outline the human factor elements associated to each element of the models used
  - Illustrate how improved technical and non- technical skills can positively support safety and performance
- Outline the organisations development of procedures and the use of human factors knowledge to enhance the safe undertaking of training activities
- Explain the format of the course and the expected outcomes in enhancing existing HF knowledge in the flight training environment

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Session A

(To be delivered for Instructor induction and as an introduction to HF and NTS)

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<tr><th>Human Factors and Non-technical skills training
Schedule B (Operational incident and risk profile review)</th><th>Notes</th></tr>
<tr><td>

Module B. Safety incident HF Risks review

- Review both a sample of recent relevant safety incidents. (for example Ground strikes, heavy landings, incorrect configurations.)
  - Determine key HF elements that contributed to the events
  - Discuss the likelihood or potential of these incidents within your operation
  - Determine potential solutions and Non-technical skills and behaviours that may have reduced the potential of the event

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Conducted on induction and each cycle

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Human Factors and Non-technical skills training Schedule C – subjects – (select 3 of the following subjects)	Notes

Module C1 - Fatigue
• Determine the participants understanding of the following elements:
  ○ What is fatigue?
  ○ The impact of fatigue impairment
  ○ The causes of fatigue
    ▪ personal factors that may increase the impact
    ▪ organisational factors
    ▪ operational factors
• Identify strategies to manage fatigue
  ○ Personal management
  ○ Fitness to fly – Student and Instructor
• Identify the relevant processes and reporting requirements to manage fatigue within your organisation	

Module C2 – Stress
• Determine the participants understanding of stress as a contributor to degraded human performance and safety incidents.
• Workload –
  ○ Overload and underload
  ○ Personal stress – Instructor fitness to fly
    ▪ Domestic Stress
  ○ Student stress – student fitness to fly
• Describe the influence of stress on flight training and learning (consider the areas of overload and underload on flight training activities)
• Identify steps to manage the stress
  ○ Managing personal stress
  ○ Managing the instructional and training environment to minimize student stress
• Identify available organisational assistance	

Module C3 – Alcohol and other drugs (AOD) (Effects on Human performance)
• Determine the participants understanding of the influence of AOD on human performance in the training environment. Consider reviewing the following elements;
    ○ your organisational AOD policy
    ○ your organisational AOD testing program
    ○ your organisational AOD response program
    ○ the influence of drugs and alcohol on brain and behavior
    ○ depressants, Stimulants and Hallucinogens
    ○ metabolising Alcohol
• Identify your organisational expectations and processes to manage AOD and safety
• Identify the relevant support and assistance available to employees	

Module C5 - Communication
• Determine the participants understanding of Communication models, methods and barriers to communication. Consider including discussion points such as;
    ○ One way and two way models
    ○ Methods including;
        ▪ Verbal, non-verbal
        ▪ Phrases and jargon
        ▪ Written communication
        ▪ Information transfer (use of other mediums)
• Discuss the relevance to safety (consider using examples of communication failures)
• Discuss the relevance to flight training activities
    ○ The importance of briefings
    ○ Overcoming barriers to communication
        ▪ The influence of authority gradients
        ▪ Unfamiliarity of formal language
        ▪ Communication errors
	Note: Ideally utilise examples of flight instruction incidents

Module C6 - Teamwork • Determine the participants understanding of teamwork and how this relates to the flight training environment. • Identify the positive characteristics of teams and supporting conditions for team work • Discuss how the characteristics and conditions may relate to: ○ The local aerodrome environment and training locations ▪ Single pilot operations ▪ Dual and instruction activities ○ The Instructor and student in the operating environment ▪ Instructor to student briefings ▪ Student to instructor briefings ▪ Control handover ▪ Read-back and radio communications	**Note: Ideally utilise examples of flight instruction incidents**
Module C7 – Leadership • Identify any gap in participants understanding of leadership • Describe the role of leadership and followership concepts to the flight instruction environment. Consider refreshing participants understanding of the following subjects; ○ Styles and adaptability ○ Authority and Assertiveness ○ Planning and prioritising ○ Monitoring and managing workload ○ Creating an appropriate operating climate – setting the tone ○ Leadership under stress ○ Managing conflict • Practical safety leadership practices • Airmanship ○ Outline and discuss the expected behaviours of the organization regarding professionalism ○ Supporting a reporting culture and positive safety environment	

Module C8 – Situation awareness
• Determine the participants understanding of Situation awareness as a process and product and what differences may be relevant in the training environment. Consider reviewing the following:
  ○ Perception, comprehension, projection Communication: expectation and meaning
  ○ Impact of workload and stress
  ○ Goal/ task fixation – cognitive tunneling
• Describe and discuss potential situations and personal events that were influenced by a 'loss of situation awareness'. (Note if there are no issues raised, use examples from industry reports that relate to your operating environment).
  ○ Review factors that may have reduced SA in the discussed scenarios
  ○ Identify countermeasures that could have been applied
• Identify practical strategies to maintain and enhance situational awareness
  ○ Aviate, navigate, communicate
  ○ Planning and briefing
  ○ Seek information
  ○ Plan before you communicate, Active listening, read-back, and review
  ○ Eyes out, eyes in.
  ○ Making time.
	Note: Ideally utilise practical examples of flight instruction incidents.

Module C9 – Decision Making
• Determine the participants understanding of Decision making as a process and product and what differences may be relevant in the training environment.
• Discuss decision making strategies.
  ○ Consider the influence of the training environment and the level of capability of the student
  ○ The risk of assumptions
  ○ Communication and sourcing information
  ○ Decision making and problem solving
    ▪ Skill based
    ▪ Rule based
    ▪ Knowledge based
• Practical approaches to enhancing decision making performance and opportunity.
  ○ If you can… make time or remove the risk
  ○ Application of the tools in an operational environment
	Note: Ideally utilise practical examples of flight instruction incidents.

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Module C10 – Threat and Error Management

- Determine the participants understanding of human error. Consider reviewing:
  - Error vs performance variability
  - Define threats and discuss
    - External and internal threats
    - Threats associated to your operating environment (i.e. ab initio vs advanced training and student performance)
  - Define errors and discuss.
    - Skills based error
    - Action error
    - Knowledge based error
  - Review undesired aircraft states
  - Apply the discussion points to an operational scenario, to illustrate deviations from an optimum training flight. Determine how these could be managed using a threat and error management approach.
- Identify practical Threat and Error Management counter measures that relate to single and dual pilot training activities.
  - Discuss and identify the use of 'thinking ahead'.
    - The requirement to plan
    - The use of briefings
    - Allocation of tasks and control authority
    - Actively check for understanding
    - Plan execution and monitoring performance
    - Avoid, Trap and Mitigate
    - Providing tolerance for error
    - Enquiry and assertion (Instructor and Student)

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Note: Ideally utilise practical examples of flight instruction incidents.

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Module C10 – Threat and Error Management
• Determine the participants understanding of human error. Consider reviewing:
  ○ Error vs performance variability
  ○ Types of error
• Determine the participants understanding of Threat and Error management as a countermeasure. Discuss the following components of the threat and error management approach and the contribution of the flight training environment:
  ○ Define threats and discuss
    ▪ External and internal threats
    ▪ Threats associated to your operating environment (i.e. ab initio vs advanced training and student performance)
  ○ Define errors and discuss.
    ▪ Skills based error
    ▪ Action error
    ▪ Knowledge based error
  ○ Review undesired aircraft states
  ○ Apply the discussion points to an operational scenario, to illustrate deviations from an optimum training flight. Determine how these could be managed using a threat and error management approach.
• Identify practical Threat and Error Management counter measures that relate to single and dual pilot training activities.
  ○ Discuss and identify the use of 'thinking ahead'.
    ▪ The requirement to plan
    ▪ The use of briefings
    ▪ Allocation of tasks and control authority
    ▪ Actively check for understanding
    ▪ Plan execution and monitoring performance
    ▪ Avoid, Trap and Mitigate
    ▪ Providing tolerance for error
    ▪ Enquiry and assertion (Instructor and Student)
	Note: Ideally utilise practical examples of flight instruction incidents.

Module C11 Airmanship • Determine the participants understanding of airmanship and discuss scenarios of ineffective airmanship • Discuss the qualities of effective airmanship • Discuss the models of airmanship • Look at examples of how to improve airmanship and outline the expected behaviours of the organisation regarding airmanship	

4.2 FORMS

Form Number	Title	Rev #	Date
Form 4B01	Company Operations Manual Acknowledgement Record	1	
Form 4B02	Audit of Compliance & Facilities	1	
Form 4B03	Initial Instructor Employee Record	1	
Form 4B04	Key Personnel Familiarisation Training Record	1	
Form 4B05	Instructor Induction Training	1	
Form 4B06	Instructor Induction Training - Course IT2	1	
Form 4B07	Instructor Standardisation & Proficiency Check Report	1	
Form 4B08	Student Personal Details & Flight Training Record	1	
Form 4B09	Flight Authorisation Sheet	1	
Form 4B10	Instructor Qualifications & Approvals Register	1	
Form 4B11	Flight Crew Member Flight & Duty Record	1	
Form 4B12	Registered Aircraft Details	1	
Form 4B13	Aeroplane Landings Areas (ALA) Report Form	1	
Form 4B14 -	Aircraft Checklist Vans RV-10 VH-BKK	1	
Form 4B14 -	Aircraft Checklist Vans RV-10 VH-XTE	1	
Form 4B14 -	Aircraft Checklist Vans RV-14 VH-JBR	1	
Form 4B14 -	Aircraft Checklist Sirrus SR-20 VH-SRL ....(DIGITAL CHECKLIST AS PER SIRRUS AFM)	1	
Form 4B14 -	Aircraft Checklist Vans RV-6 VH-HRV	1	
Form 4B14 -	Aircraft Checklist Cessna 152 VH-BUQ	1	
Form 4B14 -	Aircraft Checklist Cessna 150M VH-MFJ	1	
Form 4B14 -	Aircraft Checklist Cessna 172RG VH-BAY	1	
Form 4B15	Aircraft Journey Log	1	
		1	

AIRCRAFT NORMAL CHECKLIST VH-BUQ

PREFLIGHT	ENGINE RUN UP
• Check cabin / cabin equipment • Control locks removed • Ignition switch off • Master switch on • Fuel quantity indicators check • Flaps extend full. • Master switch off • Fuel shutoff valve check on • Documents check • External prefight conduct as per POH	• Check all clear behind • Throttle 1700 RPM ➢ Magnetos check RPM drop (125 Max drop 50 max Differential) ➢ Carburettor heat check (RPM drop) ➢ Engine instruments check ➢ Suction check ➢ Throttle Check idle ➢ Throttle set 1000 RPM
PRESTART	**BEFORE ENTERING RUNWAY**
• Seat belts & shoulder harnesses adjust • Fuel shutoff valve check on • Radios and electrical equipment off • Brakes test and set • Circuit breakers check all in. • Mixture set rich • Carburettor heat set cold • Prime 3 strokes if cold 0 if warm • Throttle set ½ Inch open / closed if engine is warm • Propeller area check all clear "Clear Prop" • Master switch on • Rotating beacon on • Ignition switch Start	• ***Radio "Call given"*** • ***Strobe lights on*** • ***Transponder set ALT*** **AFTER TAKEOFF** • ***300 Ft flaps up*** • ***Temperature and pressure check*** **BEFORE LANDING** • ***B - Brakes*** • ***U – Undercarriage*** • ***M - Mixture*** • ***P- Pump / pressure*** • ***F – Fuel sufficient / selector*** • ***I – Instruments Green range*** • ***S – Switches*** • ***C – Carburettor heat*** • ***H – Hatches and Harnesses***
AFTERSTART	**AFTER LANDING CLEAR OF THE RUNWAY**
• Throttle set 1000 RPM • Oil pressure check Green within 30 sec. • Ammeter check charging • Radios on frequency checked • Transponder set STBY • Flaps up	• Clear of runway radio call • Brakes set • Identify flaps and select up • Strobe / landing lights off • Brakes release taxi to parking
BEFORE TAKE OFF	**SHUTDOWN / SECURING**
• Parking brake set • Cabin doors closed and latched • Flight controls free and correct • Flaps set 0° or 10°(Short field) • Flight instruments set • Fuel shutoff valve on • Mixture rich • Elevator trim set for take off • Throttle Friction adjusted.	• Brakes on • Radios and electrical equipment off • Mixture cut off • Ignition switch off key removed • Master switch off • Control lock install • Paper work complete • Secure aircraft / tie downs or hanger

***** Memory checks given in Italic blue***

AIRSPEEDS	FORCED LANDING

AIRCRAFT EMERGENCY CHECKLIST VH-BUQ
(REFER TO POH FOR MORE COMPREHENSIVE CHECKLISTS

• GLIDE	60 KIAS
• MANEUVERING	
○ 1670 Lbs	104 KIAS
○ 1500 Lbs	98 KIAS
○ 1350 Lbs	93 KIAS
• PRECAUTIONARY LANDING WITH POWER	55 KIAS
• LANDING WITHOUT POWER	
○ FLAPS UP	65 KIAS
○ FLAPS DOWN	60 KIAS

- ***FLY THE AIRCRAFT AIRSPEED 60 KIAS***
- **SELECT LANDING AREA**
- **IF time permits:**
- **MIXTURE IDLE CUT OFF**
- **FUEL VALVE CLOSE**
- **IGNITION SWITCH OFF**
- **WING FLAPS AS REQUIRED**
- **MASTER SWITCH OFF**
- **DOORS UNLATCH PRIOR TO TOUCHDOWN**
- **TOUCHDOWN SLIGHTLY TAIL LOW**
- **BRAKES APPLY HEAVILY**

ENGINE FAILURE DURING TAKE OFF

- ***THROTTLE IDLE / CLOSED***
- ***BRAKES APPLY***
- ***WING FLAPS RETRACT***
- ***MIXTURE IDLE CUT OFF***
- ***IGNITION SWITCH OFF***
- ***MASTER SWITCH OFF***

ENGINE FAILURE AFTER TAKEOFF

- ***FLY THE AIRCRAFT AIRSPEED 60 KIAS***
- ***SELECT LANDING AREA***
  IF time permits:
- ***MIXTURE IDLE CUT OFF***
- ***FUEL VALVE CLOSE***
- ***IGNITION SWITCH OFF***
- ***WING FLAPS AS REQUIRED***
- ***MASTER SWITCH OFF***

PRECAUTIONARY LANDING WITH POWER

- ***FLY THE AIRCRAFT AIRSPEED 60 KIAS***
- **SELECT LANDING AREA**
- **WING FLAPS 20°**
- **PRECAUTIONARY SEARCH PROCEDURE**
- **WING FLAPS 30° ON FINAL APPROACH**
- **IGNITION SWITCH OFF**
- **FINAL APPROACH SPEED 55 kIAS**
- **MASTER SWITCH OFF**
- **DOORS UNLATCH PRIOR TO TOUCHDOWN**
- **TOUCHDOWN SLIGHTLY TAIL LOW**
- **IGNITION SWITCH OFF**
- **BRAKES APPLY HEAVILY**

ENGINE FAILURE DURING FLIGHT (Trouble Check)

- ***FLY THE AIRCRAFT AIRSPEED 60 KIAS***
- **SELECT LANDING AREA**
- **CARBURETTOR HEAT ON**
- **CECK PRIMER IN AND LOCKED**
- **CHECK FUEL VALVE ON**
- **MIXTURE RICH**
- **IGNITION SWITCH "BOTH" OR START IF PROPELLOR HAS STOPPED**

DITCHING

- **TRANSMIT MAYDAY SQUAWK 7700**
- **SECURE OR JETTISON OBJECTS**
- **APPROACH INTO WIND PARALLEL TO SEA SWELLS**
- **WING FLAPS 30°**
- **ESTABLISH 300 FT/MIN DESCENT AT 55 KIAS**
- **TOUCHDOWN IN A LEVEL ATTITUDE**

FIRE DURING START

- **CRANKING ENGINE CONTINUE**
- **IF ENGINE STARTS**
  - **RPM SET 1700 FOR A FEW MINUTES**
  - **ENGINE SHUTDOWN AND INSPECT DAMAGE**
- **IF ENGINE FAILS TO START**
  - **CRANKING ENGINE CONTINUE**
  - **FIRE EXTINGUISER OBTAIN**
- **SHUT DOWN AIRCRAFT / FUEL OFF**
- **MASTER SWITCH & IGNITION BOTH OFF**

FIRE INFLIGHT

- **MIXTURE IDLE CUT OFF**
- **FUEL SHUT OFF VALVE OFF**
- **MASTER SWITCH OFF**
- **CABIN HEAT AND AIR OFF**
- **AIRSPEED 85 KIAS (*IF FIRE IS NOT EXTINGUISHED INCREASE GLIDE SPEED TO FIND AN AIRSPEED WHICH WILL PROVIDE INCOMBUSTABLE MIXTURE)***
- **GO TO FORCED LANDING CHECKLIST**

AIRCRAFT NORMAL CHECKLIST VH-HRV

PREFLIGHT

- Check cabin / cabin equipment.
- Check ignition off
- master switch on
- Fuel pump on (pressurize system)
- fuel pump off
- fuel quantity check
- stall warning check
- master off
- Fuel drain x3 tanks + engine
- Engine oil check min 5 qtz
- airframe secure no damage
- **Rudder lock removed**
- All covers and straps clear of aircraft

ENGINE RUN UP

- Suitable location preferably into wind
- Brakes held on
- Fuel selected fullest tank
- Set Throttle RPM 1500
- Check ignition L & R then both
- Throttle Idle check 650 rpm
- Set Throttle 1000 rpm

BEFORE ENTERING RUNWAY

- ***Radio "Call given"***
- ***Strobe lights on***
- ***Transponder set ALT***

PRESTART

- Lock door left side lock and above lock
- Adjust seats and Harnesses
- Brakes check pressure on hold on
- Ignition switch off
- Fuel selected on L or R (least or left)
- Master switch on
- Electric fuel pump on
- Prime engine 3 pumps cold 2 pumps hot
- Set throttle 5 mm in
- Check and call "Clear Prop"
- Ignition on
- Engage starter

AFTER TAKEOFF

- ***300 Ft flaps up***
- ***Temperature and pressure check***
- ***1000 Ft fuel pump off***
- ***Check fuel pressure***

BEFORE LANDING

- ***B - Brakes***
- ***U – Undercarriage***
- ***M - Mixture***
- ***P- Pump / pressure***
- ***F – Fuel sufficient / selector***
- ***I – Instruments Green range***
- ***S – Switches***
- ***C – Carburettor heat***
- ***H – Hatches and Harnesses***

AFTERSTART

- Set RPM 1000
- Check oil pressure **GREEN** range
- Check Ammeter charging
- Suction **GREEN**
- Electrical switches on as required
- Radio checked and set.
- Brakes checked
  Instruments checked and set

AFTER LANDING CLEAR OF THE RUNWAY

- Clear of runway radio call
- Brakes set
- Identify flaps and select up
- Strobe / landing lights off
- Brakes release taxi to parking

BEFORE TAKE OFF

- Parking brake set
- Cabin doors closed and latched
- Flight controls free and correct
- Flaps set 10°
- Flight instruments set
- Fuel SET FULLEST TANK
- Mixture rich
- ELECTRIC FUEL PUMP ON
- Elevator trim set for take off
- Throttle Friction adjusted.

AIRCRAFT SHUTDOWN

- Brakes on
- Unnecessary electrical equipment off
- Idle 1000 RPM
- Electric Fuel pump off
- Mixture to idle Cut-Off
- Ignition switch off
- Master switch off
- Seat belts release
- Canopy open
- Paperwork and secure aircraft

AIRCRAFT EMERGENCY CHECKLIST

*** Memory checks given in Italic blue*

AIRSPEEDS

AIRCRAFT AIRSPEEDS	
VNE	182 KIAS
VNO	135 KIAS
V_{FE}	82 KIAS
V_A	115 KIAS
VS FLAPS UP	48 KIAS
VS FULL FLAP	45 KIAS
TOSS	60 KIAS
VAPP FINAL	60 KIAS
MAX XW	12 KIAS

FORCED LANDING

- GLIDE 70 KIAS
- CHECK ENGINE TEMPERATURES
- CHECK FUEL CONTENTS SUFFICIENT AND SELECTED ON
- CHECK IGNITION ON
- FUEL PUMP ON
- MIXTURE RICH
- CHECK THROTTLE FULL RANGE
- TRY RESTART THROTTLE SET ENGAGE STARTER

NO RESTART CAPABILITY

- CONDUCT FORCED LANDING

THROTTLE CLOSED
IF TIME PERMITS "MAYDAY CALL"
FUEL SELECTOR OFF
ELECTRIC FUEL PUMP OFF
MASTER SWITCH OFF
IGNITION SWITCHES OFF
HARNESS SECURE
HATCHES UNLOCKED

ENGINE FAILURE DURING TAKE OFF

- *THROTTLE IDLE / CLOSED*
- *BRAKES APPLY*
- *WING FLAPS RETRACT*
- *MIXTURE IDLE CUT OFF*
- *IGNITION SWITCH OFF*
- *MASTER SWITCH OFF*

ENGINE FIRE DURING START

- THROTTLE CLOSE
- FUEL SELECTOR OFF
- FUEL PUMP OFF
- CONTINUE TO CRANK ENGINE
- IF FIRE CONTINUES

IGNITION OFF
MASTER OFF
VACATE AIRCRAFT

ENGINE FAILURE AFTER TAKEOFF

- *FLY THE AIRCRAFT AIRSPEED 70 KIAS*
- *SELECT LANDING AREA*
  IF time permits:
- *MIXTURE IDLE CUT OFF*
- *FUEL VALVE CLOSE*
- *IGNITION SWITCH OFF*
- *WING FLAPS AS REQUIRED*
- *MASTER SWITCH OFF*

ENGINE FIRE INFLIGHT

- THROTTLE OPEN
- FUEL SELECTOR OFF
- FUEL PUMP OFF
- CONDUCT FORCED LANDING

Form 4B01 Company Operations Manual Acknowledgement Record

Instructions:

1. All instructors must sign this sheet in the paper master copy of the Operations Manual. The master copy is held by the HOO.
2. By signing this acknowledgement record, instructors are certifying that they have read the manual, understood and agreed to comply with the procedures, instructions and data contained within.
3. Each person required to sign must do so initially before commencing operations with the company and after any amendment to the manual.

Version number	Name	Signature	Date

ADVANCED AVIATION TRAINING

Form 4B02 Audit of Compliance & Facilities

Date of Audit:		For period (Dates):	From:	To:
Conducted by:				

COMPLIANCE	Comments	Compliant?
Fuel records		Y/N
Maintenance releases		Y/N
Instructor records		Y/N
Flight & duty records		Y/N
DAMP recurrency		Y/N
A/C journey log		Y/N
Examinations		Y/N
Student flight training records		Y/N
Student log books		Y/N

FACILITIES & RESOURCES		Adequate?
Class rooms & briefing areas:		Y/N
Ops Room:		Y/N
Training aids:		Y/N
Instructors:		Y/N
Aircraft:		Y/N

Any identified deficiencies?	YES / NO
What, if any, improvements can be made?	....

CEO			
Acknowledgement:	No Further Action ❑ Discuss with HOO ❑		
Signed:		Date:	

Form 4B02 Date Audit of Compliance & Facilities Page 1 of 1

ADVANCED AVIATION TRAINING

Form 4B03 Initial Instructor Employee Record

Personal Details:

Name:				**ARN:**	
Address:					
Phone:	**Business:**	**After hours:**	**Mobile:**		
Email:					

Next of Kin Details:

Name:				**Relationship:**	
Address:					
Phone:	**Business:**	**After hours:**	**Mobile:**		
Email:					

Qualifications:

Licence type:		**Aeroplane Category Endorsements:**	**A**	**H**	**G**	Other

Operational Ratings:	**FIR**	**NVFR**	**PIFR**	**IR**	**LL**	**Class Ratings:**	**SEA**	**MEA**	Other

Design Feature Endorsements:	**MPPC**	**TWU**	**RU**	**GTE**	**PXS**	Other

Flight Activity Endorsements:	**SPIN**	**AERO**	**FF**	**FAERO**	Other

FI Training endorsements:	**1**	**2**	**3**	**NVFR**	**SPIN**	**DF**	**Aero**	Other

Induction Process Sign-off: **(certification of all items is required to conduct authorised flight training)**

Requirement	Sighted/Completed (signature)	Date
Medical Certification:		
Company Induction Training (IT1):		
HF/NTS Training (IT2):		
Initial S&P Check:		

ADVANCED AVIATION TRAINING

Form 4B04 Key Personnel Familiarisation Training Record

Name:		**ARN:**	
Position:		**Date of Training:**	

Subjects / Discussion points	Complete
Overview of company operation and scope of training conducted	Y/N
Company Operations Manual content, structure and amendment processes	Y/N
Regulatory authorisation and compliance procedures	Y/N
Outline of Company structure and governance	Y/N
Internal reporting and communication procedures	Y/N
Outline of company administration systems	Y/N
Change management processes	Y/N
Company DAMP	Y/N
Company Safety policy and management principles	Y/N
Responsibilities & duties of position, supporting processes and procedures	Y/N
Summary of relevant *CASR Parts 61* and *141*	Y/N
Introduction to Company HF/NTS principles	Y/N
Rostering and fatigue management	Y/N
The following items are not required for the CEO position	Y/N
Training management	Y/N
Instructor training, standardisation and proficiency checks	
Training record management	Y/N
Flight testing	Y/N
Flight reviews	Y/N
Comments:	Y/N
Trainer's signature:	

ADVANCED AVIATION TRAINING

Form 4B05 Instructor Induction Training – Course IT1

Name:		ARN:	
Position:		Date of Training:	

Subjects / Discussion points	Complete
Outline of Company structure and governance	Y/N
Authorised Part 141 training conducted by the company	Y/N
Company Operations Manual content, structure and amendment processes	Y/N
Company Safety policy and management principles	Y/N
Principles of CBT	Y/N
Syllabuses and lesson plans	Y/N
Training record management	Y/N
Company standardisation program	Y/N
Individual responsibility to only conduct training authorised	Y/N
Instructor responsibility to maintain qualifications & recency	Y/N
Aircraft refuelling	Y/N
Aircraft maintenance certification	Y/N
Rostering and fatigue management	Y/N
Change management processes	Y/N
Company DAMP	Y/N
Completion of CASA 'Alcohol and other Drugs' eLearning	Y/N / N/A
Outline of company administration systems	Y/N

Comments:
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IT1 completed?	Name:	Signed:	Date:

Form 4B05 Date Instructor Induction Training – Course IT1 Page 1 of 1

ADVANCED AVIATION TRAINING

Form 4B06 Instructor Induction Training – Course IT2

Name:		**ARN:**	
Position:		**Date of Training:**	

Subjects / Discussion points	**Complete**
Fatigue	Y/N
Stress	Y/N
Alcohol and other drugs	Y/N
Communication	Y/N
Teamwork	Y/N
Leadership	Y/N
Situational awareness	Y/N
Decision making	Y/N
Threat and error management	Y/N
Airmanship	Y/N
	Y/N
	Y/N
	Y/N
	Y/N
	Y/N
	Y/N
	Y/N
	Y/N

Comments:

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IT2 completed?	**Name:**	**Signed:**	**Date:**

ADVANCED AVIATION TRAINING

Form 4B07 Instructor Standardisation & Proficiency Check Report

Instructor name:		ARN:		Date of check:	

Briefing topic:					
Followed lesson plan?	YES / NO	Review questions?	YES / NO	At standard?	YES / NO

Comments:
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Lesson flown:					Flight time
Pre-flight brief to standard?	YES / NO	Review questions?	YES / NO	At standard?	YES / NO

Comments:
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....

Check Pilot's Signature	Date
Instructor's Signature	**Date**

ADVANCED AVIATION TRAINING

Form 4B08 Student Personal Details & Flight Training Record

Personal Details:

Name:			
Address:			
Phone #:	Business:	After hours:	Mobile:
Email:			

Next of Kin Details:

Name:		**Relationship:**	
Address:			
Phone:	Business:	After hours:	Mobile:
Email:			

Credentials & Past Training Experience:

ARN:		**Medical:**	Class:	Validity:
RAAus Membership Number :		**Member Type:**		Expiriy:
Last medical:	Place:	Date:	Doctor's name:	
Previous training organisation/s:		**Previous training records received?**	YES / NO / N/A	
Hours Last 12 mths: (if applicable)		**Last Flight:** (if applicable)	Date:	
A/C Types Flown:				

Previous Flying Summary:

ALL FLYING (hrs)					NAV (hrs)		INSTRUMENT (hrs)		
PIC DAY	PIC NGT	DUAL DAY	DUAL NGT	TOTAL	DUAL X/C	PIC X/C	A/C I.F.	SIM I.F.	TOTAL I.F.

Training Milestones:

AERONAUTICAL KNOWLEDGE		
SUBJECT	DATE	CERTIFIED BY
Pre-Solo Air legislation		
T/A Solo Air legislation		
BAK		
NAV		
Radio		
CTA/CTR		
PPL Theory		

FLYING TRAINING		
EVENT	DATE	CERTIFIED BY
ELP		
First Flight		
First Solo		
First T/A Solo		
RPL		
First Solo NAV		
PPL		
NVFR		

ADVANCED AVIATION TRAINING

Form 4B09 Flight Authorisation Sheet – VH___

Date	Student	Route/Flight Details	D/S	Fuel on board at start	VDO Out	VDO In	Total	Student Signature*	Instructor Signature*

***Signature indicates student and instructor will comply with Operations Manual requirements.**

Form 4B09 Date *Flight Authorisation Sheet* *Page 1 of 1*

ADVANCED AVIATION TRAINING

Form 4B10 Instructor Qualifications & Approvals Register

PILOT		Due Dates							Training Endorsements and Company Approvals	Additional Approvals*
NAME	ARN	S&P	MED	FPC	IPC	DAMP	HF/ NTS	ASIC		
Blogs	999999	01/01/16	01/01/16	22/12/16	01/01/16	01/01/16	01/01/16	01/01/16	1 2 3 SP NV AE DF SEA MEA FS	Senior Instructor
									1 2 3 SP NV AE DF SEA MEA FS	
									1 2 3 SP NV AE DF SEA MEA FS	
									1 2 3 SP NV AE DF SEA MEA FS	
									1 2 3 SP NV AE DF SEA MEA FS	
									1 2 3 SP NV AE DF SEA MEA FS	
									1 2 3 SP NV AE DF SEA MEA FS	
									1 2 3 SP NV AE DF SEA MEA FS	
									1 2 3 SP NV AE DF SEA MEA FS	
									1 2 3 SP NV AE DF SEA MEA FS	
									1 2 3 SP NV AE DF SEA MEA FS	
									1 2 3 SP NV AE DF SEA MEA FS	
									1 2 3 SP NV AE DF SEA MEA FS	

Legend: **S&P** Standardisation & Proficiency Check, **MED** Medical Certificate, **FPC** Flight Proficiency Check , **IPC** Instructor Proficiency Check, **DAMP** Drug & Alcohol Management Plan, **HF/NTS** Human Factors/Non-technical Skills, **ASIC** Aviation Security Identification Card, **SP** Spin; **NV** Night VFR, **AE** Aerobatics, **DF** Design Feature, **SEA** Single-engine aircraft, **MEA** Multi-engine aircraft, **FS** First Solo
*Additional approvals may include design feature endorsement, conduct of ground examinations, etc.

Form 4B10 Date *Instructor Qualifications & Approvals Register* *Page 1 of 1*

ADVANCED AVIATION TRAINING

Form 4B11 CAO 48.1 – Flight Crew Member Flight & Duty Record

FCM:	NAME	From:	SUNDAY:	INSERT DATE				Until:	SATURDAY:	INSERT DATE
Date	**FDP start**	**FDP finish**	**Total Duty**	**FDP extended?**	**Total Flight**	**Flt time extended?**	**28 Day Flt Time**	**365 Day Flt Time**	**Remarks**	**Signature**
					Brought Forward					
SU				Y/N		Y/N				
MO				Y/N		Y/N				
TU				Y/N		Y/N				
WE				Y/N		Y/N				
TH				Y/N		Y/N				
FR				Y/N		Y/N				
SA				Y/N		Y/N				
					Carried Forward					

EXTENSIONS:

1. Was your FDP extended - YES/NO? (Annotate column as appropriate). If "YES" please provide a brief summary or reasons for the extension in the remarks section.
2. Did your flight time exceed 7 hours - YES/NO? (Annotate column as appropriate). If "YES" please provide brief summary and reasons for the extension in the remarks section.

ADVANCED AVIATION TRAINING

Form 4B12 Registered Aircraft Details

The aircraft listed below have been, or are currently being operated for Part 141 flight training.

Aircraft in Red are Experimental and Training can only be conducted in Accordance with CAR 262AP(2)

Make	Model	Registration	Period of Operation	
			From	To
VANS Aircraft	RV-10	VH-BKK		Perm
VANS Aircraft	RV-10	VH-XTE		Perm
VANS Aircraft	RV-14	VH-JBR		Perm
Cirrus Aircraft	SR-20	VH-SRL		Perm
VANS AIRCRAFT	RV-6	VH-HRV		Perm
Cessna Aircraft	C-152	VH-BUQ		Perm
Cessna Aircraft	C-150 M Aerobat	VH-MFJ		Perm
Cessna Aircraft	C-172RG	VH-BAY		Perm

ADVANCED AVIATION TRAINING

Form 4B13 Aeroplane Landings Areas (ALA) Report Form

ALA Survey Report

Name of ALA :		
Location:	BRG & DIST:	LAT/LONG:
Owner information:		TELEPHONE: EMAIL:
Facilities	TELEPHONE MOBILE PHONE RECEPTION FUEL SHELTER PAVED ROAD	
Nearest town or city:		
Landing Area Diagram	N LENGTH: DIRECTION: WIDTH: SLOPE:	

Elevation:		Lighting	YES / NO
Surface		Markings:	
Obstructions:		Identification Features:	
Comments:			
Reported by (Pilot):		Date of report:	

Approved for company OPS	SIGNED:	Date:	

ADVANCED AVIATION TRAINING

Form 4B15 Aircraft Journey Log

Date	Instructor	Student	Route	VDO Out	VDO In	Total	Tacho Out	Tacho In	Total	Fuel start	Fuel end	Fuel added

VOLUME 5 TRAINING SYLLABUSES

5.1 GUIDE TO USE OF FLIGHT TRAINING SYLLABUSES

5.1.1 SYLLABUS DOCUMENTATION

For each approved course of Part 141 flight training, syllabus documentation includes:

1. A planning matrix (a syllabus design tool for mapping Part 61 MOS competencies into individual flight lessons for training and assessment)
2. A syllabus introduction (providing general information, requirements and contingencies relating to the particular syllabus)
3. A flight training and theory examination summary (a list of flight training lessons and theory exams in planned sequence)
4. A lesson plan and training record for each flight (a single document providing a lesson overview, briefing topics, underpinning knowledge items, performance criteria and a means for recording training and assessment outcomes).

5.1.2 TRAINING AND ASSESSMENT PLAN

5.1.2.1 TRAINING PLAN

The training plan for each course is set out in the planning matrix, flight training and theory examination summary and syllabus introduction.

Each syllabus is planned to ensure students receive training in the units of competency mentioned in the Part 61 MOS for the licence, rating or endorsement in a structured manner.

The briefing and flight training hours represented in each syllabus are recommended training times, however in practice these may vary (for example due to student progress, continuity of training, weather conditions, aerodrome traffic etc.).

5.1.2.2 COMPETENCY GRADING SCALE - PERFORMANCE STANDARDS

Advanced Aviation Training uses a numeric competency grading scale. The grading scale is applied during course development to represent proposed progress under the training plan, and ensure certain items are assessed prior to significant milestones (such as the first solo flight). It then provides a benchmark against which a student’s actual progress may be monitored and recorded.

The grading scale is set out in the ‘performance standard’ table below:

Performance Standard

3	2	1
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

Performance standard 3 represents the introduction of the specified performance criteria via instructor demonstration, followed by guided student practice. The student demonstrates a basic level of ability.

Performance standard 2 represents the ability to safely conduct a flight for the purposes of practising a sequence or sequences solo. For sequences where solo practice is not required or is not permitted, performance standard 2 is used to represent a developing level of proficiency.

Note: The word "safe" used in performance standard 2 means that the student may achieve the required standard on the majority, but not necessarily on all occasions. The student must be able to recognise a situation where the desired outcome of a manoeuvre may be in doubt and take appropriate corrective action to recover.

Performance standard 1 represents proficiency to the standard required for the issue of the qualification, and therefore constitutes a ‘competent’ assessment. Assessment should be based on the technique used by the student, as well as the ability to perform manoeuvres within the tolerances specified in schedule 8 of the Part 61 MOS. Sound judgement and decision making should be displayed.

Note: Technique involves smooth and accurate control application when adjusting power, attitude, trim and balance in a timely and coordinated fashion, whilst following correct procedures. On some occasions, flight conditions (e.g. turbulence) may be such that even though the student's technique is sound, the aircraft may deviate outside specified tolerances for short periods. On these occasions the assessment of technique should be the determining factor.

5.1.2.3 ASSESSMENT PLAN

A student may be deemed competent to conduct a solo flight, be recommended for a flight test or issued a qualification when competency is demonstrated on at least two occasions (each occasion being on a separate flight).

Pre-solo and end of course assessments have been planned on this basis.

End of course assessments take into account all of the units of competency mentioned in the Part 61 MOS for the licence, rating or endorsement.

5.1.2.4 VARIATIONS TO THE TRAINING AND ASSSESSMENT PLAN

Lesson sequence

Where variations to the planned lesson sequence are permissible, these are noted in the syllabus introduction.

Any other lesson sequencing deviations or lesson content changes are to be made only with the prior approval of the HOO or the nominated supervising instructor. Approval for changes shall be in the form of a notation made in the training record by the HOO or the nominated supervising instructor.

Time to achieve competency

The accumulation of the planned hours specified in a syllabus does not necessarily guarantee achievement of the required standard. The achievement of competency will vary dependent upon individual training and assessment outcomes.

Students may require flight time in excess of planned syllabus totals, or may achieve competency ahead of the documented schedule.

Where accelerated student learning occurs, significant deviations from the planned syllabus durations are to be clearly notated in the student's training records, including an approval by the HOO after considering any relevant Part 61 minimum experience requirements.

For instructions regarding the management of underperforming students, refer to section 3.4.2.4.

Note: When adjustments to the planned syllabus hours are made, instructors and the HOO must ensure that the CASR Part 61 minimum aeronautical experience requirements are met.

5.1.3 USING THE SYLLABUS DOCUMENTS

5.1.3.1 PLANNING MATRIX

It is not a requirement that a copy of the planning matrix be retained on a student's training file.

5.1.3.2 FLIGHT TRAINING AND THEORY EXAMINATION SUMMARY

A copy of the flight training and theory examination summary may be provided to each student at commencement of training. A copy should be retained on the student's file.

5.1.3.3 SYLLABUS INTRODUCTION

The syllabus introduction contains specific requirements to be met during training (for example prior to first solo). It must be read in conjunction with Parts 61 and 141 and Advanced Aviation Training's operations manual.

5.1.3.4 LESSON PLAN AND TRAINING RECORD FORM

Training records are to be maintained for all students.

The lesson plan and training record form is to be completed immediately following the debriefing and retained on the student's training file. The record should contain sufficient information to ensure that the student's current competencies, any areas of deficiency and recommendations for the next flight are immediately evident.

Instructions for the use of the lesson plan and training record form are summarised below.

Flight details

Enter the date, student, instructor and other flight details as prompted.

The flight number should normally be recorded as '1', for example, the RPL stalling lesson is to be recorded as flight number 'RPL (A) 5.1'.

If a lesson is repeated it is to be numbered sequentially, for example a repeated RPL stalling lesson would be assigned flight number 'RPL (A) 5.2'.

Lesson overview

Refer to the overview for a summary of lesson content. For detailed practical flight training content, refer to the 'flight training' section of the form.

Pre-flight knowledge

Students are to be thoroughly briefed prior to each flight lesson. The pre-flight knowledge section contains:

- suggested briefing duration
- long briefing topics (briefing content should not necessarily be limited to these items. Instructors should refer to their briefing notes for full briefing content)
- underpinning knowledge items, including those relating to HF & NTS (instructors should

- introduce, review or assess underpinning knowledge to a level of detail that is applicable to the stage of training. Some adjustments to suggested content may be necessary to meet the requirements and conditions during the particular flight)
- a pre-flight briefing checklist.

The instructor is to sign off at the foot of the pre-flight knowledge section to confirm the pre-flight briefings have been carried out and the underpinning knowledge items addressed.

Note: Underpinning knowledge is assessed via oral questioning, and also through in-house written examinations such as the pre-solo and pre-area solo examinations.

Performance standards

The table containing the performance standard grading scale is included in each lesson plan and training record.

Flight training

The flight training section sets out the suggested flight time and performance criteria to be covered during the lesson.

The performance standards 3, 2 or 1 appearing in the 'performance standard required' column represent target student progress under the training and assessment plan. They also indicate the following instructor and student actions:

Performance Standard	Instructor	Student
3	Demonstrate Direct Monitor	Observe Perform tasks with guidance Perform tasks with monitoring
2	Assess	Perform tasks
1	Assess	Perform tasks

Instructional elements which have already been introduced or assessed may appear in subsequent lessons for the purposes of student consolidation. In this situation the performance standard required is the same as that on the previous occasion. The instructor should monitor the student as they perform the tasks to ensure the previous standard is maintained, providing guidance if required.

Performance standard 3, 2 or 1 is to be entered in the 'performance standard achieved' column to represent the student's actual performance during the flight. In the interests of reducing repetitive data entry by the instructor, if progress matches that in the 'performance standard required' column, no entry is necessary (i.e. a 'nil entry' indicates the standard achieved is the same as that required).

When making entries in the 'performance standard achieved' column:

- Enter the standard achieved (if different to that required).
- If the standard achieved is lower than that required, carry the relevant performance criteria over into the next lesson by writing them in the 'consolidation and/or remedial training' box of the subsequent lesson's training record. The items are to be addressed during the next lesson.
- Performance criteria which were not able to be introduced during the lesson should be marked as 'NI' (not introduced). Enter the relevant performance criteria in the 'consolidation and/or remedial training' box of the training record for the next lesson. This will ensure these items are captured during future training.
- Performance criteria which were not able to be assessed should be marked as 'NA' (not assessed). Enter the relevant performance criteria in the 'consolidation and/or remedial training' box of the training record for the next lesson. This will ensure the items are captured for future assessment.

- If a student is progressing ahead of the syllabus schedule and assessments are conducted in advance (i.e. for performance criteria not included in the lesson plan and training record), record the assessed performance criteria and standard achieved on the ‘accelerated competency’ form. Attach this form to the lesson plan and training record for the lesson in which the early assessment was made.

Note: Competency must be demonstrated by the student on two separate flights.

In lesson plan and training record documents, the first assessment to a higher performance standard lists both the element and relevant performance criteria.

Only the element is listed for the second assessment; however the instructor must ensure the assessment is conducted against the same performance criteria.

Debriefing

Students are to be thoroughly debriefed following each flight lesson. A debriefing checklist is provided in each lesson plan and training record.

Comments and outcome

Instructor comments and recommendations for the next lesson should be entered into the ‘comments and outcome’ box.

Instructor and student sign-off

On completion of the lesson the instructor and student are to sign at the end of the form, as an acknowledgment that the student has been appropriately briefed, debriefed and the lesson was conducted in accordance with the training record. The student’s signature is also an acknowledgement of their agreement with the comments and recommendations for future training. The student will be provided with a copy of the record IAW 3.5.3

5.2 RPL SYLLABUS

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

FLIGHT TRAINING & THEORY EXAMINATION SUMMARY

LESSON #	LESSON DESCRIPTION	DUAL	SOLO	PROG DUAL	PROG SOLO	IF	PROG IF	TOTAL PROG FLIGHT TIME
RPL(A)1	Effects of Controls	1.0		1.0				1.0
RPL(A)2	Straight & Level	1.0		2.0				2.0
RPL(A)3	Climbing & Descending	1.0		3.0				3.0
RPL(A)4	Turning	1.0		4.0				4.0
RPL(A)5	Stalling	1.0		5.0				5.0
RPL(A)6	Circuit Introduction	1.0		6.0				6.0
RPL(A)7	Circuits	1.0		7.0				7.0
RPL(A)8	Circuits – Flapless & Missed Approach	1.0		8.0				8.0
RPL(A)9	Circuit Emergencies	1.0		9.0				9.0
Pre-solo examination								
RPL(A)10	Circuits - Pre-solo assessment	0.8		9.8				9.8
RPL(A)11	Circuit – First solo		0.3		0.3			10.1
RPL(A)12	Circuit Consolidation	0.5		10.3				10.6
RPL(A)13	Circuits – solo		0.7		1.0			11.2
RPL(A)14	Circuit Consolidation	0.5		10.8				11.8
RPL(A)15	Circuits – solo		1.0		2.0			12.8
RPL(A)16	Advanced Stalling	1.0		11.8				13.8
RPL(A)17	Forced Landings	1.0		12.8				14.8
RPL(A)18	Steep Turns	1.0		13.8				15.8
RPL(A)19	Crosswind Circuits	1.0		14.8				16.8
Pre-area solo examination								
RPL(A)20	Pre-training area solo assessment	1.0		15.8				17.8
RPL(A)21	First training area solo		1.0		3.0			18.8
RPL(A)22	Circuits – Short Field t/o & Landing	1.0		16.8				19.8
RPL(A)23	Consolidation	1.0		17.8				20.8
RPL(A)24	Precautionary Search & Landing	1.0		18.8				21.8
RPL(A)25	Solo Consolidation		1.0		4.0			22.8
RPL(A)26	Basic Instrument Flight	1.0		19.8		0.6	0.6	23.8
RPL(A)27	Consolidation	1.0		20.8		0.2	0.8	24.8
RPL(A)28	Consolidation	1.4		22.2		0.2	1.0	26.2
RPLA Aeronautical knowledge examination ***RPL Flight radio operator examination***								
RPL(A)29	Solo Consolidation		1.0		5.0			27.2
RPL(A)30	Pre-licence assessment	1.4		23.6		0.2	1.2	**28.6**
RPL Aeroplane Category Rating flight test		**1.4**		**25.0**	**5.0**	**0.2**	**1.4**	**30.0**

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Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

SYLLABUS INTRODUCTION

Overview

This syllabus describes the flight training and assessment activities to be undertaken during the recreational pilot licence – aeroplane category rating and flight radio endorsement training course. The aim of the course is to provide the student with the required skills, knowledge and attitudes to safely exercise the privileges of the RPL (A) and flight radio endorsement.

Flight training lessons include general handling, basic and advanced manoeuvres, circuit operations, basic instrument flight, procedures in the event of abnormal situations and human factors and non-technical skills awareness and application.

The privileges and limitations of the recreational pilot licence – aeroplane category rating and flight radio endorsement are defined in CASR Part 61 Subpart 61.G.

Competency Standards

Practical flight competency standards

Flight training is provided to allow the student to meet the prescribed Part 61 MOS practical flight competency standards. Student performance is assessed against these flight competency standards. The standards required for the completion of this course and the issue of the licence and endorsement are captured by the following units of competency:

Unit code	Unit of competency
C1	Communicating in the aviation environment
C2	Perform pre- and post-flight actions and procedures
C3	Operate aeronautical radio
C4	Manage fuel
C5	Manage passengers and cargo
NTS1	Non-technical skills 1
NTS2	Non-technical skills 2
A1	Control aeroplane on the ground
A2	Take-off aeroplane
A3	Control aeroplane in normal flight
A4	Land aeroplane
A5	Aeroplane advanced manoeuvres
A6	Manage abnormal situations – single-engine aeroplanes
IFF	Instrument flight full panel

Aeronautical knowledge standards

The knowledge required to meet the aeronautical knowledge standards prescribed by the Part 61 MOS may be attained through student self-study or more formal training. Theory topics and content are described in the following units of knowledge:

Unit code	Unit of knowledge
BAKC	Basic aeronautical knowledge
RFRC	RPL Flight rules and air law
RMTC	RPL Meteorology
PHFC	PPL Human factors
RBKA	Basic aeronautical knowledge – aeroplane
RARO	Aeronautical radio operation

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

SYLLABUS INTRODUCTION

Course prerequisites

There are no mandatory qualifications, aeronautical experience or examination passes required before commencing the course.

Minimum age requirements apply to solo flight (15 years) and when making application for the recreational pilot licence (16 years).

Students should be proficient in the English language. English language proficiency assessments are required prior to first solo and for the grant of the flight radio endorsement.

Course duration

The course may be undertaken on a part-time or full-time basis.

The syllabus is based on a total flight time of 30 hours inclusive of the RPL aeroplane category flight test; however the total flight time required to achieve competency will vary from student to student.

Course resources

Flight training may be undertaken in the C152

Other resources include a model aeroplane, cockpit cut-out, instrument flight hood or foggles, navigation charts.

Syllabus documentation

Syllabus documentation includes:

- a planning matrix
- a flight training and theory examination summary
- a lesson plan and training record for each flight.

Refer to Part 5A/Section 5.1* of the operations manual for a guide to the use of the syllabus documents.

Lesson sequence and allowable variations

The flight training and theory examination summary provides the sequence of flight training lessons.

If required (e.g. if weather conditions are not suitable for successful lesson outcomes), adjustments may be made to the lesson sequence as follows:

- Circuits (lesson #6) may be conducted prior to stalling (lesson#5).
- Advanced stalling, forced landings, steep turns and crosswind circuits (lessons 16, 17, 18 & 19) may be conducted out of the planned sequence, provided all indicated competencies are met for the phase of training prior to the first training area solo.

Any variations to the lesson sequence which are not noted above are only to be made with the prior approval of the HOO or authorising instructor.

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

SYLLABUS INTRODUCTION

Solo flight

The course includes a minimum of 5 hours of solo flight time.

Prior to authorising a student to conduct a solo flight, instructors must ensure the requirements of section 3B1.1/3.4.1.1* are met.

Students who have not undertaken a dual check within the previous 30 days, or whose consecutive solo time would exceed 3 hours as a result of the solo flight, must undertake a dual check prior to the flight *(CASR 61.115 & CASA EX78/15).*

Instructor requirements

First solo flight

The pre- solo circuit lesson (lesson #10) must be conducted by a grade 1 or 2 instructor. The first solo flight must be authorised by an instructor who holds a grade 1 or 2 training endorsement.

Aeronautical knowledge examinations and language assessments

Successful completion of the following examinations and assessments are required during the course:

Prior to first solo - Pre-solo examination and general English language assessment

Prior to first area solo - Pre-area solo examination

Prior to flight test recommendation - RPLA aeronautical knowledge examination

Prior to the RPL flight radio endorsement being granted -
RPL flight radio operator examination and aviation English language proficiency assessment

The pass mark for each examination is 70%. The pre-solo, pre-area solo and flight radio operator examinations are set by Advanced Aviation Training

The flight training and theory examination summary sets out the recommended sequence for aeronautical knowledge examinations and flight lessons. To avoid training delays, instructors should ensure students complete the examinations in this sequence.

Aeronautical knowledge examinations are conducted in the ground examination facility. Refer to Part 3E/Section 3.7* for further information regarding the conduct of these exams.

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

SYLLABUS INTRODUCTION

Aeronautical knowledge examinations and language assessments
Knowledge Deficiency Reports If a student passes the RPLA aeronautical knowledge or RPL flight radio operator examination with a score of less than 100%, a report shall be prepared about the competency standards in which the student's knowledge is deficient (a knowledge deficiency report). Following further self-study, an instructor holding a grade 1 or 2 training endorsement must orally assess the student's knowledge to ensure the deficiencies noted on the knowledge deficiency report have been addressed (i.e. knowledge corrected to 100%). A copy of the knowledge deficiency report for the RPLA aeronautical knowledge examination must be provided to the flight examiner who is to conduct the student's flight test. (For pre-solo and pre-area solo examinations a KDR is not required, however areas of deficiency are to be re-assessed verbally by the instructor to ensure the student holds the required underpinning knowledge, prior to the student conducting the solo flight).
Flight test
Upon successful completion of the course students must pass the RPL aeroplane category flight test, prior to making application for the recreational pilot licence and aeroplane category rating. The test is conducted by a flight examiner and involves a ground component and a flight of approximately 1.4 hours (1.2 hours airborne time). Flight test standards are contained in Schedule 5 App G.1 to the Part 61 MOS. Manoeuvres must be performed within the flight tolerances specified in table 1, Section 1 of Schedule 8 of the MOS. For flight test procedures and information regarding the booking of flight tests, refer to section 3F1/3.8.1*.
Document control and access information
This syllabus is a managed document and is uncontrolled if printed. Refer to the version number and date in the footer to ensure that the current syllabus is being referenced. It is available in electronic format. Paper copies are also provided for use by instructors and students. Syllabus documentation is to be read in conjunction Advanced Aviation Training's operations manual, CASR Parts 61, 141 and the Part 61 Manual of Standards.

*MAAT manual reference

Planning Matrix — Recreational Pilot Licence - Aeroplane (including Flight Radio Endorsement) v1.2

Performance Standards
3 = Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue.
2 = Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision *.
1 = Achieves competency to the standard required for qualification issue.

**Solo operations for authorised sequences only*

	1 Effects of Controls	2 Straight and Level	3 Climbing and Descending	4 Turning	5 Stalling	6 Consolidation and Circuits	7 Circuits	8 Flapless & Missed Approaches	9 Circuit Emergencies	10 Circuits – Pre-solo	11 Solo Circuit	12 Circuit Consolidation	13 Solo Circuits	14 Circuit Consolidation	15 Solo Circuits	16 Advanced Stalling	17 Forced Landings	18 Steep Turns	19 Crosswind Circuits*	20 Pre-Training Area Solo	21 First Training Area Solo	22 Short Field T/O & Landing	23 Consolidation	24 Precautionary Search	25 Solo Consolidation	26 Basic Instrument Flight	27 Consolidation	28 Consolidation	29 Solo Consolidation	30 Pre-Licence	31 Flight Test	Total hours
Dual day	1	1	1	1	1	1	1	1	1	0.8		0.5		0.5		1	1	1	1	1		1	1	1		1	1	1.4		1.4	1.4	25.0
Solo day											0.3		0.7		1						1				1				1			5.0
Instrument flight time																										0.6	0.2	0.2		0.2	0.2	(1.4 IF)
Training phases	Phase 1											Phase 2										Phase 3										30.0
Aeronautical knowledge examinations									Pre-solo											Pre-area solo										RPLA		
Units, Elements and Performance Criteria																																
C1 Communicating in the aviation environment																																
C1.1 Communicating face-to-face																																
(a) pronounces words clearly, using an accent that does not cause difficulties in understanding		3		2	2																					1	1					
(b) conveys information in clearly structured sentences without confusion or ambiguity		3		2	2																					1	1					
(c) uses an extensive vocabulary to accurately communicate on general and technical topics, without excessive use of jargon, slang or colloquial language		3		2	2																					1	1					
(d) speaks fluently without long pauses, repetition or excessive false starts		3		2	2																					1	1					
(e) responds to communications with actions that demonstrate that the information has been received and understood		3		2	2																					1	1					
(f) exchanges information clearly in a variety of situations with both expert and non-expert English speakers while giving and receiving timely and appropriate responses		3		2	2																					1	1					
(g) uses appropriate techniques to validate communications		3		2	2																					1	1					
C1.2 Operational communication using an aeronautical radio																																
(a) maintain effective communication with others on operational matters						3			2	2																1	1					
(b) communicate effectively in unfamiliar, stressful or non-standard situations																3			2	2						1	1					
(c) apply the phonetic alphabet				3					2	2																1	1					
(d) transmit numbers				3					2	2																1	1					
(e) make appropriate transmissions using standard aviation phraseology				3					2	2																1	1					
(f) use plain English effectively when standard phraseology is inadequate				3					2	2																1	1					
(g) receive appropriate responses to transmissions				3					2	2																1	1					
(h) respond to transmissions and take appropriate action						3			2	2																1	1					
(i) recognise and manage communication errors and misunderstandings effectively						3			2	2																1	1					
(j) seek clarification in the time available if a message is unclear or uncertainty exists						3			2	2																1	1					
(k) react appropriately to a variety of regional accents						3			2	2																1	1					
(l) communicate effectively in unexpected, stressful or non-standard situations using standard phraseology or plain English																3			2	2						1	1					
C2 Perform pre- and post-flight actions and procedures																																
C2.1 Pre-flight actions and procedures																																
(a) complete all required pre-flight administration documentation	3								2	2																1	1					
(b) obtain, interpret and apply information contained in the required pre-flight operational documentation, including the following:																																
(i) minimum equipment list (MEL)																						3	3	2		1	1					
(ii) maintenance release					3				2	2																1	1					
(iii) weather forecasts																3			2	2						1	1					
(iv) local observations					3														2	2						1	1					
(v) Notice to Airmen (NOTAM)																						3	3	2		1	1					
(vi) global navigation satellite system (GNSS) receiver autonomous integrity monitoring (RAIM) information																						3	3	2		1	1					
(vii) En Route Supplement Australia (ERSA)																						3	3	2		1	1					
(viii) Aeronautical Information Package (AIP)																						3	3	2		1	1					
(c) identify special aerodrome procedures					3	3			2	2																1	1					
(d) identify all relevant radio and navigation aid facilities to be used during the flight (if applicable)																3										1	1					
(e) determine the suitability of the current and forecast weather conditions for the proposed flight					3				2	2						3										1	1					
(f) using the aircraft documents, calculate the following for a given set of environmental and operational conditions:																																
(i) weight and balance																	3	3				2				1	1					
(iii) take-off and landing performance																	3	3				2				1	1					
(iv) fuel requirements																	3	3				2				1	1					
(g) determine whether the aircraft is serviceable for the proposed flight					3				2	2																1	1					
C2.2 Perform pre-flight inspection																																
(a) identify and secure equipment and documentation that					3				2	2																1	1					

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Planning Matrix **Recreational Pilot Licence - Aeroplane (including Flight Radio Endorsement) v1.2**

Performance Standards
3 = Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue.
2 = Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision *.
1 = Achieves competency to the standard required for qualification issue.

**Solo operations for authorised sequences only*

		1 Effects of Controls	2 Straight and Level	3 Climbing and Descending	4 Turning	5 Stalling	6 Consolidation and Circuits	7 Circuits	8 Flapless & Missed Approaches	9 Circuit Emergencies	10 Circuits – Pre-solo	11 Solo Circuit	12 Circuit Consolidation	13 Solo Circuits	14 Circuit Consolidation	15 Solo Circuits	16 Advanced Stalling	17 Forced Landings	18 Steep Turns	19 Crosswind Circuits	20 Pre-Training Area Solo	21 First Training Area Solo	22 Short Field T/O & Landing	23 Consolidation	24 Precautionary Search	25 Solo Consolidation	26 Basic Instrument Flight	27 Consolidation	28 Consolidation	29 Solo Consolidation	30 Pre-Licence	31 Flight Test	**Total hours**
	Dual day	1	1	1	1	1	1	1	1	1	0.8		0.5		0.5		1	1	1	1	1		1	1	1		1	1	1.4		1.4	1.4	25.0
	Solo day											0.3		0.7		1						1				1				1			5.0
	Instrument flight time																										0.6	0.2	0.2		0.2	0.2	(1.4 IF)
	Training phases	Phase 1											Phase 2										Phase 3										**30.0**
	Aeronautical knowledge examinations	Pre-solo										Pre-area solo												RPLA									
	is required for the flight																																
(b)	complete an internal and external check of the aircraft	3								2	2																1	1					
(c)	identify all defects or damage to the aircraft					3				2	2																1	1					
(d)	report to, and seek advice from, qualified personnel to determine the action required in relation to any identified defects or damage																							3	3		1	1					
(e)	ensure all aircraft locking and securing devices, covers and bungs are removed and stowed securely	3								2	2																1	1					
(f)	certify the aircraft flight technical log entering any defects or endorsements to permissible unserviceabilities as appropriate																							3	3		1	1					
(g)	complete and certify the daily inspection (if authorised to do so)																							3	3		1	1					
C2.3	**Post-flight actions and procedures**																																
(a)	shut down aircraft	3					2	2																			1	1					
(b)	conduct post-flight inspection and secure the aircraft (if applicable)	3					2	2																			1	1					
(c)	complete all required post-flight administration documentation	3					2	2																			1	1					
C3	**Operate aeronautical radio ***																																
C3.1	**Operate radio equipment**																																
(a)	confirm serviceability of radio equipment							3		2	2																1	1					
(b)	conduct transmission and receipt of radio communications using appropriate procedures and phraseology				3					2	2																1	1					
(c)	maintain a listening watch and respond appropriately to applicable transmissions						3			2	2																1	1					
(d)	conduct appropriate emergency and urgency transmissions									2	2																1	1					
C3.2	**Manage R/T equipment malfunctions**																																
(a)	perform radio failure procedures							3											2		2								1		1		
(b)	use fault finding procedures and perform corrective actions							3											2		2								1		1		
C3.3	**Operate transponder**																																
(a)	operate a transponder during normal, abnormal and emergency operations				3					2	2							2									1	1					
(b)	recall transponder emergency codes																	2									1	1					
C4	**Manage fuel**																																
C4.1	**Plan fuel requirements**																																
(a)	determine the required fuel reserves			3						2	2																	1	1				
(b)	determine the quantity of fuel required taking into account operational requirements and relevant abnormal or emergency conditions and contingencies																	3										1	1				
(c)	determine the total fuel required for the flight			3						2	2																	1	1				
C4.2	**Manage fuel system**																																
(a)	verify fuel quantity on-board aircraft prior to flight using two independent methods			3						2	2																	1	1				
(b)	ensure the fuel caps are secured			3						2	2																	1	1				
(c)	perform fuel quality check prior to flight			3						2	2																	1	1				
(d)	ensure fuel drain cocks are closed			3						2	2																	1	1				
(e)	monitor fuel usage during the flight					3				2	2																	1	1				
(f)	accurately maintain fuel log																							3	3			1	1				
(g)	calculate and state endurance at any point during flight																							3	3			1	1				
(h)	perform fuel tank changes correctly					3				2	2																	1	1				
(i)	maintain fuel load within aircraft limits					3				2	2																	1	1				
(j)	operate the fuel cross-feed system correctly (if fitted)																	3										1	1				
(k)	operate fuel pumps and engine controls correctly					3				2	2																	1	1				
(m)	configure the aircraft correctly to achieve best endurance performance and correctly calculate the revised operational endurance																							3	3			1	1				
C4.3	**Refuel aircraft**																																
(a)	identify the correct type of fuel to be used				3													3		2								1	1				
(b)	ensure aircraft is earthed prior to refuelling and defueling operations				3													3		2								1	1				
(c)	correctly load and unload fuel				3													3		2								1	1				
(d)	ensure required fuel quantity is loaded				3													3		2								1	1				
(e)	ensure fuel caps are closed and secured after fuelling operations				3													3		2								1	1				
(f)	perform fuel quality checks				3													3		2								1	1				
C5	**Manage passengers and cargo**																																
C5.1	**Manage passengers**																																
(a)	supervise passenger safety																	3											1		1		

2

Planning Matrix   Recreational Pilot Licence - Aeroplane (including Flight Radio Endorsement) v1.2

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Solo operations for authorised sequences only

		1 Effects of Controls	2 Straight and Level	3 Climbing and Descending	4 Turning	5 Stalling	6 Consolidation and Circuits	7 Circuits	8 Flapless & Missed Approaches	9 Circuit Emergencies	10 Circuits – Pre-solo	11 Solo Circuit	12 Circuit Consolidation	13 Solo Circuits	14 Circuit Consolidation	15 Solo Circuits	16 Advanced Stalling	17 Forced Landings	18 Steep Turns	19 Crosswind Circuits	20 Pre-Training Area Solo	21 First Training Area Solo	22 Short Field T/O & Landing	23 Consolidation	24 Precautionary Search	25 Solo Consolidation	26 Basic Instrument Flight	27 Consolidation	28 Consolidation	29 Solo Consolidation	30 Pre-Licence	31 Flight Test	**Total hours**
	Dual day	1	1	1	1	1	1	1	1	1	0.8		0.5		0.5		1	1	1	1	1		1	1	1		1	1	1.4		1.4	1.4	25.0
	Solo day											0.3		0.7		1						1				1				1			5.0
	Instrument flight time																										0.6	0.2	0.2		0.2	0.2	(1.4 IF)
	Training phases	Phase 1											Phase 2										Phase 3										**30.0**
	Aeronautical knowledge examinations	Pre-solo									Pre-area solo											RPLA											
(b)	encourage passengers to participate in and contribute to the safe outcome of the flight																	3											1		1		
(c)	conduct pre-flight passenger safety briefing																	3											1		1		
(d)	ensure passengers are aware of, and avoid interference with, flight and systems controls																	3											1		1		
(e)	ensure passengers are aware of, and comply with, the use of seat harnesses																	3											1		1		
(f)	ensure passengers are aware of the use of escape hatches, exits and emergency equipment on board the aircraft																	3											1		1		
(g)	manage passenger safety in the event of abnormal or in-flight emergency situations																	3											1		1		
C5.2	**Aid and assist passengers**																																
(a)	establish and maintain clear communications with passengers																	3											1		1		
(b)	assist with passenger comfort both when airside and in flight																	3											1		1		
C5.3	**Manage cargo**																																
(a)	manage loading, unloading and security of cargo during flight operations																							3	3				1		1		
(b)	identify dangerous goods and apply procedures to ensure safety and security																							3	3				1		1		
NTS1	**Non-technical skills 1**																																
NTS1.1	**Maintain effective lookout**																																
(a)	maintain traffic separation using a systematic visual scan technique at a rate determined by traffic density, visibility and terrain	3						2	2											1	1												
(b)	maintain radio listening watch and interpret transmissions to determine traffic location and intentions						3	2	2											1	1												
(c)	perform airspace-cleared procedure before commencing any manoeuvre			3				2	2											1	1												
NTS1.2	**Maintain situational awareness**																																
(a)	monitor all aircraft systems using a systematic scan technique					3				2	2																		1		1		
(b)	collect information to facilitate ongoing system management					3				2	2																		1		1		
(c)	monitor flight environment for deviations from planned operations					3				2	2																		1		1		
(d)	collect flight environment information to update planned operations					3				2	2																		1		1		
NTS1.3	**Assess situations and make decisions**																																
(a)	identify problems								3	2	2																		1		1		
(b)	analyse problems								3	2	2																		1		1		
(c)	identify solutions								3	2	2																		1		1		
(d)	assess solutions and risks								3	2	2																		1		1		
(e)	decide on a course of action								3	2	2																		1		1		
(f)	communicate plans of action (if appropriate)								3	2	2																		1		1		
(g)	allocate tasks for action (if appropriate)								3	2	2																		1		1		
(h)	take actions to achieve optimum outcomes for the operation								3	2	2																		1		1		
(i)	monitor progress against plan								3	2	2																		1		1		
(j)	re-evaluate plan to achieve optimum outcomes								3	2	2																		1		1		
NTS1.4	**Set priorities and manage tasks**																																
(a)	organise workload and priorities to ensure optimum outcome of the flight			3						2	2																		1		1		
(b)	plan events and tasks to occur sequentially						3			2	2																		1		1		
(c)	anticipate events and tasks to ensure sufficient opportunity for completion						3			2	2																		1		1		
(d)	use technology to reduce workload and improve cognitive and manipulative activities																	3											1		1		
NTS1.5	**Maintain effective communications and interpersonal relationships**																																
(a)	establish and maintain effective and efficient communications and interpersonal relationships with all stakeholders to ensure the optimum outcome of the flight																	3		2	2								1		1		
(b)	define and explain objectives to stakeholders																	3		2	2								1		1		
(c)	demonstrate a level of assertiveness that ensures the optimum completion of the flight																	3		2	2								1		1		
NTS2	**Non-technical skills 2**																																
NTS2.1	**Recognise and manage threats**																																
(a)	identify relevant environmental or operational threats that are likely to affect the safety of the flight					3				2	2																		1		1		
(b)	identify when competing priorities and demands may								3	2	2																		1		1		

3

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		1 Effects of Controls	2 Straight and Level	3 Climbing and Descending	4 Turning	5 Stalling	6 Consolidation and Circuits	7 Circuits	8 Flapless & Missed Approaches	9 Circuit Emergencies	10 Circuits – Pre-solo	11 Solo Circuit	12 Circuit Consolidation	13 Solo Circuits	14 Circuit Consolidation	15 Solo Circuits	16 Advanced Stalling	17 Forced Landings	18 Steep Turns	19 Crosswind Circuits*	20 Pre-Training Area Solo	21 First Training Area Solo	22 Short Field T/O & Landing	23 Consolidation	24 Precautionary Search	25 Solo Consolidation	26 Basic Instrument Flight	27 Consolidation	28 Consolidation	29 Solo Consolidation	30 Pre-Licence	31 Flight Test	Total hours
	Dual day	1	1	1	1	1	1	1	1	1	0.8		0.5		0.5		1	1	1	1	1		1	1	1		1	1	1.4		1.4	1.4	25.0
	Solo day											0.3		0.7		1						1				1				1			5.0
	Instrument flight time																										0.6	0.2	0.2		0.2	0.2	(1.4 IF)
	Training phases	Phase 1										Phase 2											Phase 3										30.0
	Aeronautical knowledge examinations	Pre-solo									Pre-area solo											RPLA											
	represent a threat to the safety of the flight																																
(c)	develop and implement countermeasures to manage threats								3	2	2																		1		1		
(d)	monitor and assess flight progress to ensure a safe outcome, or modify actions when a safe outcome is not assured					3				2	2																		1		1		
NTS2.2	**Recognise and manage errors**																																
(a)	apply checklists and standard operating procedures to prevent aircraft handling, procedural or communication errors					3				2	2																		1		1		
(b)	identify committed errors before safety is affected or the aircraft enters an undesired state					3				2	2																		1		1		
(c)	monitor the following to collect and analyse information to identify potential or actual errors:																	3											1		1		
	(i) aircraft systems using a systematic scan technique																	3											1		1		
	(ii) the flight environment																	3											1		1		
	(iii) other crew																	3											1		1		
(d)	implement countermeasures to prevent errors or take action in the time available to correct errors before the aircraft enters an undesired state					3				2	2																		1		1		
NTS2.3	**Recognise and manage undesired aircraft state**																																
(a)	recognise an undesired aircraft state					3				2	2																		1		1		
(b)	prioritise tasks to ensure an undesired aircraft state is managed effectively					3				2	2																		1		1		
(c)	apply corrective actions to recover an undesired aircraft state in a safe and timely manner					3				2	2																		1		1		
A1	**Control aeroplane on the ground**																																
A1.1	**Start and stop engine**																																
(a)	perform engine start and after start actions	3								2	2																1	1					
(b)	perform engine shutdown and after shutdown actions	3								2	2																1	1					
(c)	manage engine start and shutdown malfunctions and emergencies					3				3								2	2								1	1					
(d)	considers ground surface in relation to contamination and propeller care during engine start and stop activities	3								2	2																1	1					
A1.2	**Taxi aeroplane**																																
(a)	use aerodrome or landing area charts to taxi aircraft																	3									1	1					
(b)	comply with taxiway and other aerodrome markings, right-of-way rules and ATC or marshalling instructions when applicable	3								2	2																1	1					
(c)	perform applicable taxi checks, including the following:																																
	(i) brakes and steering function normally and take appropriate action in the event of a malfunction						3			2	2																1	1					
	(ii) instruments for correct readings																	3									1	1					
	(iii) altimeter setting						3			2	2																1	1					
(d)	maintain safe taxi speed and control of the aircraft	3								2	2																1	1					
(e)	maintain safe spacing from other aircraft, obstructions, and persons	3								2	2																1	1					
(f)	taxi the aeroplane along the centre of the taxiway	3								2	2																1	1					
(g)	avoid causing a hazard to other aircraft, objects or persons	3								2	2																1	1					
(h)	correct handling techniques are applied to take into account wind from all four quadrants						3			2	2																1	1					
(i)	correctly manage the engine during taxi manoeuvres	3								2	2																1	1					
A2	**Take-off aeroplane**																																
A2.1	**Carry out pre take-off procedures**																																
(a)	correctly identify critical airspeeds, configurations, and emergency and abnormal procedures for normal and crosswind take-offs						3			2	2																1	1					
(b)	work out a plan of action, in advance, to ensure the safest outcome in the event of abnormal operations						3			2	2																1	1					
(c)	verify and correctly apply correction for the existing wind component to the take-off performance						3			2	2																1	1					
(d)	perform all pre take-off and line-up checks required by the aircraft checklist						3			2	2																1	1					
(e)	ensure approach path is clear of conflicting traffic and other hazards before lining up for take-off						3			2	2																1	1					
(f)	align the aeroplane on the runway centreline						3			2	2																1	1					
A2.2	**Take off aeroplane**																																
(a)	apply the controls correctly to maintain longitudinal alignment on the centreline of the runway, if appropriate, prior to initiating and during the take-off						3			2	2																		1		1		
(b)	adjust the power controls taking into account the existing conditions						3			2	2																		1		1		

4

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	Dual day	1	1	1	1	1	1	1	1	1	0.8		0.5		0.5		1	1	1	1	1		1	1	1		1	1	1.4		1.4	1.4	25.0
	Solo day											0.3		0.7		1						1				1				1			5.0
	Instrument flight time																										0.6	0.2	0.2		0.2	0.2	(1.4 IF)
	Training phases						Phase 1											Phase 2									Phase 3						30.0
	Aeronautical knowledge examinations										Pre-solo										Pre-area solo									RPLA			
(c)	monitor power controls, settings, and instruments during take-off to ensure all predetermined parameters are achieved and maintained						3			2	2																		1		1		
(d)	adjust the controls to attain the desired pitch attitude at the predetermined airspeed to attain the desired performance						3			2	2																		1		1		
(e)	perform the take-off applying the required pitch, roll and yaw inputs as appropriate in a smooth, coordinated manner						3			2	2																		1		1		
(f)	trim the aeroplane accurately						3			2	2																		1		1		
(g)	perform gear and flap retractions, power adjustments (as applicable) and other required pilot-related activities						3			2	2																		1		1		
(h)	maintain flight path along the runway extended centreline						3			2	2																		1		1		
(i)	apply the applicable noise abatement and wake turbulence avoidance procedures						3			2	2																		1		1		
(j)	recognise take-off abnormalities and take appropriate action to reject take-off (can be simulated)									2	2																		1		1		
A2.3	**Take off aeroplane in a crosswind**																																
(a)	perform a take-off in an aeroplane making appropriate adjustments for the crosswind conditions																			2	2								1		1		
(b)	maintain the runway centreline and extended centreline																			2	2								1		1		
A2.4	**Carry out after take-off procedures**																																
(a)	perform after take-off checklist						3			2	2																		1		1		
(b)	maintain the appropriate climb segment at the nominated heading and airspeed						3			2	2																		1		1		
(c)	manoeuvre according to local and standard procedures						3			2	2																		1		1		
(d)	maintain traffic separation						3			2	2																		1		1		
A2.5	**Take off aeroplane from 'short field'**																																
(a)	calculate take-off and landing performance in accordance with the aeroplane's performance charts																						3	2	2				1	S	1		
(b)	perform take-off aeroplane to achieve the minimum length take-off performance																						3	2	2				1	S	1		
(c)	perform take-off aeroplane to achieve the obstacle clearance parameters																						3	2	2				1	S	1		
A3	**Control aeroplane in normal flight**																																
A3.1	**Climb aeroplane**																																
(a)	operate and monitor all aircraft systems when commencing, during, and completing a climbing flight manoeuvre			3						2	2																	1	1				
(b)	adjust altimeter subscale according to applicable settings			3																								1	1				
(c)	identify and avoid terrain and traffic			3						2	2																	1	1				
(d)	for the following climbing manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:																																
	(i) cruise climb			3														2	2									1	1				
	(ii) best angle climb			3																			2	2				1	1				
	(iii) best rate climb			3														2	2									1	1				
(e)	anticipate level-off altitude and achieve straight and level flight			3						2	2																	1	1				
A3.2	**Maintain straight and level flight**																																
(a)	operate and monitor all aircraft systems during straight and level flight manoeuvres		3			2	2																					1	1				
(b)	adjust altimeter subscale according to applicable settings		3			2	2																					1	1				
(c)	identify and avoid terrain and traffic		3			2	2																					1	1				
(d)	for the following straight and level manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:																																
	(i) at slow speed		3			2	2																					1	1				
	(ii) at normal cruise		3			2	2																					1	1				
	(iii) at high-speed cruise		3			2	2																					1	1				
	(iv) during acceleration and deceleration		3			2	2																					1	1				
	(vii) with flaps selected		3			2	2																					1	1				
A3.3	**Descend aeroplane**																																
(a)	operate and monitor all aircraft systems during descending flight manoeuvres			3						2	2																	1	1				

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	Solo day											0.3		0.7		1						1				1				1			5.0
	Instrument flight time																										0.6	0.2	0.2		0.2	0.2	(1.4 IF)
	Training phases	Phase 1											Phase 2										Phase 3										**30.0**
	Aeronautical knowledge examinations	Pre-solo										Pre-area solo										RPLA											
(b)	for the following descending manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:																																
	(i) glide			3						2	2																	1	1				
	(ii) powered			3														2	2									1	1				
	(iii) approach configuration descent (flap and undercarriage)			3						2	2																	1	1				
(c)	anticipate level-off altitude and achieve straight and level flight			3														2	2									1	1				
A3.4	**Turn aeroplane**																																
(a)	operate and monitor all aircraft systems during turning flight manoeuvres				3					2	2																	1	1				
(b)	for the following turning manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:																																
	(i) level turns				3					2	2																	1	1				
	(ii) climbing turns				3					2	2																	1	1				
	(iii) powered descending turns				3					2	2																	1	1				
	(iv) gliding descending turns				3					2	2																	1	1				
(c)	complete turn manoeuvre on a nominated heading or geographical feature				3					2	2																	1	1				
(d)	turn aeroplane at varying rates to achieve specified tracks				3					2	2																	1	1				
(e)	manoeuvre aeroplane over specified tracks or geographical features				3					2	2																	1	1				
A3.5	**Control aeroplane at slow speeds**																																
(a)	complete pre-manoeuvre checks					2	2																						1		1		
(b)	operate and monitor all aircraft systems when operating the aeroplane at slow speed					2	2																						1		1		
(c)	for the following climbing manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:																																
	(i) minimum approach speed with flaps retracted					2	2																						1		1		
	(ii) minimum approach speed in approach configuration					2	2																						1		1		
(d)	observe audible and visual stall warnings and recover aeroplane to controlled flight					2	2																						1		1		
(e)	recognise and respond positively to reduced effectiveness of controls during slow flight manoeuvres					2	2																						1		1		
(f)	transition from slow speed configuration using take-off power to achieve nominated speed in excess of 1.5 Vs without loss of height					2	2																						1		1		
A3.6	**Perform circuits and approaches**																																
(a)	operate and monitor all aircraft systems when operating the aeroplane in the circuit						3			2	2	S		S		S				2									1		1		
(b)	in accordance with specific local procedures, safely perform a full circuit pattern (5 legs) by balancing and trimming the aeroplane accurately while applying smooth, coordinated control inputs to achieve the required flight tolerances specified for the flight path flown during traffic pattern manoeuvres as follows:																																
	(i) track upwind along extended centreline to 500 ft						3			2	2	S		S		S				2									1		1		
	(ii) establish and maintain crosswind leg tracking 90° to the runway						3			2	2	S		S		S				2									1		1		
	(iii) establish and maintain downwind leg tracking parallel to, and at a specified distance from, the runway at circuit height						3			2	2	S		S		S				2									1		1		
	(iv) establish base leg tracking 90° to the runway at a specified distance from the runway threshold						3			2	2	S		S		S				2									1		1		
(c)	perform checks as required throughout circuit						3			2	2	S		S		S				2									1		1		
(d)	establish the approach and landing configuration appropriate for the runway and meteorological conditions, and adjust the power plant controls as required for the following:																																
	(i) commence and control approach descent path						3			2	2	S		S		S				2									1		1		
	(ii) adjust descent commencement point to take account of extended downwind leg or traffic adjustments						3			2	2	S		S		S				2									1		1		
	(iii) align and maintain aircraft on final approach flight						3			2	2	S		S		S				2									1		1		

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	Solo day											0.3		0.7		1						1				1				1			5.0
	Instrument flight time																										0.6	0.2	0.2		0.2	0.2	(1.4 IF)
	Training phases	Phase 1											Phase 2										Phase 3										**30.0**
	Aeronautical knowledge examinations	Pre-solo										Pre-area solo											RPLA										
	path with specified or appropriate runway																																
	(iv) set and maintain approach configuration not below 500 ft AGL						3			2	2	S		S		S				2									1		1		
	(v) identify and maintain the nominated aiming point						3			2	2	S		S		S				2									1		1		
	(vi) maintain a stabilised approach angle at the nominated airspeed not less than 1.3Vs to the round-out height						3			2	2	S		S		S				2									1		1		
	(vii) verify existing wind conditions, make proper correction for drift, and maintain a precise ground track						3			2	2	S		S		S				2									1		1		
	(viii) apply speed allowances for wind gusts						3			2	2	S		S		S				2									1		1		
	(ix) configure aeroplane for landing						3			2	2	S		S		S				2									1		1		
(e)	maintain aircraft separation and position in the circuit with reference to other aircraft traffic in the circuit area						3			2	2	S		S		S				2									1		1		
A3.7	**Local area airspace**																																
(a)	using an appropriate chart, for the local area and circuit area:																																
	(i) identify geographical features																3		2		2							1	1				
	(ii) identify geographical limits																3		2		2							1	1				
	(iii) identify restricted, controlled and uncontrolled airspace areas																3		2		2							1	1				
	(iv) state local airspace limits																3		2		2							1	1				
	(v) identify the transit route between the departure aerodrome and training area																3		2		2							1	1				
	(vi) identify the geographical limits of the training area																3		2		2							1	1				
	(vii) identify aerodromes and landing areas within the local area																3		2		2							1	1				
(b)	maintain orientation and pinpoint location by using geographical features and a local area chart																3		2		2							1	1				
(c)	transit from the circuit area and transit to the designated training area																3		2		2							1	1				
(d)	operate safely within a transit lane (if applicable)																3		2		2							1	1				
(e)	remain clear of restricted, controlled and other appropriately designated airspace																3		2		2							1	1				
(f)	operate safely in the vicinity of local aerodromes and landing areas																3		2		2							1	1				
(g)	transit from the designated training area to the circuit area																3		2		2							1	1				
(h)	set QNH appropriately																3		2		2							1	1				
(i)	correctly determine which runway is to be used for landing																3		2		2							1	1				
(j)	ensure runway is serviceable and available																3		2		2							1	1				
(k)	position aircraft for arrival into the circuit																3		2		2							1	1				
A4	**Land aeroplane**																																
A4.1	**Land aeroplane**																																
(a)	maintain a constant landing position aim point						3			2	2								2										1		1		
(b)	achieve a smooth, positively-controlled transition from final approach to touchdown, including the following:																																
	(i) control ballooning during flare						3			2	2								2										1		1		
	(ii) touchdown at a controlled rate of descent, in the specified touchdown zone within tolerances						3			2	2								2										1		1		
	(iii) control bouncing after touchdown						3			2	2								2										1		1		
	(iv) touch down aligned with the centreline within tolerances						3			2	2								2										1		1		
(c)	ensure separation is maintained						3			2	2								2										1		1		
(d)	maintain positive directional control and crosswind correction during the after-landing roll						3			2	2								2										1		1		
(e)	use drag and braking devices, as applicable, in such a manner to bring the aeroplane to a safe stop						3			2	2								2										1		1		
(f)	complete the applicable after-landing checklist items in a timely manner						3			2	2								2										1		1		
A4.2	**Land aeroplane in a crosswind**																																
(a)	verify existing wind conditions, make proper correction for drift, and maintain a precise ground track																			2	2								1		1		
(b)	configure the aeroplane for the crosswind conditions																			2	2								1		1		
(c)	control the aeroplane during the transition from final approach to touchdown and during after-landing roll to compensate for the crosswind conditions																			2	2								1		1		
A4.3	**Conduct a missed approach**																																
(a)	recognise the conditions when a missed approach should be executed								3	2	2																		1		1		
(b)	make the decision to execute a missed approach when it is safe to do so								3	2	2																		1		1		
(c)	make a smooth, positively-controlled transition from approach to missed approach, including the following:																																

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		1 Effects of Controls	2 Straight and Level	3 Climbing and Descending	4 Turning	5 Stalling	6 Consolidation and Circuits	7 Circuits	8 Flapless & Missed Approaches	9 Circuit Emergencies	10 Circuits – Pre-solo	11 Solo Circuit	12 Circuit Consolidation	13 Solo Circuits	14 Circuit Consolidation	15 Solo Circuits	16 Advanced Stalling	17 Forced Landings	18 Steep Turns	19 Crosswind Circuits	20 Pre-Training Area Solo	21 First Training Area Solo	22 Short Field T/O & Landing	23 Consolidation	24 Precautionary Search	25 Solo Consolidation	26 Basic Instrument Flight	27 Consolidation	28 Consolidation	29 Solo Consolidation	30 Pre-Licence	31 Flight Test	Total hours
	Dual day	1	1	1	1	1	1	1	1	1	0.8		0.5		0.5		1	1	1	1	1		1	1	1		1	1	1.4		1.4	1.4	25.0
	Solo day											0.3		0.7		1						1				1				1			5.0
	Instrument flight time																										0.6	0.2	0.2		0.2	0.2	(1.4 IF)
	Training phases	Phase 1											Phase 2										Phase 3										30.0
	Aeronautical knowledge examinations	Pre-solo										Pre-area solo											RPLA										
	(i) select power, attitude and configuration to safely control aeroplane								3	2	2																		1		1		
	(ii) manoeuvre aeroplane clear of the ground and conduct after take-off procedures								3	2	2																		1		1		
	(iii) make allowance for wind velocity during go-around								3	2	2																		1		1		
	(iv) avoid wake turbulence								3	2	2																		1		1		
A4.4	**Perform recovery from missed landing**																																
(a)	recognise when a missed landing is occurring and when it is appropriate to take recovery action								3	2	2																		1		1		
(b)	make the decision to execute recovery from a missed landing only when it is safe to do so								3	2	2																		1		1		
(c)	make a smooth, positively-controlled transition from a missed landing to missed approach, including the following:																																
	(i) select power, attitude and configuration to safely control aeroplane								3	2	2																		1		1		
	(ii) manoeuvre aeroplane clear of the ground and conduct after take-off procedures								3	2	2																		1		1		
	(iii) make allowance for wind velocity during go-around								3	2	2																		1		1		
	(iv) avoid wake turbulence								3	2	2																		1		1		
A4.5	**Short landing**																																
(a)	land aeroplane at nominated touchdown point at minimum speed																						3	2	2			2	1		1		
(b)	control ballooning during flare																						3	2	2			2	1		1		
(c)	control bouncing after touchdown																						3	2	2			2	1		1		
(d)	maintain direction after touchdown																						3	2	2			2	1		1		
(e)	apply maximum braking without locking up wheels																						3	2	2			2	1		1		
(f)	stops aircraft within landing distance available																						3	2	2			2	1		1		
A5	**Aeroplane advanced manoeuvres**																																
A5.1	**Enter and recover from stall**																																
(a)	perform pre-manoeuvre checks for stalling					2	2										2				2			2		S			1	S	1		
(b)	recognise stall signs and symptoms					2	2										2				2			2		S			1	S	1		
(c)	control the aeroplane by applying the required pitch, roll and yaw inputs as appropriate in a smooth, coordinated manner, trim aeroplane accurately to enter and recover from the following manoeuvres:																																
	(i) incipient stall					2	2										2							2		S			1	S	1		
	(ii) stall with full power applied																2				2			2					1		1		
	(iii) stall without power applied					2	2																						1		1		
	(iv) stall under the following conditions:																																
	(A) straight and level flight					2	2										2									S			1	S	1		
	(B) climbing																2				2			2					1		1		
	(C) descending																2				2			2					1		1		
	(D) approach to land configuration					2	2																			S			1	S	1		
	(E) turning																2				2			2					1		1		
(d)	perform stall recovery as follows:																																
	(i) positively reduce angle of attack					2	2										2				2			2		S			1	S	1		
	(ii) use power available and excess height to increase the aircraft energy state					2	2										2				2			2		S			1	S	1		
	(iii) minimise height loss for simulated low altitude condition					2	2										2				2			2		S			1	S	1		
	(iv) re-establish desired flight path and aircraft control					2	2										2				2			2		S			1	S	1		
(e)	recover from stall in simulated partial and complete engine failure configurations																2				2			2					1		1		
A5.2	**Recover from incipient spin**																																
(a)	perform pre-manoeuvre checks for an incipient spin					3											2				2			2					1		1		
(b)	recognise an incipient spin					3											2				2			2					1		1		
(c)	use the aeroplane's attitude and power controls to execute an incipient spin manoeuvre from the following flight conditions and, using correct recovery technique, regain straight and level flight with height loss commensurate with the available altitude (simulated ground base height may be set):																																
	(i) straight and level flight																2				2			2					1		1		
	(ii) climbing																2				2			2					1		1		
	(iii) turning																2				2			2					1		1		
A5.3	**Turn aeroplane steeply**																																
(a)	pre-manoeuvre checks for steep turning																		3		2			2		S			1	S	1		
(b)	steep level turn using a nominated bank angle, ending on a nominated heading or geographical feature, without altitude change																		3		2			2		S			1	S	1		
(c)	steep descending turn using a nominated bank angle, ending on a nominated heading or geographical feature ending on a nominated altitude																		3		2			2					1		1		

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	Dual day	1	1	1	1	1	1	1	1	1	0.8		0.5		0.5		1	1	1	1	1		1	1	1		1	1	1.4		1.4	1.4	25.0
	Solo day											0.3		0.7		1						1				1				1			5.0
	Instrument flight time																										0.6	0.2	0.2		0.2	0.2	(1.4 IF)
	Training phases	Phase 1											Phase 2											Phase 3									**30.0**
	Aeronautical knowledge examinations	Pre-solo										Pre-area solo												RPLA									
(d)	aeroplane operating limits are not exceeded																		3		2			2		S			1	S	1		
A5.4	**Sideslip aeroplane (where flight manual permits)**																																
(a)	straight sideslip:																																
	(i) induce slip to achieve increased rate of descent while maintaining track and airspeed																		3		2			2					1		1		
	(ii) adjust rate of descent by coordinating angle of bank and applied rudder																		3		2			2					1		1		
(b)	sideslipping turn by adjusting the bank angle to turn through minimum heading change of 90° at constant airspeed using sideslip, and exiting the turn on a specified heading or geographical feature, within tolerance																		3		2			2					1		1		
(c)	recover from a sideslip and return the aeroplane to balanced flight																		3		2			2					1		1		
A6	**Manage abnormal situations – single-engine aeroplanes**																																
A6.1	**Manage engine failure - take-off (simulated)**																																
(a)	correctly identify an engine failure after take-off									2	2				2					2			2					1	1				
(b)	apply the highest priority to taking action to control the aeroplane									2	2				2					2			2					1	1				
(c)	maintain control of the aeroplane									2	2				2					2			2					1	1				
(d)	perform recall actions									2	2				2					2			2					1	1				
(e)	perform emergency actions as far as time permits									2	2				2					2			2					1	1				
(f)	manoeuvre the aeroplane to achieve the safest possible outcome									2	2				2					2			2					1	1				
(g)	ensure passengers adopt brace position																			3			2					1	1				
(h)	advise others such as ATS and other aircraft of intentions if time permits									2	2				2					2			2					1	1				
A6.2	**Manage engine failure in the circuit area (simulated)**																																
(a)	correctly identify an engine failure during flight									2	2				2					2			2						1		1		
(b)	apply the highest priority to taking action to control the aeroplane									2	2				2					2			2						1		1		
(c)	perform recall actions									2	2				2					2			2						1		1		
(d)	select a suitable landing area within gliding distance, on the aerodrome or elsewhere									2	2				2					2			2						1		1		
(e)	perform emergency procedures and land the aeroplane if the engine cannot be restarted as time permits									2	2				2					2			2						1		1		
(f)	advise ATS or other agencies capable of providing assistance of situation and intentions									2	2				2					2			2						1		1		
(g)	re-brief passengers about flight situation, brace position and harness security																			3			2						1		1		
(h)	land the aeroplane ensuring safest outcome if an engine restart is not achieved									2	2				2					2			2						1		1		
A6.3	**Perform forced landing (simulated)**																																
(a)	after a simulated complete engine failure has occurred, without prior indications, carry out the following:																																
	(i) identify complete power failure condition and control aeroplane																	3	2		2	S				S		2	1	S	1		
	(ii) perform immediate actions																	3	2		2	S				S		2	1	S	1		
	(iii) formulate and describe a recovery plan, including selecting the most suitable landing area																	3	2		2	S				S		2	1	S	1		
	(iv) establish optimal gliding flight path to position the aeroplane for a landing on the selected landing area																	3	2		2	S				S		2	1	S	1		
	(v) perform emergency procedures and land the aeroplane if the engine cannot be restarted as time permits																	3	2		2	S				S		2	1	S	1		
	(vi) advise ATS or other agencies capable of providing assistance of situation and intentions																	3	2		2	S				S		2	1	S	1		
	(vii) re-brief passengers about flight situation, brace position and harness security																	3	2		2	S				S		2	1	S	1		
	(viii) land the aeroplane ensuring safest outcome if an engine restart is not achieved																	3	2		2	S				S		2	1	S	1		
(b)	after a simulated partial engine failure has occurred, without prior indications, carry out the following:																																
	(i) identify partial power failure condition																	3						2					1		1		
	(ii) perform recall actions																	3						2					1		1		
	(iii) adjust flight controls to re-establish flight path that maximises performance for partial power condition and maintain a safe airspeed margin above stall speed																	3						2					1		1		
	(iv) establish radio communications where possible																	3						2					1		1		
	(v) perform partial engine failure actions																	3						2					1		1		
	(vi) formulate a plan to recover aeroplane to a safe																	3						2					1		1		

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	Solo day											0.3		0.7		1						1				1				1			5.0
	Instrument flight time																										0.6	0.2	0.2		0.2	0.2	(1.4 IF)
	Training phases	Phase 1											Phase 2										Phase 3										**30.0**
	Aeronautical knowledge examinations	Pre-solo										Pre-area solo											RPLA										
	landing area or aerodrome, taking into account that partial failure might lead to a full power failure at any time																																
	(vii) manoeuvre the aeroplane to a selected landing area or aerodrome using the remaining power to establish an optimal aircraft position for a safe landing																	3						2					1		1		
	(viii) advise ATS or other agencies capable of providing assistance of situation and intentions																	3						2					1		1		
	(ix) re-brief passengers about flight situation, brace position and harness security																	3						2					1		1		
	(x) maintain a contingency plan for coping with a full power failure throughout the manoeuvre																	3						2					1		1		
	(xi) when a safe landing position is established, shut down and secure engine and aeroplane																	3						2					1		1		
A6.4	**Conduct precautionary search and landing (simulated condition)**																																
(a)	assess flight circumstances and make an appropriate decision when to perform precautionary landing																								3			2	1		1		
(b)	configure aeroplane for conditions																								3			2	1		1		
(c)	perform precautionary search procedure																								3			2	1		1		
(d)	select landing area, carry out an inspection and assess its suitability for landing, taking into account:																																
	(i) unobstructed approach and overshoot paths																								3			2	1		1		
	(ii) landing area length adequate for landing																								3			2	1		1		
	(iii) landing area surface is suitable for aeroplane type and clear of hazards																								3			2	1		1		
(e)	maintain orientation and visual contact with the landing area																								3			2	1		1		
(f)	advise ATS or other agencies capable of providing assistance of situation and intentions																								3			2	1		1		
(g)	re-brief passengers about flight situation, brace position and harness security																								3			2	1		1		
(h)	land and secure aircraft and manage passengers																								3			2	1		1		
A6.5	**Manage other abnormal situations (simulated)**																																
(a)	correctly identify the situation and maintain safe control of the aeroplane at all times																	3						3	3				1		1		
(b)	manage abnormal and emergency situations in accordance with relevant emergency procedures and regulatory requirements																	3						3	3				1		1		
(c)	follow appropriate emergency procedures while maintaining control of the aeroplane																	3						3	3				1		1		
(d)	identify and conduct flight with an unreliable airspeed indication																											3	1		1		
(e)	correctly identify when an emergency evacuation of an aeroplane is required																	3						3	3				1		1		
(f)	execute a simulated emergency evacuation of an aeroplane																	3						3	3				1		1		
(g)	advise ATS or other agencies capable of providing assistance of situation and intentions																	3						3	3				1		1		
A6.6	**Recover from unusual flight attitudes**																																
(a)	identify nose-high or nose-low unusual attitude flight condition					3													3		2			2					1		1		
(b)	recover from nose-low or nose-high unusual attitudes by adjusting pitch, bank and power to resume controlled and balanced flight					3													3		2			2					1		1		
(c)	apply controlled corrective action while maintaining aircraft performance within limits					3													3		2			2					1		1		
IFF	**Full instrument panel manoeuvres**																																
IFF.1	**Determine and monitor the serviceability of flight instruments and instrument power sources**																																
(a)	determine serviceability of flight and navigational instruments																										3	3	1		1		
(b)	perform functional checks of flight and navigational instruments where applicable prior to take-off																										3	3	1		1		
(c)	monitor flight instrument and instrument power sources and react to any warnings, unserviceability or erroneous indications																										3	3	1		1		
IFF.2	**Perform manoeuvres using full instrument panel**																																
(a)	interpret flight instrument indications and apply procedures and techniques to achieve and maintain a specified flight path using the aircraft's full instrument panel																										3	3	1		1		
(c)	set and maintain power and attitude by reference to the full instrument panel to establish a rate 1 turn onto a nominated heading within the flight tolerances																										3	3	1		1		

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Solo day											0.3		0.7		1						1				1				1			5.0
Instrument flight time																										0.6	0.2	0.2		0.2	0.2	(1.4 IF)
Training phases	Phase 1										Phase 2										Phase 3											**30.0**
Aeronautical knowledge examinations	Pre-solo									Pre-area solo											RPLA											
IFF.3 Recover from upset situations and unusual attitudes																																
(a) correctly identify upset situations and unusual attitudes under simulated IMC																										3	3	**1**		**1**		
(b) recover to controlled flight from upset situations and unusual attitudes under simulated IMC from any combination of the following aircraft states:																																
(i) high and low-nose attitudes																										3	3	**1**		**1**		
(ii) varying angles of bank																										3	3	**1**		**1**		
(iii) various power settings																										3	3	**1**		**1**		
(iv) various aircraft configurations																										3	3	**1**		**1**		
(v) unbalanced flight																										3	3	**1**		**1**		

#Crosswind circuits lesson may be placed as required post first solo

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Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 1: EFFECTS OF CONTROLS

Flight no:	RPL(A)1.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Introduction to manoeuvring the aeroplane on the ground and in flight
- Attitude flying
- Primary and secondary effect of controls
- Operation of ancillary controls
- Effect of power, slipstream, airspeed, undercarriage (if retractable), flap and trim

PRE-FLIGHT KNOWLEDGE
Long Briefing: 1.0 hour Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Long briefing – Effects of Controls
- Planes of movement; pitch, roll & yaw
- Control surfaces
- Primary effect of controls
- Secondary effect of controls
- Operation of ancillary controls
- Effect of power, slipstream and airspeed
- Operation and effect of undercarriage (if retractable),operation and effect of flap
- Operation and effect of trimming control(s)
- Application in flight

Underpinning knowledge
- Identify grade of fuel, verify fuel quantity (pre-flight inspection) [C4 4(b)&(c)]
- Typical single-engine aeroplane systems [A4 4(a)], carburettor icing [A1 4(c)]
- Ground surface and propeller care considerations [A1 4(l)]
- Primary effects of controls [A3 4(a)]
- Secondary effects of controls [A3 4(b)]

HF & NTS
- Principles of ‘see and avoid’
- Visual scan technique - use of clock code
- Hand over/take over technique (e.g. ‘I have control – you have control’)
- Control technique

LESSON PLAN AND TRAINING RECORD
RPL(A) 1: EFFECTS OF CONTROLS

PRE-FLIGHT KNOWLEDGE **Long Briefing: 1.0 hour Pre-flight Briefing: 0.3 hour** **Underpinning knowledge: as required**	
Content	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual

MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** Required	Achieved*
C2.1	**Pre-flight actions and procedures**		
(a)	complete all required pre-flight administration documentation	3	
C2.2	**Perform pre-flight inspection**		
(b)	complete an internal and external check of the aircraft	3	
(e)	ensure all aircraft locking and securing devices, covers and bungs are removed and stowed securely	3	
A1.1	**Start and stop engine**		
(a)	perform engine start and after start actions	3	
(b)	perform engine shutdown and after shutdown actions	3	
(d)	considers ground surface in relation to contamination and propeller care during engine start and stop activities	3	
A1.2	**Taxi aeroplane**		
(b)	comply with taxiway and other aerodrome markings, right-of-way rules and ATC or marshalling instructions when applicable	3	
(d)	maintain safe taxi speed and control of the aircraft	3	
(e)	maintain safe spacing from other aircraft, obstructions, and persons	3	
(f)	taxi the aeroplane along the centre of the taxiway	3	
(g)	avoid causing a hazard to other aircraft, objects or persons	3	
(i)	correctly manage the engine during taxi manoeuvres	3	

LESSON PLAN AND TRAINING RECORD
RPL(A) 1: EFFECTS OF CONTROLS

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual

MOS Reference		Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
NTS1.1		**Maintain effective lookout**		
	(a)	maintain traffic separation using a systematic visual scan technique at a rate determined by traffic density, visibility and terrain	3	
C2.3		**Post-flight actions and procedures**		
	(a)	shut down aircraft	3	
	(b)	conduct post-flight inspection and secure the aircraft (if applicable)	3	
	(c)	complete all required post-flight administration documentation	3	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

DEBRIEFING

Content

- Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards
- Recommendations for next lesson (including any carryover/remedial training)
- Trainee preparation for next lesson
- Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

	Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 2: STRAIGHT AND LEVEL

Flight no:	RPL(A)2.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Establish and maintain straight and level flight
- Straight flight - reference point/heading, wings level, aeroplane in balance
- Level flight – attitude, trim
- Power + attitude+ configuration = performance
- Straight & level at various airspeeds, power settings and configurations:
  - normal, fast, slow & precautionary (flaps) cruise

PRE-FLIGHT KNOWLEDGE **Long Briefing: 1.0 hour Pre-flight Briefing: 0.3 hour** **Underpinning knowledge: as required**
Content
Long briefing – Straight & Level • Aerodynamic forces acting on the aeroplane; lift, weight, thrust, drag • Generation of lift • Stability • Attitude flying • Power + attitude +configuration = performance • Operation of controls and technique for maintaining straight flight & level flight • Instrument indications • Cruise configurations • Application in flight
Underpinning knowledge • Review/expand previously introduced knowledge as required • Typical single-engine aeroplane systems [[A1 4(a), A3 4(d)] • Fuel requirements for day VFR flight operation [C2 4(b), C4 4(a)]
HF & NTS • Principles of 'see and avoid' • Visual limitations • Visual scan technique - use of clock code • Hand over/take over technique (e.g. 'I have control – you have control') • Control technique

LESSON PLAN AND TRAINING RECORD
RPL(A) 2: STRAIGHT AND LEVEL

PRE-FLIGHT KNOWLEDGE **Long Briefing: 1.0 hour Pre-flight Briefing: 0.3 hour** **Underpinning knowledge: as required**	
Content	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual

MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** Required	**Performance Standard** Achieved*
C1.1	**Communicating face-to-face**		
(a)	pronounces words clearly, using an accent that does not cause difficulties in understanding	3	
(b)	conveys information in clearly structured sentences without confusion or ambiguity	3	
(c)	uses an extensive vocabulary to accurately communicate on general and technical topics, without excessive use of jargon, slang or colloquial language	3	
(d)	speaks fluently without long pauses, repetition or excessive false starts	3	
(e)	responds to communications with actions that demonstrate that the information has been received and understood	3	
(f)	exchanges information clearly in a variety of situations with both expert and non-expert English speakers while giving and receiving timely and appropriate responses	3	
(g)	uses appropriate techniques to validate communications	3	
A3.2	**Maintain straight and level flight**		
(a)	operate and monitor all aircraft systems during straight and level flight manoeuvres	3	
(b)	adjust altimeter subscale according to applicable settings	3	
(c)	identify and avoid terrain and traffic	3	
(d)	for the following straight and level manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) at slow speed	3	
	(ii) at normal cruise	3	

LESSON PLAN AND TRAINING RECORD
RPL(A) 2: STRAIGHT AND LEVEL

FLIGHT TRAINING **Suggested flight time: 1.0 hour dual**			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	 **Achieved***
	(iii) at high-speed cruise	3	
	(iv) during acceleration and deceleration	3	
	(vii) with flaps selected	3	

Enter the performance standard achieved if it is different to that required
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CONSOLIDATION AND/OR REMEDIAL TRAINING			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	 **Achieved**

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

LESSON PLAN AND TRAINING RECORD
RPL(A) 2: STRAIGHT AND LEVEL

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 3: CLIMBING AND DESCENDING

Flight no:	RPL(A)3.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Establish and maintain various types of climb and descent
- Entry and levelling off sequence
- Normal (cruise), best rate (V_y) and best angle (V_x) climbs
- Effect of undercarriage (if retractable), flap and power on the climb
- Cruise, glide and approach descents
- Effect of wind, undercarriage (if retractable), flap and power on the glide

PRE-FLIGHT KNOWLEDGE
Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Long briefing – Climbing and Descending
- Aerodynamic forces acting on the aeroplane during climb and descent
- Attitude flying
- Power + attitude + configuration = performance
- Maintenance of straight flight during climb and descent
- Entry and levelling off sequence (e.g. Power, Attitude, Trim - Attitude, Power, Trim)
- Normal, best rate (V_y) and best angle (V_x) climbs
- Climb performance - effect of power, wind and aeroplane configuration
- Glide performance - best glide speed, effect of aeroplane configuration, weight and wind
- Descending at various airspeeds, effect of power & flap
- Instrument indications
- Application in flight

Underpinning knowledge
- Review/expand previously introduced knowledge as required
- Typical aeroplane performance characteristics & the effect of local weather conditions [A1 4(e)]
- Factors affecting take-off and initial climb performance [A2 4(b)]
- Aeroplane performance [A3 4(e)]
- Engine considerations during prolonged climbing and descending [A3 4(l)]
- Aircraft performance in a glide (straight and turning) [A6 4(i)]

LESSON PLAN AND TRAINING RECORD
RPL(A) 3: CLIMBING AND DESCENDING

PRE-FLIGHT KNOWLEDGE **Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour** **Underpinning knowledge: as required**	
Content	
HF & NTS • Fitness for flight • Use of checklists [NTS2 4(h)] • Principles of 'see and avoid' • Visual limitations • Visual scan technique - use of clock code • Lookout technique prior to and during climb and descent • Monitor engine temperature and pressure • Hand over/take over technique (e.g. 'I have control – you have control') • Control technique	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
C4.1	**Plan fuel requirements**		
(a)	conduct transmission and receipt of radio communications using appropriate procedures and phraseology	3	
(c)	determine the total fuel required for the flight	3	
C4.2	**Manage fuel system**		
(a)	verify fuel quantity on-board aircraft prior to flight using two independent methods	3	
(b)	ensure the fuel caps are secured	3	
(c)	perform fuel quality check prior to flight	3	
(d)	ensure fuel drain cocks are closed	3	

LESSON PLAN AND TRAINING RECORD
RPL(A) 3: CLIMBING AND DESCENDING

FLIGHT TRAINING Suggested flight time: 1.0 hour dual		Performance Standard	
MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Required	Achieved*
A3.1	**Climb aeroplane**		
(a)	operate and monitor all aircraft systems when commencing, during, and completing a climbing flight manoeuvre	3	
(b)	adjust altimeter subscale according to applicable settings	3	
(c)	identify and avoid terrain and traffic	3	
(d)	for the following climbing manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) cruise climb	3	
	(ii) best angle climb	3	
	(iii) best rate climb	3	
(e)	anticipate level-off altitude and achieve straight and level flight	3	
A3.3	**Descend aeroplane**		
(a)	operate and monitor all aircraft systems during descending flight manoeuvres	3	
(b)	for the following descending manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) glide	3	
	(ii) powered	3	
	(iii) approach configuration descent (flap and undercarriage)	3	
(c)	anticipate level-off altitude and achieve straight and level flight	3	
NTS1.1	**Maintain effective lookout**		
(c)	perform airspace-cleared procedure before commencing any manoeuvre	3	
NTS1.4	**Set priorities and manage tasks**		
(a)	organise workload and priorities to ensure optimum outcome of the flight	3	

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LESSON PLAN AND TRAINING RECORD
RPL(A) 3: CLIMBING AND DESCENDING

CONSOLIDATION AND/OR REMEDIAL TRAINING			
		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Required**	**Achieved**

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 4: TURNING

Flight no:	RPL(A)4.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Adverse yaw demonstration
- Medium level turns
- Climbing turns
- Descending turns (glide and powered)
- Introduction to spiral dive – recognition and recovery (instructor demonstration only)
- Refuelling
- **Assess:**
  - Communicating face-to-face

PRE-FLIGHT KNOWLEDGE **Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour** **Underpinning knowledge: as required**
Content
Long briefing – Turning • Aerodynamic forces acting on the aeroplane during a turn • Adverse yaw • Overbank/underbank tendency • Attitude flying • Medium level turns, climbing turns, descending turns • Spiral dive introduction - causes, symptoms, recognition and recovery technique • Instrument indications • Application in flight
Underpinning knowledge • Review/expand previously introduced knowledge as required • Basic radiotelephony phraseology and common aviation terminology [C1 4(a)&(b)] • Phonetic alphabet [C3 4(a)] • Aeronautical radio system components [C3 4(c)] • Refuelling procedures, precautions and safety requirements [C4 4(d)-(g)] • Meaning of aerodrome markings, signals and local procedures [A1 4(k)]

LESSON PLAN AND TRAINING RECORD
RPL(A) 4: TURNING

PRE-FLIGHT KNOWLEDGE **Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour** **Underpinning knowledge: as required**	
Content	
HF & NTS • Fitness for flight • Principles of 'see and avoid' • Visual limitations • Visual scan technique - use of clock code • Lookout technique prior and during turning • Work cycle (e.g. lookout, attitude, performance-LAP) • Hand over/take over technique (e.g. 'I have control – you have control') • Control technique	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
C1.1	**Communicating face-to-face**		
(a)	pronounces words clearly, using an accent that does not cause difficulties in understanding	2	
(b)	conveys information in clearly structured sentences without confusion or ambiguity	2	
(c)	uses an extensive vocabulary to accurately communicate on general and technical topics, without excessive use of jargon, slang or colloquial language	2	
(d)	speaks fluently without long pauses, repetition or excessive false starts	2	
(e)	responds to communications with actions that demonstrate that the information has been received and understood	2	
(f)	exchanges information clearly in a variety of situations with both expert and non-expert English speakers while giving and receiving timely and appropriate responses	2	

LESSON PLAN AND TRAINING RECORD
RPL(A) 4: TURNING

FLIGHT TRAINING Suggested flight time: 1.0 hour dual			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** Required	Achieved*
(g)	uses appropriate techniques to validate communications	**2**	
C1.2	**Operational communication using an aeronautical radio**		
(c)	apply the phonetic alphabet	3	
(d)	transmit numbers	3	
(e)	make appropriate transmissions using standard aviation phraseology	3	
(f)	use plain English effectively when standard phraseology is inadequate	3	
(g)	receive appropriate responses to transmissions	3	
C3.1	**Operate radio equipment**		
(b)	conduct transmission and receipt of radio communications using appropriate procedures and phraseology	3	
C4.3	**Refuel aircraft**		
(a)	identify the correct type of fuel to be used	3	
(b)	ensure aircraft is earthed prior to refuelling and defueling operations	3	
(c)	correctly load and unload fuel	3	
(d)	ensure required fuel quantity is loaded	3	
(e)	ensure fuel caps are closed and secured after fuelling operations	3	
(f)	perform fuel quality checks	3	
C3.3	**Operate transponder**		
(a)	operate a transponder during normal, abnormal and emergency operations *(normal operations)*	3	
A3.4	**Turn aeroplane**		
(a)	operate and monitor all aircraft systems during turning flight manoeuvres	3	
(b)	for the following turning manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) level turns	3	
	(ii) climbing turns	3	
	(iii) powered descending turns	3	
	(iv) gliding descending turns	3	
(c)	complete turn manoeuvre on a nominated heading or geographical feature	3	
(d)	turn aeroplane at varying rates to achieve specified tracks	3	
(e)	manoeuvre aeroplane over specified tracks or geographical features	3	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

LESSON PLAN AND TRAINING RECORD
RPL(A) 4: TURNING

CONSOLIDATION AND/OR REMEDIAL TRAINING			
		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 5: STALLING

Flight no:	RPL(A)5.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Checklist procedures (e.g. HASELL)
- Slow flight
- Symptoms and recognition of an imminent stall
- Symptoms and recognition of a fully developed stall
- Recovery technique
- Effect of power on recovery
- Effect of power, undercarriage (if retractable) and flap on the stall
- Landing configuration stall
- Wing drop recovery
- Incipient spin recognition and recovery (instructor demonstration only)
- Engine start and shutdown malfunctions and emergencies
- **Assess:**
  - straight and level
  - control aeroplane at slow speed
  - stalling (from straight and level, approach configuration)
  - communicating face-to-face

PRE-FLIGHT KNOWLEDGE
Long Briefing: 0.8 hour   Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Long briefing – Stalling
- Stall aerodynamics
- Stall avoidance
- Control effectiveness at slow speed
- Symptoms and recognition of an imminent stall
- Stall warning device
- Symptoms and recognition of a fully developed stall
- Recovery from an imminent stall
- Recovery from fully developed stall
- Control technique
- Effect of power on recovery
- Factors affecting stall speed (weight, power, flap and/or slat position, dynamic loading, ice or damage to wings)
- Instrument indications
- Application in flight and checklist procedures (e.g. HASELL checks)

LESSON PLAN AND TRAINING RECORD
RPL(A) 5: STALLING

PRE-FLIGHT KNOWLEDGE
Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Underpinning knowledge
- Review/expand previously introduced knowledge as required
- Standard operating procedures for the category, and class or type of aircraft and the operator [C2 4(a)]
- Engine start procedures – cold start, flooded start
- Difference between normally aspirated and fuel-injected systems [A1 4(b)]
- Cause and effect of fuel vaporisation [A1 4(d)]
- Stall warning devices [A3 4(c)]
- Relationship between AOB, LF & stall speed [A3 4(i)]
- Relationship between induced drag and operating at low speed [A3 4(j)]
- Aerodynamic and aeroplane operational considerations related to slow flight, stalling, spinning & upset aeroplane states [A5 4(b)], including, but not limited to:
  - symptoms of approach to stall and throughout the stall manoeuvre until recovery
  - relationship between angle of attack and stall
  - effects of weight, ‘g’ force and angle of attack
  - dangers of unbalanced flight
  - principles relating to the position of the elevator control and the point of stall
  - priority given to reduce angle of attack during stall manoeuvres
  - loss of height is considered in relation to available height and energy state
  - the technique of converting excess height to speed
  - the technique of converting excess speed to height
  - symmetrical and rolling ‘g’ force limitations
  - higher stall speeds when the aeroplane is turning
  - effects on fuel, pitot and flap systems

HF & NTS
- Task management [NTS1 4(b)]
- Use of checklists and standard operating procedures to prevent errors [NTS2 4(h)]
- Application of situational awareness to identify real or potential threats [NTS2 4(c)]
- Developing and implementing plans of action to remove and mitigate threats and errors [NTS2 4(d)]
- Undesired aeroplane state – prevention, identifying, controlling [NTS2 4(e)]
- Initial reaction to undesired aeroplane state (‘startle effect’), importance of recognition skills and well-rehearsed responses
- How an undesired aeroplane state can develop from unmanaged threat or error [NTS2 4(f)]

Pre-flight briefing
- Review flight sequences, what to expect, see & do
- Check essential knowledge
- Reinforce threat & error management
- Reinforce significant airmanship points

Pre-flight knowledge components complete:	Instructor’s signature & date

LESSON PLAN AND TRAINING RECORD
RPL(A) 5: STALLING

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
C2.1	**Pre-flight actions and procedures**		
(b)	obtain, interpret and apply information contained in the required pre-flight operational documentation, including the following:		
	(ii) maintenance release	3	
	(iv) local observations	3	
(c)	identify special aerodrome procedures	3	
(e)	determine the suitability of the current weather conditions for the proposed flight	3	
(g)	determine whether the aircraft is serviceable for the proposed flight	3	
A1.1	**Start and stop engine**		
(c)	manage engine start and shutdown malfunctions and emergencies *(e.g. flooded start, inoperative magneto after start, inoperative magneto or live magneto on shutdown)*	3	
C1.1	**Communicating face-to-face**	**2**	
C2.2	**Perform pre-flight inspection**		
(a)	identify and secure equipment and documentation that is required for the flight	3	
(c)	identify all defects or damage to the aircraft	3	
A3.2	**Maintain straight and level flight**		
(a)	operate and monitor all aircraft systems during straight and level flight manoeuvres	**2**	
(b)	adjust altimeter subscale according to applicable settings	**2**	
(c)	identify and avoid terrain and traffic	**2**	
(d)	for the following straight and level manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) at slow speed	**2**	
	(ii) at normal cruise	**2**	
	(iii) at high-speed cruise	**2**	
	(iv) during acceleration and deceleration	**2**	
	(vii) with flaps selected	**2**	
A3.5	**Control aeroplane at slow speeds**		
(a)	complete pre-manoeuvre checks	**2**	
(b)	operate and monitor all aircraft systems when operating the aeroplane at slow speed	**2**	
(c)	for the following climbing manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		

LESSON PLAN AND TRAINING RECORD
RPL(A) 5: STALLING

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved*
	(i) minimum approach speed with flaps retracted	2	
	(ii) minimum approach speed in approach configuration	2	
(d)	observe audible and visual stall warnings and recover aeroplane to controlled flight	2	
(e)	recognise and respond positively to reduced effectiveness of controls during slow flight manoeuvres	2	
(f)	transition from slow speed configuration using take-off power to achieve nominated speed in excess of 1.5 Vs without loss of height	2	
A5.1	**Enter and recover from stall**		
(a)	perform pre-manoeuvre checks for stalling	2	
(b)	recognise stall signs and symptoms	2	
(c)	control the aeroplane by applying the required pitch, roll and yaw inputs as appropriate in a smooth, coordinated manner, trim aeroplane accurately to enter and recover from the following manoeuvres:		
	(i) incipient stall	2	
	(iii) stall without power applied	2	
	(iv) stall under the following conditions:		
	(A) straight and level flight	2	
	(D) approach to land configuration	2	
(d)	perform stall recovery as follows:		
	(i) positively reduce angle of attack	2	
	(ii) use power available and excess height to increase the aircraft energy state	2	
	(iii) minimise height loss for simulated low altitude condition	2	
	(iv) re-establish desired flight path and aircraft control	2	
A5.2	**Recover from incipient spin** *(instructor demonstration only)*		
(a)	perform pre-manoeuvre checks for an incipient spin	3	
(b)	recognise an incipient spin	3	
(c)	use the aeroplane's attitude and power controls to execute an incipient spin manoeuvre from the following flight conditions and, using correct recovery technique, regain straight and level flight with height loss commensurate with the available altitude (simulated ground base height may be set):		
	(i) straight and level flight		
A6.6	**Recover from unusual flight attitudes**		
(a)	identify nose-high unusual attitude flight condition	3	
(b)	recover from nose-high unusual attitudes by adjusting pitch, bank and power to resume controlled and balanced flight	3	
(c)	apply controlled corrective action while maintaining aircraft performance within limits	3	
C4.2	**Manage fuel system**		
(e)	monitor fuel usage during the flight	3	
(h)	perform fuel tank changes correctly	3	
(i)	maintain fuel load within aircraft limits	3	
(k)	operate fuel pumps and engine controls correctly	3	
NTS1.2	**Maintain situational awareness**		
(a)	monitor all aircraft systems using a systematic scan technique	3	
(b)	collect information to facilitate ongoing system management	3	
(c)	monitor flight environment for deviations from planned operations	3	

LESSON PLAN AND TRAINING RECORD
RPL(A) 5: STALLING

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
(d)	collect flight environment information to update planned operations	3	
NTS2.1	**Recognise and manage threats**		
(a)	identify relevant environmental or operational threats that are likely to affect the safety of the flight	3	
(d)	monitor and assess flight progress to ensure a safe outcome, or modify actions when a safe outcome is not assured	3	
NTS2.2	**Recognise and manage errors**		
(a)	apply checklists and standard operating procedures to prevent aircraft handling, procedural or communication errors	3	
(b)	identify committed errors before safety is affected or the aircraft enters an undesired state	3	
(d)	implement countermeasures to prevent errors or take action in the time available to correct errors before the aircraft enters an undesired state	3	
NTS2.3	**Recognise and manage undesired aircraft state**		
(a)	recognise an undesired aircraft state	3	
(b)	prioritise tasks to ensure an undesired aircraft state is managed effectively	3	
(c)	apply corrective actions to recover an undesired aircraft state in a safe and timely manner	3	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved

LESSON PLAN AND TRAINING RECORD
RPL(A) 5: STALLING

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 6: STALLING CONSOLIDATION AND CIRCUIT INTRODUCTION

Flight no:	RPL(A)6.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- Circuit introduction:
  - normal take-off
  - standard circuit
  - normal approach
  - normal landing
- **Assess**:
  - straight and level
  - control aeroplane at slow speed - training area
  - stalling (from straight and level, approach configuration) – training area
  - post-flight actions and procedures

PRE-FLIGHT KNOWLEDGE
Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Long briefing – Circuit introduction
- Circuit pattern
- Benefits of take-off and landing into wind
- Take-off technique
- Local aerodrome circuit procedures
- Aeroplane operating procedures and checklists
- Traffic management
- Interpretation of windsock indications - wind speed and direction
- Approach technique, judgement of aeroplane approach profile and regaining correct approach path
- Landing technique
- Procedures and cautions during touch and go

Underpinning knowledge
- Review/expand previously introduced knowledge as required
- Local aerodrome requirements [C2 4(f)], Local area operating procedures [A3 4(p)] (circuit area procedures)
- Documented radio procedures relevant to the VFR [C3 4(b)]
- Actions to be taken in the event of a brake, tyre or steering failure [A1 4(m)]

LESSON PLAN AND TRAINING RECORD
RPL(A) 6: STALLING CONSOLIDATION AND CIRCUIT INTRODUCTION

PRE-FLIGHT KNOWLEDGE
Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

HF & NTS
- Effective communication under normal circumstances [NTS1 4(a)]
- Application of situational awareness to identify real or potential environmental or operational threats to flight safety [NTS2 4(c)]
- Use of checklists and standard operating procedures to prevent errors [NTS2 4(h)]
- Task management, organise workload [NTS2 4(i),(i)-(v)]
- Visual scan technique - use of clock code, importance of lookout and identification of traffic
- Traffic management – speed control, circuit pattern adjustments
- Hand over/take over technique (e.g. ‘I have control – you have control’)
- Control technique

Pre-flight briefing
- Review flight sequences, what to expect, see & do
- Check essential knowledge
- Reinforce threat & error management
- Reinforce significant airmanship points

Pre-flight knowledge components complete:	**Instructor’s signature & date**

Performance Standard		
3	2	1
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
A1.2	**Taxi aeroplane**		
(c)	perform applicable taxi checks, including the following:		
	(i) brakes and steering function normally and take appropriate action in the event of a malfunction	3	
	(iii) altimeter setting	3	
(h)	correct handling techniques are applied to take into account wind from all four quadrants	3	
A2.1	**Carry out pre take-off procedures**		
(a)	correctly identify critical airspeeds, configurations, and emergency and abnormal procedures for normal and crosswind take-offs	3	
(b)	work out a plan of action, in advance, to ensure the safest outcome in the event of abnormal operations	3	

LESSON PLAN AND TRAINING RECORD
RPL(A) 6: STALLING CONSOLIDATION AND CIRCUIT INTRODUCTION

FLIGHT TRAINING Suggested flight time: 1.0 hour dual			
MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
(c)	verify and correctly apply correction for the existing wind component to the take-off performance	3	
(d)	perform all pre take-off and line-up checks required by the aircraft checklist	3	
(e)	ensure approach path is clear of conflicting traffic and other hazards before lining up for take-off	3	
(f)	align the aeroplane on the runway centreline	3	
A2.2	**Take off aeroplane**		
(a)	apply the controls correctly to maintain longitudinal alignment on the centreline of the runway, if appropriate, prior to initiating and during the take-off	3	
(b)	adjust the power controls taking into account the existing conditions	3	
(c)	monitor power controls, settings, and instruments during take-off to ensure all predetermined parameters are achieved and maintained	3	
(d)	adjust the controls to attain the desired pitch attitude at the predetermined airspeed to attain the desired performance	3	
(e)	perform the take-off applying the required pitch, roll and yaw inputs as appropriate in a smooth, coordinated manner	3	
(f)	trim the aeroplane accurately	3	
(g)	perform gear and flap retractions, power adjustments (as applicable) and other required pilot-related activities	3	
(h)	maintain flight path along the runway extended centreline	3	
(i)	apply the applicable noise abatement and wake turbulence avoidance procedures	3	
A2.4	**Carry out after take-off procedures**		
(a)	perform after take-off checklist	3	
(b)	maintain the appropriate climb segment at the nominated heading and airspeed	3	
(c)	manoeuvre according to local and standard procedures	3	
(d)	maintain traffic separation	3	
C1.2	**Operational communication using an aeronautical radio**		
(a)	maintain effective communication with others on operational matters	3	
(h)	respond to transmissions and take appropriate action	3	
(i)	recognise and manage communication errors and misunderstandings effectively	3	
(j)	seek clarification in the time available if a message is unclear or uncertainty exists	3	
(k)	react appropriately to a variety of regional accents	3	
C3.1	**Operate radio equipment**		
(c)	maintain a listening watch and respond appropriately to applicable transmissions	3	
A3.2	**Maintain straight and level flight**	**2**	
A3.5	**Control aeroplane at slow speeds**	**2**	
A5.1	**Enter and recover from stall**	**2**	
A3.6	**Perform circuits and approaches**		
(a)	operate and monitor all aircraft systems when operating the aeroplane in the circuit	3	
(b)	in accordance with specific local procedures, safely perform a full circuit pattern (5 legs) by balancing and trimming the aeroplane accurately while applying smooth, coordinated control inputs to achieve the required flight tolerances specified for the flight path flown during traffic pattern manoeuvres as follows:		
	(i) track upwind along extended centreline to 500 ft	3	
	(ii) establish and maintain crosswind leg tracking 90° to the runway	3	
	(iii) establish and maintain downwind leg tracking parallel to, and at a specified distance from, the runway at circuit height	3	
	(iv) establish base leg tracking 90° to the runway at a specified distance from the runway threshold	3	

LESSON PLAN AND TRAINING RECORD
RPL(A) 6: STALLING CONSOLIDATION AND CIRCUIT INTRODUCTION

FLIGHT TRAINING **Suggested flight time: 1.0 hour dual**			
		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Required**	**Achieved***
(c)	perform checks as required throughout circuit	3	
(d)	establish the approach and landing configuration appropriate for the runway and meteorological conditions, and adjust the power plant controls as required for the following:		
	(i) commence and control approach descent path	3	
	(ii) adjust descent commencement point to take account of extended downwind leg or traffic adjustments	3	
	(iii) align and maintain aircraft on final approach flight path with specified or appropriate runway	3	
	(iv) set and maintain approach configuration not below 500 ft AGL	3	
	(v) identify and maintain the nominated aiming point	3	
	(vi) maintain a stabilised approach angle at the nominated airspeed not less than 1.3Vs to the round-out height	3	
	(vii) verify existing wind conditions, make proper correction for drift, and maintain a precise ground track	3	
	(viii) apply speed allowances for wind gusts	3	
	(ix) configure aeroplane for landing	3	
(e)	maintain aircraft separation and position in the circuit with reference to other aircraft traffic in the circuit area	3	
NTS1.1	**Maintain effective lookout**		
(b)	maintain radio listening watch and interpret transmissions to determine traffic location and intentions	3	
NTS1.4	**Set priorities and manage tasks**		
(b)	plan events and tasks to occur sequentially	3	
(c)	anticipate events and tasks to ensure sufficient opportunity for completion	3	
A4.1	**Land aeroplane**		
(a)	maintain a constant landing position aim point	3	
(b)	achieve a smooth, positively-controlled transition from final approach to touchdown, including the following:		
	(i) control ballooning during flare	3	
	(ii) touchdown at a controlled rate of descent, in the specified touchdown zone within tolerances	3	
	(iii) control bouncing after touchdown	3	
	(iv) touch down aligned with the centreline within tolerances	3	
(c)	ensure separation is maintained	3	
(d)	maintain positive directional control and crosswind correction during the after-landing roll	3	
(e)	use drag and braking devices, as applicable, in such a manner to bring the aeroplane to a safe stop	3	
(f)	complete the applicable after-landing checklist items in a timely manner	3	
C2.3	**Post-flight actions and procedures**		
(a)	shut down aircraft	**2**	
(b)	conduct post-flight inspection and secure the aircraft (if applicable)	**2**	
(c)	complete all required post-flight administration documentation	**2**	

Enter the performance standard achieved if it is different to that required
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LESSON PLAN AND TRAINING RECORD
RPL(A) 6: STALLING CONSOLIDATION AND CIRCUIT INTRODUCTION

CONSOLIDATION AND/OR REMEDIAL TRAINING		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Required**	**Achieved**

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 7: CIRCUITS

Flight no:	RPL(A)7.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Revise and consolidate circuits
- Introduce procedure in the event of radio failure within the circuit
- **Assess:**
  - maintain effective lookout
  - post-flight actions and procedures

PRE-FLIGHT KNOWLEDGE **Long Briefing: as required Pre-flight Briefing: 0.3 hour** **Underpinning knowledge: as required**	
Content	
Long briefing – Circuits • Revise normal circuit operations as required • Radio failure fault finding procedures • Procedure to be followed in the event of a radio failure within the circuit	
Underpinning knowledge • Review/expand previously introduced knowledge as required • Light signals including interpretation and actions required [C3 4(f)]	
HF & NTS • Effective communication under normal circumstances [NTS1 4(a)] • Application of situational awareness to identify real or potential threats [NTS2 4(c)] • Task management, organise workload [NTS2 4(i),(i)-(v)] • Visual scan technique - use of clock code, identification of traffic • Traffic management – speed control, circuit pattern adjustments	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

LESSON PLAN AND TRAINING RECORD
RPL(A) 7: CIRCUITS

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved*
C3.1	**Operate radio equipment**		
(a)	confirm serviceability of radio equipment	3	
C3.2	**Manage R/T equipment malfunctions**		
(a)	perform radio failure procedures	3	
(b)	use fault finding procedures and perform corrective actions	3	
NTS1.1	**Maintain effective lookout**		
(a)	maintain traffic separation using a systematic visual scan technique at a rate determined by traffic density, visibility and terrain	**2**	
(b)	maintain radio listening watch and interpret transmissions to determine traffic location and intentions	**2**	
(c)	perform airspace-cleared procedure before commencing any manoeuvre	**2**	
C2.3	**Post-flight actions and procedures**	**2**	

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CONSOLIDATION AND/OR REMEDIAL TRAINING

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved

LESSON PLAN AND TRAINING RECORD
RPL(A) 7: CIRCUITS

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 8: CIRCUITS - FLAPLESS AND MISSED APPROACHES

Flight no:	RPL(A)8.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Circuit consolidation
- Flapless approach and landings
- Missed approach procedure
- Missed landing recovery
- **Assess:**
  - maintain effective lookout

PRE-FLIGHT KNOWLEDGE
Long Briefing: 0.5 hour   Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Long briefing – Flapless Approach & Landing and Missed Approach
- Flapless approach & landing
- Missed landing procedure
- Missed approach procedure

Underpinning knowledge
- Review/expand previously introduced knowledge as required
- Propeller wash, rotor wash and jet blast and how they affect other aircraft [A1 4(i), A4 4(j)]
- Obtaining or calculating the crosswind and down or upwind components [A2 4(a)]
- Interpreting windsock indications to determine wind direction and speed [A2 4(c)]
- Causes of loss of control of aeroplane on landing [A4 4(f)]
- Judging descent profiles in various configurations [A6 4(d)] (partial flap & flapless approaches)
- Prioritising activities during non-normal situations [A6 4(e)]

HF & NTS
- Application of situational awareness to identify real or potential threats [NTS2 4(c)]
- Developing and implementing plans of action to remove and mitigate threats & errors [NTS2 4(d)]
- Task management, organise workload [NTS2 4(i),(i)-(v)]
- Visual scan technique - use of clock code, identification of traffic
- Traffic management – speed control, circuit pattern adjustments

LESSON PLAN AND TRAINING RECORD
RPL(A) 8: CIRCUITS - FLAPLESS AND MISSED APPROACHES

PRE-FLIGHT KNOWLEDGE Long Briefing: 0.5 hour Pre-flight Briefing: 0.3 hour Underpinning knowledge: as required	
Content	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
NTS1.1	**Maintain effective lookout**	**2**	
NTS1.3	**Assess situations and make decisions**		
(a)	identify problems	3	
(b)	analyse problems	3	
(c)	identify solutions	3	
(d)	assess solutions and risks	3	
(e)	decide on a course of action	3	
(f)	communicate plans of action (if appropriate)	3	
(g)	allocate tasks for action (if appropriate)	3	
(h)	take actions to achieve optimum outcomes for the operation	3	
(i)	monitor progress against plan	3	
(j)	re-evaluate plan to achieve optimum outcomes	3	
NTS2.1	**Recognise and manage threats**		
(b)	identify when competing priorities and demands may represent a threat to the safety of the flight	3	
(c)	develop and implement countermeasures to manage threats	3	
A4.3	**Conduct a missed approach**		
(a)	recognise the conditions when a missed approach should be executed	3	

LESSON PLAN AND TRAINING RECORD
RPL(A) 8: CIRCUITS - FLAPLESS AND MISSED APPROACHES

FLIGHT TRAINING **Suggested flight time: 1.0 hour dual**			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	**Achieved***
(b)	make the decision to execute a missed approach when it is safe to do so	3	
(c)	make a smooth, positively-controlled transition from approach to missed approach, including the following:		
	(i) select power, attitude and configuration to safely control aeroplane	3	
	(ii) manoeuvre aeroplane clear of the ground and conduct after take-off procedures	3	
	(iii) make allowance for wind velocity during go-around	3	
	(iv) avoid wake turbulence	3	
A4.4	**Perform recovery from missed landing**		
(a)	recognise when a missed landing is occurring and when it is appropriate to take recovery action	3	
(b)	make the decision to execute recovery from a missed landing only when it is safe to do so	3	
(c)	make a smooth, positively-controlled transition from a missed landing to missed approach, including the following:		
	(i) select power, attitude and configuration to safely control aeroplane	3	
	(ii) manoeuvre aeroplane clear of the ground and conduct after take-off procedures	3	
	(iii) make allowance for wind velocity during go-around	3	
	(iv) avoid wake turbulence	3	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	**Achieved**

LESSON PLAN AND TRAINING RECORD
RPL(A) 8: CIRCUITS - FLAPLESS AND MISSED APPROACHES

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 9: CIRCUIT EMERGENCIES

Flight no:	RPL(A)9.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- Recognition of take-off abnormalities, rejected take-off
- Simulated engine failure after take-off
- Simulated engine failure in the circuit
- Glide approach and landing
- **Assess:**
  - operational communication using an aeronautical radio, operate radio equipment and transponder
  - pre-flight actions and procedures, perform pre-flight inspection
  - plan fuel requirements, manage fuel system
  - start and stop engine, taxi aeroplane
  - pre-take-off procedures, take-off, after take-off procedures
  - climbing, descending, turning
  - circuits and landings, including missed approach and missed landing recovery
  - simulated engine failure on take-off and within the circuit area
  - situational awareness, assess situations and make decisions, set priorities and manage tasks, recognise and manage threats, recognise and manage errors, recognise and manage undesired aircraft state

PRE-FLIGHT KNOWLEDGE
Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Long briefing – Circuit Emergencies

- Engine failure causes and prevention
- Engine failure during take-off
- Engine failure after take-off
- Engine failure in the circuit
- Vital actions and priorities
- Landing area selection
- Selection of aiming point
- Factors affecting glide performance
- Judgement and correction of overshoot/undershoot
- Glide approach and landing

LESSON PLAN AND TRAINING RECORD
RPL(A) 9: CIRCUIT EMERGENCIES

PRE-FLIGHT KNOWLEDGE Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour Underpinning knowledge: as required	
Content	
Underpinning knowledge • Review/expand previously introduced knowledge as required • Judging descent profiles in various configurations [A6 4(d)], Aircraft performance in a glide [A6 4(i)] • Prioritising activities during emergencies [A6 4(e)] • Suitable fields for forced landings and precautionary landings [A6 4(g)]	
HF & NTS • Effective communication under non-normal circumstances [NTS1 4(a)] • Developing and implementing plans of action to remove and mitigate threats & errors [NTS2 4(d)]	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
• Schedule pre-solo examination • Schedule general English language proficiency assessment (if applicable – refer CASR 141.306)	
Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
C1.2	**Operational communication using an aeronautical radio**		
(a)	maintain effective communication with others on operational matters	2	
(c)	apply the phonetic alphabet	2	
(d)	transmit numbers	2	
(e)	make appropriate transmissions using standard aviation phraseology	2	
(f)	use plain English effectively when standard phraseology is inadequate	2	
(g)	receive appropriate responses to transmissions	2	

LESSON PLAN AND TRAINING RECORD
RPL(A) 9: CIRCUIT EMERGENCIES

FLIGHT TRAINING Suggested flight time: 1.0 hour dual		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Required**	**Achieved***
(h)	respond to transmissions and take appropriate action	2	
(i)	recognise and manage communication errors and misunderstandings effectively	2	
(j)	seek clarification in the time available if a message is unclear or uncertainty exists	2	
(k)	react appropriately to a variety of regional accents	2	
C2.1	**Pre-flight actions and procedures**		
(a)	complete all required pre-flight administration documentation	2	
(b)	obtain, interpret and apply information contained in the required pre-flight operational documentation, including the following:		
	(ii) maintenance release	2	
(c)	identify special aerodrome procedures	2	
(e)	determine the suitability of the current weather conditions for the proposed flight	2	
(g)	determine whether the aircraft is serviceable for the proposed flight	2	
C2.2	**Perform pre-flight inspection**		
(a)	identify and secure equipment and documentation that is required for the flight	2	
(b)	complete an internal and external check of the aircraft	2	
(c)	identify all defects or damage to the aircraft	2	
(e)	ensure all aircraft locking and securing devices, covers and bungs are removed and stowed securely	2	
C4.1	**Plan fuel requirements**		
(a)	determine the required fuel reserves	2	
(c)	determine the total fuel required for the flight	2	
C4.2	**Manage fuel system**		
(a)	verify fuel quantity on-board aircraft prior to flight using two independent methods	2	
(b)	ensure the fuel caps are secured	2	
(c)	perform fuel quality check prior to flight	2	
(d)	ensure fuel drain cocks are closed	2	
(e)	monitor fuel usage during the flight	2	
(h)	perform fuel tank changes correctly	2	
(i)	maintain fuel load within aircraft limits	2	
(k)	operate fuel pumps and engine controls correctly	2	
A1.1	**Start and stop engine**		
(a)	perform engine start and after start actions	2	
(b)	perform engine shutdown and after shutdown actions	2	
(c)	manage engine start and shutdown malfunctions and emergencies *(e.g. simulated engine fire on startup and shutdown)*	3	
(d)	considers ground surface in relation to contamination and propeller care during engine start and stop activities	2	
A1.2	**Taxi aeroplane**		
(b)	comply with taxiway and other aerodrome markings, right-of-way rules and ATC or marshalling instructions when applicable	2	
(c)	perform applicable taxi checks, including the following:		
	(i) brakes and steering function normally and take appropriate action in the event of a malfunction	2	
	(ii) altimeter setting	2	

LESSON PLAN AND TRAINING RECORD
RPL(A) 9: CIRCUIT EMERGENCIES

FLIGHT TRAINING Suggested flight time: 1.0 hour dual		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved*
(d)	maintain safe taxi speed and control of the aircraft	2	
(e)	maintain safe spacing from other aircraft, obstructions, and persons	2	
(f)	taxi the aeroplane along the centre of the taxiway	2	
(g)	avoid causing a hazard to other aircraft, objects or persons	2	
(h)	correct handling techniques are applied to take into account wind from all four quadrants	2	
(i)	correctly manage the engine during taxi manoeuvres	2	
A2.1	**Carry out pre take-off procedures**		
(a)	correctly identify critical airspeeds, configurations, and emergency and abnormal procedures for normal and crosswind take-offs	2	
(b)	work out a plan of action, in advance, to ensure the safest outcome in the event of abnormal operations	2	
(c)	verify and correctly apply correction for the existing wind component to the take-off performance	2	
(d)	perform all pre take-off and line-up checks required by the aircraft checklist	2	
(e)	ensure approach path is clear of conflicting traffic and other hazards before lining up for take-off	2	
(f)	align the aeroplane on the runway centreline	2	
A2.2	**Take off aeroplane**		
(a)	apply the controls correctly to maintain longitudinal alignment on the centreline of the runway, if appropriate, prior to initiating and during the take-off	2	
(b)	adjust the power controls taking into account the existing conditions	2	
(c)	monitor power controls, settings, and instruments during take-off to ensure all predetermined parameters are achieved and maintained	2	
(d)	adjust the controls to attain the desired pitch attitude at the predetermined airspeed to attain the desired performance	2	
(e)	perform the take-off applying the required pitch, roll and yaw inputs as appropriate in a smooth, coordinated manner	2	
(f)	trim the aeroplane accurately	2	
(g)	perform gear and flap retractions, power adjustments (as applicable) and other required pilot-related activities	2	
(h)	maintain flight path along the runway extended centreline	2	
(i)	apply the applicable noise abatement and wake turbulence avoidance procedures	2	
(j)	recognise take-off abnormalities and take appropriate action to reject take-off (can be simulated)	2	
A2.4	**Carry out after take-off procedures**		
(a)	perform after take-off checklist	2	
(b)	maintain the appropriate climb segment at the nominated heading and airspeed	2	
(c)	manoeuvre according to local and standard procedures	2	
(d)	maintain traffic separation	2	
A6.1	**Manage engine failure - take-off (simulated)**		
(a)	correctly identify an engine failure after take-off	2	
(b)	apply the highest priority to taking action to control the aeroplane	2	
(c)	maintain control of the aeroplane	2	
(d)	perform recall actions	2	
(e)	perform emergency actions as far as time permits	2	
(f)	manoeuvre the aeroplane to achieve the safest possible outcome	2	
(h)	advise others such as ATS and other aircraft of intentions if time permits	2	

LESSON PLAN AND TRAINING RECORD
RPL(A) 9: CIRCUIT EMERGENCIES

FLIGHT TRAINING **Suggested flight time: 1.0 hour dual**			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	**Achieved***
A3.1	**Climb aeroplane**		
(a)	operate and monitor all aircraft systems when commencing, during, and completing a climbing flight manoeuvre	**2**	
(c)	identify and avoid terrain and traffic	**2**	
(e)	anticipate level-off altitude and achieve straight and level flight	**2**	
A3.3	**Descend aeroplane**		
(a)	operate and monitor all aircraft systems during descending flight manoeuvres	**2**	
(b)	for the following descending manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) glide	**2**	
	(ii) approach configuration descent (flap and undercarriage)	**2**	
A3.4	**Turn aeroplane**		
(a)	operate and monitor all aircraft systems during turning flight manoeuvres	**2**	
(b)	for the following turning manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) level turns	**2**	
	(ii) climbing turns	**2**	
	(iii) powered descending turns	**2**	
	(iv) gliding descending turns	**2**	
(c)	complete turn manoeuvre on a nominated heading or geographical feature	**2**	
(d)	turn aeroplane at varying rates to achieve specified tracks	**2**	
(e)	manoeuvre aeroplane over specified tracks or geographical features	**2**	
A3.6	**Perform circuits and approaches**		
(a)	operate and monitor all aircraft systems when operating the aeroplane in the circuit	**2**	
(b)	in accordance with specific local procedures, safely perform a full circuit pattern (5 legs) by balancing and trimming the aeroplane accurately while applying smooth, coordinated control inputs to achieve the required flight tolerances specified for the flight path flown during traffic pattern manoeuvres as follows:		
	(i) track upwind along extended centreline to 500 ft	**2**	
	(ii) establish and maintain crosswind leg tracking 90° to the runway	**2**	
	(iii) establish and maintain downwind leg tracking parallel to, and at a specified distance from, the runway at circuit height	**2**	
	(iv) establish base leg tracking 90° to the runway at a specified distance from the runway threshold	**2**	
(c)	perform checks as required throughout circuit	**2**	
(d)	establish the approach and landing configuration appropriate for the runway and meteorological conditions, and adjust the power plant controls as required for the following:		
	(i) commence and control approach descent path	**2**	
	(ii) adjust descent commencement point to take account of extended downwind leg or traffic adjustments	**2**	
	(iii) align and maintain aircraft on final approach flight path with specified or appropriate runway	**2**	
	(iv) set and maintain approach configuration not below 500 ft AGL	**2**	
	(v) identify and maintain the nominated aiming point	**2**	
	(vi) maintain a stabilised approach angle at the nominated airspeed not less than 1.3Vs to the round-out height	**2**	
	(vii) verify existing wind conditions, make proper correction for drift, and maintain a precise ground track	**2**	

LESSON PLAN AND TRAINING RECORD
RPL(A) 9: CIRCUIT EMERGENCIES

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved*
	(viii) apply speed allowances for wind gusts	2	
	(ix) configure aeroplane for landing	2	
(e)	maintain aircraft separation and position in the circuit with reference to other aircraft traffic in the circuit area	2	
C3.1	**Operate radio equipment**		
(a)	confirm serviceability of radio equipment	2	
(b)	conduct transmission and receipt of radio communications using appropriate procedures and phraseology	2	
(c)	maintain a listening watch and respond appropriately to applicable transmissions	2	
(d)	conduct appropriate emergency and urgency transmissions	2	
C3.3	**Operate transponder**		
(a)	operate a transponder during normal operations	2	
A6.2	**Manage engine failure in the circuit area (simulated)**		
(a)	correctly identify an engine failure during flight	2	
(b)	apply the highest priority to taking action to control the aeroplane	2	
(c)	perform recall actions	2	
(d)	select a suitable landing area within gliding distance, on the aerodrome or elsewhere	2	
(e)	perform emergency procedures and land the aeroplane if the engine cannot be restarted as time permits	2	
(f)	advise ATS or other agencies capable of providing assistance of situation and intentions	2	
(h)	land the aeroplane ensuring safest outcome if an engine restart is not achieved	2	
NTS1.2	**Maintain situational awareness**		
(a)	monitor all aircraft systems using a systematic scan technique	2	
(b)	collect information to facilitate ongoing system management	2	
(c)	monitor flight environment for deviations from planned operations	2	
(d)	collect flight environment information to update planned operations	2	
NTS1.3	**Assess situations and make decisions**		
(a)	identify problems	2	
(b)	analyse problems	2	
(c)	identify solutions	2	
(d)	assess solutions and risks	2	
(e)	decide on a course of action	2	
(f)	communicate plans of action (if appropriate)	2	
(g)	allocate tasks for action (if appropriate)	2	
(h)	take actions to achieve optimum outcomes for the operation	2	
(i)	monitor progress against plan	2	
(j)	re-evaluate plan to achieve optimum outcomes	2	
NTS1.4	**Set priorities and manage tasks**		
(a)	organise workload and priorities to ensure optimum outcome of the flight	2	
(b)	plan events and tasks to occur sequentially	2	
(c)	anticipate events and tasks to ensure sufficient opportunity for completion	2	
NTS2.1	**Recognise and manage threats**		
(a)	identify relevant environmental or operational threats that are likely to affect the safety of the flight	2	

LESSON PLAN AND TRAINING RECORD
RPL(A) 9: CIRCUIT EMERGENCIES

FLIGHT TRAINING Suggested flight time: 1.0 hour dual		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved*
(b)	identify when competing priorities and demands may represent a threat to the safety of the flight	2	
(c)	develop and implement countermeasures to manage threats	2	
(d)	monitor and assess flight progress to ensure a safe outcome, or modify actions when a safe outcome is not assured	2	
NTS2.2	**Recognise and manage errors**		
(a)	apply checklists and standard operating procedures to prevent aircraft handling, procedural or communication errors	2	
(b)	identify committed errors before safety is affected or the aircraft enters an undesired state	2	
(d)	implement countermeasures to prevent errors or take action in the time available to correct errors before the aircraft enters an undesired state	2	
NTS2.3	**Recognise and manage undesired aircraft state**		
(a)	recognise an undesired aircraft state	2	
(b)	prioritise tasks to ensure an undesired aircraft state is managed effectively	2	
(c)	apply corrective actions to recover an undesired aircraft state in a safe and timely manner	2	
A4.3	**Conduct a missed approach**		
(a)	recognise the conditions when a missed approach should be executed	2	
(b)	make the decision to execute a missed approach when it is safe to do so	2	
(c)	make a smooth, positively-controlled transition from approach to missed approach, including the following:		
	(i) select power, attitude and configuration to safely control aeroplane	2	
	(ii) manoeuvre aeroplane clear of the ground and conduct after take-off procedures	2	
	(iii) make allowance for wind velocity during go-around	2	
	(iv) avoid wake turbulence	2	
A4.4	**Perform recovery from missed landing**		
(a)	recognise when a missed landing is occurring and when it is appropriate to take recovery action	2	
(b)	make the decision to execute recovery from a missed landing only when it is safe to do so	2	
(c)	make a smooth, positively-controlled transition from a missed landing to missed approach, including the following:		
	(i) select power, attitude and configuration to safely control aeroplane	2	
	(ii) manoeuvre aeroplane clear of the ground and conduct after take-off procedures	2	
	(iii) make allowance for wind velocity during go-around	2	
	(iv) avoid wake turbulence	2	
A4.1	**Land aeroplane**		
(a)	maintain a constant landing position aim point	2	
(b)	achieve a smooth, positively-controlled transition from final approach to touchdown, including the following:		
	(i) control ballooning during flare	2	
	(ii) touchdown at a controlled rate of descent, in the specified touchdown zone within tolerances	2	
	(iii) control bouncing after touchdown	2	
	(iv) touch down aligned with the centreline within tolerances	2	
(c)	ensure separation is maintained	2	
(d)	maintain positive directional control and crosswind correction during the after-landing roll	2	
(e)	use drag and braking devices, as applicable, in such a manner to bring the aeroplane to a safe stop	2	
(f)	complete the applicable after-landing checklist items in a timely manner	2	

LESSON PLAN AND TRAINING RECORD
RPL(A) 9: CIRCUIT EMERGENCIES

***Enter the performance standard achieved if it is different to that required**
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 10: CIRCUITS - PRE-SOLO

Flight no:	RPL(A)10.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Consolidate circuits
- **Assess:**
  - operational communication using an aeronautical radio, operate radio equipment and transponder
  - pre-flight actions and procedures, perform pre-flight inspection
  - plan fuel requirements, manage fuel system
  - start and stop engine, taxi aeroplane
  - pre-take-off procedures, take-off, after take-off procedures
  - climbing, descending, turning
  - circuits and landings, including missed approach and missed landing recovery
  - simulated engine failure on take-off and within the circuit area
  - situational awareness, assess situations and make decisions, set priorities and manage tasks, recognise and manage threats, recognise and manage errors, recognise and manage undesired aircraft state

PRE-FLIGHT KNOWLEDGE
Long Briefing: as required Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Long briefing
- Revise circuit operations as required
- Guidelines for the conduct of the first solo flight

Underpinning knowledge
- Assess previously introduced underpinning knowledge
- Actions if communication from another aircraft misunderstood, or traffic within circuit not sighted

HF & NTS
- Revise as required

Pre-flight briefing
- Review flight sequences, what to expect, see & do
- Check essential knowledge
- Reinforce threat & error management
- Reinforce significant airmanship points

Theory examination
- Ensure pre-solo theory examination has been completed prior to commencing this training session

Pre-flight knowledge components complete:	**Instructor's signature & date**

LESSON PLAN AND TRAINING RECORD
RPL(A) 10: CIRCUITS - PRE-SOLO

Performance Standard		
3	2	1
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 0.8 hour dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
C1.2	Operational communication using an aeronautical radio	2	
C2.1	Pre-flight actions and procedures	2	
C2.2	Perform pre-flight inspection	2	
C4.1	Plan fuel requirements	2	
C4.2	Manage fuel system	2	
A1.1	Start and stop engine	2	
A1.2	Taxi aeroplane	2	
A2.1	Carry out pre take-off procedures	2	
A2.2	Take off aeroplane	2	
A2.4	Carry out after take-off procedures	2	
A6.1	Manage engine failure - take-off (simulated)	2	
A3.1	Climb aeroplane	2	
A3.3	Descend aeroplane	2	
A3.4	Turn aeroplane	2	
A3.6	Perform circuits and approaches	2	
C3.1	Operate radio equipment	2	
C3.3	Operate transponder	2	
A6.2	Manage engine failure in the circuit area (simulated)	2	
NTS1.2	Maintain situational awareness	2	
NTS1.3	Assess situations and make decisions	2	
NTS1.4	Set priorities and manage tasks	2	
NTS2.1	Recognise and manage threats	2	
NTS2.2	Recognise and manage errors	2	
NTS2.3	Recognise and manage undesired aircraft state	2	
A4.3	Conduct a missed approach	2	
A4.4	Perform recovery from missed landing	2	
A4.1	Land aeroplane	2	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

LESSON PLAN AND TRAINING RECORD
RPL(A) 10: CIRCUITS - PRE-SOLO

CONSOLIDATION AND/OR REMEDIAL TRAINING			
		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to first solo flight?#	**Yes**	**No**

 # The trainee must be assessed as capable of conducting the first solo flight safely. A minimum of performance standard 2 must have been achieved by the trainee in each of the assessments outlined in phase one of this syllabus (lessons RPL(A)1-10). The requirements of CASR Parts 61 and 141 must also be met.

Instructor's signature & date	Trainee's signature & date

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 11: FIRST SOLO CIRCUIT

Flight no:	RPL(A)11	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- One solo circuit in accordance with the limitations and guidelines advised by the authorising flight instructor
- Flight instructor to observe the entire circuit and landing

Operational Limitations:

Note: Except in emergency or urgency situations, or in the interests of maintaining safety, the trainee must not operate contrary to the authorisation specified by the instructor

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 12: CIRCUIT CONSOLIDATION

Flight no:	RPL(A)12.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Revise and consolidate circuits
- Confirm trainee competence to conduct subsequent solo circuits

PRE-FLIGHT KNOWLEDGE **Long Briefing: as required Pre-flight Briefing: 0.3 hour** **Underpinning knowledge: as required**	
Content	
Long briefing • Revise circuit operations as required • Guidelines for the conduct of further solo flight	
Underpinning knowledge • Revise and assess as required • Actions if communication from another aircraft misunderstood, or traffic within circuit not sighted • Missed approach procedure • Missed landing procedure • Circuit emergencies	
HF & NTS • Revise as required	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

LESSON PLAN AND TRAINING RECORD
RPL(A) 12: CIRCUIT CONSOLIDATION

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 0.5 hour dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
C1.2	**Operational communication using an aeronautical radio**	2	
C2.1	**Pre-flight actions and procedures**	2	
C2.2	**Perform pre-flight inspection**	2	
C4.1	**Plan fuel requirements**	2	
C4.2	**Manage fuel system**	2	
A1.1	**Start and stop engine**	2	
A1.2	**Taxi aeroplane**	2	
A2.1	**Carry out pre take-off procedures**	2	
A2.2	**Take off aeroplane**	2	
A2.4	**Carry out after take-off procedures**	2	
A6.1	**Manage engine failure - take-off (simulated)**	2	
A3.1	**Climb aeroplane**	2	
A3.3	**Descend aeroplane**	2	
A3.4	**Turn aeroplane**	2	
A3.6	**Perform circuits and approaches**	2	
C3.1	**Operate radio equipment**	2	
C3.3	**Operate Transponder**	2	
A6.2	**Manage engine failure in the circuit area (simulated)**	2	
NTS1.2	**Maintain situational awareness**	2	
NTS1.3	**Assess situations and make decisions**	2	
NTS1.4	**Set priorities and manage tasks**	2	
NTS2.1	**Recognise and manage threats**	2	
NTS2.2	**Recognise and manage errors**	2	
NTS2.3	**Recognise and manage undesired aircraft state**	2	
A4.3	**Conduct a missed approach**	2	
A4.4	**Perform recovery from missed landing**	2	
A4.1	**Land aeroplane**	2	

Enter the performance standard achieved if it is different to that required
If the trainee has not maintained the required performance standard, further training must be conducted and another assessment of competency made prior to authorisation of solo flight.

LESSON PLAN AND TRAINING RECORD
RPL(A) 12: CIRCUIT CONSOLIDATION

CONSOLIDATION AND/OR REMEDIAL TRAINING			
		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Trainee competent for further solo flight?	**Yes**	**No**

Instructor’s signature & date	Trainee’s signature & date

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 13: SOLO CIRCUITS

Flight no:	RPL(A)13.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- Solo circuits in accordance with the limitations and guidelines advised by the authorising flight instructor
- **Suggested flight time: 0.7 hour**

Operational Limitations:

Note: Except in emergency or urgency situations, or in the interests of maintaining safety, the trainee must not operate contrary to the authorisation specified by the instructor

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 14: CIRCUIT CONSOLIDATION

Flight no:	RPL(A)14.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Revise and consolidate circuits
- Confirm trainee competence to conduct subsequent solo circuits

PRE-FLIGHT KNOWLEDGE **Long Briefing: as required Pre-flight Briefing: 0.3 hour** **Underpinning knowledge: as required**	
Content	
Long briefing • Revise circuit operations as required • Guidelines for the conduct of further solo flight	
Underpinning knowledge • Revise and assess as required • Actions if communication from another aircraft misunderstood, or traffic within circuit not sighted • Missed approach procedure • Missed landing procedure • Circuit emergencies	
HF & NTS • Revise as required	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

LESSON PLAN AND TRAINING RECORD
RPL(A) 14: CIRCUIT CONSOLIDATION

Performance Standard		
3	2	1
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 0.5 hour dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved*
C1.2	Operational communication using an aeronautical radio	2	
C2.1	Pre-flight actions and procedures	2	
C2.2	Perform pre-flight inspection	2	
C4.1	Plan fuel requirements	2	
C4.2	Manage fuel system	2	
A1.1	Start and stop engine	2	
A1.2	Taxi aeroplane	2	
A2.1	Carry out pre take-off procedures	2	
A2.2	Take off aeroplane	2	
A2.4	Carry out after take-off procedures	2	
A6.1	Manage engine failure - take-off (simulated)	2	
A3.1	Climb aeroplane	2	
A3.3	Descend aeroplane	2	
A3.4	Turn aeroplane	2	
A3.6	Perform circuits and approaches	2	
C3.1	Operate radio equipment	2	
C3.3	Operate Transponder	2	
A6.2	Manage engine failure in the circuit area (simulated)	2	
NTS1.2	Maintain situational awareness	2	
NTS1.3	Assess situations and make decisions	2	
NTS1.4	Set priorities and manage tasks	2	
NTS2.1	Recognise and manage threats	2	
NTS2.2	Recognise and manage errors	2	
NTS2.3	Recognise and manage undesired aircraft state	2	
A4.3	Conduct a missed approach	2	
A4.4	Perform recovery from missed landing	2	
A4.1	Land aeroplane	2	

Enter the performance standard achieved if it is different to that required
If the trainee has not maintained the required performance standard, further training must be conducted and another assessment of competency made prior to authorisation of solo flight.

LESSON PLAN AND TRAINING RECORD
RPL(A) 14: CIRCUIT CONSOLIDATION

CONSOLIDATION AND/OR REMEDIAL TRAINING			
		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Trainee competent for further solo flight?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 15: SOLO CIRCUITS

Flight no:	RPL(A)15.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Solo circuits in accordance with the limitations and guidelines advised by the authorising flight instructor
- **Suggested flight time: 1.0 hour**

Operational Limitations:

Note: Except in emergency or urgency situations, or in the interests of maintaining safety, the trainee must not operate contrary to the authorisation specified by the instructor

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 16: ADVANCED STALLING

Flight no:	RPL(A)16.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Recognition and recovery from nose high unusual attitude flight conditions
- Revise incipient stall and stall from straight and level
- Advanced stalls – stall entry from climbing, descending (including glide configuration), turning
- Incipient spins – entry from straight and level, climbing and turning
- Circuit departure and arrival procedures
- Local area airspace procedures
- Weather forecasts
- **Assess:**
  - advanced stalling and incipient spin recovery

PRE-FLIGHT KNOWLEDGE
Long Briefing: 0.8 hour   Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Long briefing – Advanced Stalling
- Review essential knowledge from stalling brief
- Advanced stalling – stall recognition, recovery and control technique, entry from the following manoeuvres:
  - climbing
  - descending (approach configuration and glide, simulated partial and complete engine failure configurations)
  - turning
  - climbing turn
  - descending turn (approach configuration and glide)
- Recognition of and recovery from an incipient spin, entry from the following manoeuvres:
  - straight and level
  - climbing
  - turning
- Application in flight and checklist procedures (e.g. HASELL)

LESSON PLAN AND TRAINING RECORD
RPL(A) 16: ADVANCED STALLING

PRE-FLIGHT KNOWLEDGE **Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour** **Underpinning knowledge: as required**
Content
Underpinning knowledge • Review/expand previously introduced knowledge as required • Local weather patterns [C2 4(e)] • Documented radio procedures relevant to the VFR [C3 4(b)] (relevant to transit to and from, and operations within, the training area) • The environmental conditions that represent VMC [A1 4(h) & A3 4(n)]], Day VFR flight rules [A1 4(j) & A3 4(o)] • Relationship between AOB, LF & stall speed [A3 4(i)] • Relationship between induced drag and operating at low speed [A3 4(j)] • Local area operating procedures [A3 4(p)] (relevant to transit to and from, and operations within, the training area), training area lateral & vertical boundaries • Aerodynamic and aeroplane operational considerations related to slow flight, stalling, spinning & upset aeroplane states [A5 4(b)(i)-(xii)]
HF & NTS • Task management [NTS1 4(b)] • Undesired aeroplane state – prevention, identifying, controlling [NTS2 4(e)] • How an undesired aeroplane state can develop from unmanaged threat or error [NTS2 4(f)] • Use of checklists and standard operating procedures to prevent errors [NTS2 4(h)]
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points

Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

LESSON PLAN AND TRAINING RECORD
RPL(A) 16: ADVANCED STALLING

FLIGHT TRAINING Suggested flight time: 1.0 hour dual			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved*
C1.2	**Communicating face-to-face**		
(b)	communicate effectively in unfamiliar, stressful or non-standard situations	3	
(l)	communicate effectively in unexpected, stressful or non-standard situations using standard phraseology or plain English	3	
C2.1	**Pre-flight actions and procedures**		
(b)	obtain, interpret and apply information contained in the required pre-flight operational documentation, including the following:		
	(iii) weather forecasts	3	
(d)	identify all relevant radio and navigation aid facilities to be used during the flight (if applicable)	3	
(e)	determine the suitability of the forecast weather conditions for the proposed flight	3	
A3.7	**Local area airspace**		
(a)	using an appropriate chart, for the local area and circuit area:		
	(i) identify geographical features	3	
	(ii) identify geographical limits	3	
	(iii) identify restricted, controlled and uncontrolled airspace areas	3	
	(iv) state local airspace limits	3	
	(v) identify the transit route between the departure aerodrome and training area	3	
	(vi) identify the geographical limits of the training area	3	
	(vii) identify aerodromes and landing areas within the local area	3	
(b)	maintain orientation and pinpoint location by using geographical features and a local area chart	3	
(c)	transit from the circuit area and transit to the designated training area	3	
(d)	operate safely within a transit lane (if applicable)	3	
(e)	remain clear of restricted, controlled and other appropriately designated airspace	3	
(f)	operate safely in the vicinity of local aerodromes and landing areas	3	
(g)	transit from the designated training area to the circuit area	3	
(h)	set QNH appropriately	3	
(i)	correctly determine which runway is to be used for landing	3	
(j)	ensure runway is serviceable and available	3	
(k)	position aircraft for arrival into the circuit	3	
A5.1	**Enter and recover from stall**		
(a)	perform pre-manoeuvre checks for stalling	2	
(b)	recognise stall signs and symptoms	2	
(c)	control the aeroplane by applying the required pitch, roll and yaw inputs as appropriate in a smooth, coordinated manner, trim aeroplane accurately to enter and recover from the following manoeuvres:		
	(i) incipient stall	2	
	(ii) stall with full power applied	**2**	
	(iv) stall under the following conditions:		
	(A) straight and level flight	2	
	(B) climbing	**2**	
	(C) descending	**2**	
	(E) turning	**2**	

LESSON PLAN AND TRAINING RECORD
RPL(A) 16: ADVANCED STALLING

FLIGHT TRAINING **Suggested flight time: 1.0 hour dual**			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	**Achieved***
(d)	perform stall recovery as follows:		
	(i) positively reduce angle of attack	2	
	(ii) use power available and excess height to increase the aircraft energy state	2	
	(iii) minimise height loss for simulated low altitude condition	2	
	(iv) re-establish desired flight path and aircraft control	2	
(e)	recover from stall in simulated partial and complete engine failure configurations	**2**	
A5.2	**Recover from incipient spin**		
(a)	perform pre-manoeuvre checks for an incipient spin	**2**	
(b)	recognise an incipient spin	**2**	
(c)	use the aeroplane's attitude and power controls to execute an incipient spin manoeuvre from the following flight conditions and, using correct recovery technique, regain straight and level flight with height loss commensurate with the available altitude (simulated ground base height may be set):		
	(i) straight and level flight	**2**	
	(ii) climbing	**2**	
	(iii) turning	**2**	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	**Achieved**

LESSON PLAN AND TRAINING RECORD
RPL(A) 16: ADVANCED STALLING

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 17: FORCED LANDINGS

Flight no:	RPL(A)17.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- Weight and balance, take-off and landing performance calculations, fuel calculations
- Refuelling
- Practice forced landings (simulated complete and partial engine failure conditions)
- Manage other simulated abnormal situations
- Passenger management (simulated)
- **Assess:**
  - engine start and shutdown malfunctions and emergencies
  - climbing (cruise and best rate)
  - descending (cruise descent)

PRE-FLIGHT KNOWLEDGE
Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Long briefing – Practice Forced Landings

- Common engine failure causes (partial and complete engine failures)
- Immediate/vital actions (including initial trouble checks)
- Wind indicators and assessment
- Landing area selection
- Planning and flying the approach, actions if high or low
- Detailed trouble checks
- Radio procedures (MAYDAY call)
- Passenger briefing and management
- Final approach judgement, recognition and management of over/undershoot
- Shutdown checks
- Engine management considerations during simulated engine failures

PLAN AND TRAINING RECORD
RPL(A) 17: FORCED LANDINGS

PRE-FLIGHT KNOWLEDGE **Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour** **Underpinning knowledge: as required**	
Content	
Underpinning knowledge • Review/expand previously introduced knowledge as required • Variations to planned fuel consumption [C4 4(h)] • Managing passengers during abnormal or emergency situations [C5 4(a)] • Local procedures for movement of passengers [C5 4(b)], Security requirements [C5 4(c)] • Dangerous goods awareness [C5 4(d)], Health and safety regulations and best practice [C5 4(e)] • Take-off distance required calculation [A2 4(d)], Aerodrome charts [A2 4(e)] • Local topographical charts- identify safe areas for engine-failure purposes, noise-abatement considerations [A2 4(f)] • Aircraft weight & balance and how to calculate centre of gravity [A1 4(f), A3 4(f) & A4 4(d)] • Engine failure scenarios and procedures for partial and complete power loss [A6 4(a)] • Forced landing scenarios and procedures [A6 4(b)], Judging descent profiles in various configurations [A6 4(d)] • Prioritising activities during emergencies and non-normal situations [A6 4(e)] • Ditching [A6 4(f)] • Suitable fields for forced landings [A6 4(g)] • Considerations when practising emergencies and non-normal operations [A6 4(h)] • Aircraft performance in a glide (straight & turning) [A6 4(i)] • Effects of partial engine power on performance, flight profile, range and landing options [A6 4(k)] • Passenger control and briefing [A6 4(m)] • Low-flying hazards[A6 4(o)]	
HF & NTS • Effective communication under normal and non-normal circumstances [NTS1 4(a), NTS2 4(a)] • Threat and error management detailing processes that can be used to identify and mitigate or control threats and errors [NTS2 4(b)] • Task management [NTS2 4(I)], including: − workload organisation and priority setting to ensure optimum safe outcome of the flight − event planning to occur in a logical and sequential manner − anticipating events to ensure sufficient opportunity is available for completion − using technology to reduce workload and improve cognitive and manipulative activities − task prioritisation and protection whilst filtering and managing real time information • Aviate, Navigate, Communicate • Undesired aeroplane state – prevention, identifying, controlling [NTS2 4(e)] • How an undesired aeroplane state can develop from unmanaged threat or error [NTS2 4(f)] • Use of checklists and standard operating procedures to prevent errors [NTS2 4(h)]	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

PLAN AND TRAINING RECORD
RPL(A) 17: FORCED LANDINGS

Performance Standard		
3	2	1
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
C2.1	**Pre-flight actions and procedures**		
(f)	using the aircraft documents, calculate the following for a given set of environmental and operational conditions:		
	(i) weight and balance	3	
	(iii) take-off and landing performance	3	
	(iv) fuel requirements	3	
C4.1	**Plan fuel requirements**		
(b)	determine the quantity of fuel required taking into account operational requirements and relevant abnormal or emergency conditions and contingencies	3	
C4.3	**Refuel aircraft**	3	
A1.1	**Start and stop engine**		
(c)	manage engine start and shutdown malfunctions and emergencies *(e.g. flooded start, engine fire on start up, engine fire on shutdown)*	**2**	
A1.2	**Taxi aeroplane**		
(a)	use aerodrome or landing area charts to taxi aircraft	3	
(c)	perform applicable taxi checks, including the following:		
	(ii) instruments for correct readings	3	
A3.1	**Climb aeroplane**		
(d)	for the following climbing manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) cruise climb	**2**	
	(iii) best rate climb	**2**	
A3.3	**Descend aeroplane**		
(b)	for the following descending manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(ii) powered	**2**	
(c)	anticipate level-off altitude and achieve straight and level flight	**2**	
C3.3	**Operate transponder**		
(a)	operate a transponder during abnormal and emergency operations	**2**	
(b)	recall transponder emergency codes	**2**	
A6.3	**Perform forced landing (simulated)**		
(a)	after a simulated complete engine failure has occurred, without prior indications, carry out the following:		

PLAN AND TRAINING RECORD
RPL(A) 17: FORCED LANDINGS

FLIGHT TRAINING **Suggested flight time: 1.0 hour dual**			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	**Achieved***
	(i) identify complete power failure condition and control aeroplane	3	
	(ii) perform immediate actions	3	
	(iii) formulate and describe a recovery plan, including selecting the most suitable landing area	3	
	(iv) establish optimal gliding flight path to position the aeroplane for a landing on the selected landing area	3	
	(v) perform emergency procedures and land the aeroplane if the engine cannot be restarted as time permits	3	
	(vi) advise ATS or other agencies capable of providing assistance of situation and intentions	3	
	(vii) re-brief passengers about flight situation, brace position and harness security	3	
	(viii) land the aeroplane ensuring safest outcome if an engine restart is not achieved	3	
(b)	after a simulated partial engine failure has occurred, without prior indications, carry out the following:		
	(i) identify partial power failure condition	3	
	(ii) perform recall actions	3	
	(iii) adjust flight controls to re-establish flight path that maximises performance for partial power condition and maintain a safe airspeed margin above stall speed	3	
	(iv) establish radio communications where possible	3	
	(v) perform partial engine failure actions	3	
	(vi) formulate a plan to recover aeroplane to a safe landing area or aerodrome, taking into account that partial failure might lead to a full power failure at any time	3	
	(vii) manoeuvre the aeroplane to a selected landing area or aerodrome using the remaining power to establish an optimal aircraft position for a safe landing	3	
	(viii) advise ATS or other agencies capable of providing assistance of situation and intentions	3	
	(ix) re-brief passengers about flight situation, brace position and harness security	3	
	(x) maintain a contingency plan for coping with a full power failure throughout the manoeuvre	3	
	(xi) when a safe landing position is established, shut down and secure engine and aeroplane	3	
A6.5	**Manage other abnormal situations (simulated)** *(e.g. simulated engine fire in flight)*		
(a)	correctly identify the situation and maintain safe control of the aeroplane at all times	3	
(b)	manage abnormal and emergency situations in accordance with relevant emergency procedures and regulatory requirements	3	
(c)	follow appropriate emergency procedures while maintaining control of the aeroplane	3	
(e)	correctly identify when an emergency evacuation of an aeroplane is required	3	
(f)	execute a simulated emergency evacuation of an aeroplane	3	
(g)	advise ATS or other agencies capable of providing assistance of situation and intentions	3	
C4.2	**Manage fuel system**		
(j)	operate the fuel cross-feed system correctly (if fitted)	3	
C5.1	**Manage passengers**		
(a)	supervise passenger safety	3	
(b)	encourage passengers to participate in and contribute to the safe outcome of the flight	3	
(c)	conduct pre-flight passenger safety briefing	3	
(d)	ensure passengers are aware of, and avoid interference with, flight and systems controls	3	
(e)	ensure passengers are aware of, and comply with, the use of seat harnesses	3	
(f)	ensure passengers are aware of the use of escape hatches, exits and emergency equipment on board the aircraft	3	
(g)	manage passenger safety in the event of abnormal or in-flight emergency situations	3	

PLAN AND TRAINING RECORD
RPL(A) 17: FORCED LANDINGS

FLIGHT TRAINING Suggested flight time: 1.0 hour dual			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	 **Achieved***
C5.2	**Aid and assist passengers**		
(a)	establish and maintain clear communications with passengers	3	
(b)	assist with passenger comfort both when airside and in flight	3	
NTS1.4	**Set priorities and manage tasks**		
(d)	use technology to reduce workload and improve cognitive and manipulative activities	3	
NTS1.5	**Maintain effective communications and interpersonal relationships**		
(a)	establish and maintain effective and efficient communications and interpersonal relationships with all stakeholders to ensure the optimum outcome of the flight	3	
(b)	define and explain objectives to stakeholders	3	
(c)	demonstrate a level of assertiveness that ensures the optimum completion of the flight	3	
NTS2.2	**Recognise and manage errors**		
(c)	monitor the following to collect and analyse information to identify potential or actual errors:		
	(i) aircraft systems using a systematic scan technique	3	
	(ii) the flight environment	3	
	(iii) other crew	3	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	 **Achieved**

PLAN AND TRAINING RECORD
RPL(A) 17: FORCED LANDINGS

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 18: STEEP TURNS

Flight no:	RPL(A)18.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- Revise weight and balance, take-off and landing performance calculations, fuel calculations
- 45° angle of bank level turns
- Maximum rate turns – 60° angle of bank
- Minimum radius turns – 60° angle of bank
- Steep gliding turn
- Spiral dive recognition and recovery
- Sideslipping (where flight manual permits)
- Flapless approach and landing
- **Assess:**
  - engine start and shutdown malfunctions and emergencies
  - climbing (cruise and best rate)
  - descending (cruise descent)
  - local area airspace
  - forced landing (simulated complete engine failure)
  - radio failure procedure (inbound from training area)

PRE-FLIGHT KNOWLEDGE
Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Long briefing – Steep Turns

- Review essential knowledge from turning brief
- Aerodynamic forces during a turn
- Bank angle and load factor
- Load factor and effect on stalling speed
- Maximum rate turns (including collision avoidance)
- Minimum radius turns
- Spiral dive – causes, symptoms and recovery technique
- Sideslipping, application, precautions, flight manual limitations
- Attitude flying
- Instrument indications
- Application in flight

LESSON PLAN AND TRAINING RECORD
RPL(A) 18: STEEP TURNS

PRE-FLIGHT KNOWLEDGE
Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Underpinning knowledge
- Review/expand previously introduced knowledge as required
- Radio failure procedures and light signals, including interpretation and actions required [C3 4(f)]
- Hazards when performing performance manoeuvres [A3 4(g)]
- Operational circumstances where steep turns are required [A5 4(a)]
- Aerodynamic and aeroplane operational considerations related to sideslipping, steep turns and upset aeroplane states [A5 4(b)], including but not limited to:
  - relationship between angle of attack and stall
  - effects of weight, ‘g’ force and angle of attack
  - dangers of unbalanced flight
  - symmetrical and rolling ‘g’ force limitations
  - higher stall speeds when aeroplane is turning
  - effects on fuel, pitot and flap systems
- Contents of the flight manual and pilot owner handbook [A5 4(c)]
- Hazards of unbalanced flight [A5 4(g)], hazard of sideslip at low altitude [A6 4(j)]

HF & NTS
- Effective communication under normal and non-normal circumstances [NTS1 4(a), NTS2 4(a)]
- Undesired aeroplane state – prevention, identifying, controlling [NTS2 4(e)]
- How an undesired aeroplane state can develop from unmanaged threat or error [NTS2 4(f)]
- Use of checklists and standard operating procedures to prevent errors [NTS2 4(h)]

Pre-flight briefing
- Review flight sequences, what to expect, see & do
- Check essential knowledge
- Reinforce threat & error management
- Reinforce significant airmanship points

Pre-flight knowledge components complete:	**Instructor’s signature & date**

LESSON PLAN AND TRAINING RECORD
RPL(A) 18: STEEP TURNS

Performance Standard		
3	2	1
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
C2.1	**Pre-flight actions and procedures** *(weight & balance, t/o & ldg performance, fuel requirements)*	3	
A1.1	**Start and stop engine** *(start and stop malfunctions and emergencies)*	**2**	
A3.1	**Climb aeroplane** *(cruise and best rate)*	**2**	
A3.3	**Descend aeroplane** *(powered)*	**2**	
A3.7	**Local area airspace**		
(a)	using an appropriate chart, for the local area and circuit area:		
	(i) identify geographical features	**2**	
	(ii) identify geographical limits	**2**	
	(iii) identify restricted, controlled and uncontrolled airspace areas	**2**	
	(iv) state local airspace limits	**2**	
	(v) identify the transit route between the departure aerodrome and training area	**2**	
	(vi) identify the geographical limits of the training area	**2**	
	(vii) identify aerodromes and landing areas within the local area	**2**	
(b)	maintain orientation and pinpoint location by using geographical features and a local area chart	**2**	
(c)	transit from the circuit area and transit to the designated training area	**2**	
(d)	operate safely within a transit lane (if applicable)	**2**	
(e)	remain clear of restricted, controlled and other appropriately designated airspace	**2**	
(f)	operate safely in the vicinity of local aerodromes and landing areas	**2**	
(g)	transit from the designated training area to the circuit area	**2**	
(h)	set QNH appropriately	**2**	
(i)	correctly determine which runway is to be used for landing	**2**	
(j)	ensure runway is serviceable and available	**2**	
(k)	position aircraft for arrival into the circuit	**2**	
A5.3	**Turn aeroplane steeply**		
(a)	pre-manoeuvre checks for steep turning	3	
(b)	steep level turn using a nominated bank angle, ending on a nominated heading or geographical feature, without altitude change	3	
(c)	steep descending turn using a nominated bank angle, ending on a nominated heading or geographical feature ending on a nominated altitude	3	

LESSON PLAN AND TRAINING RECORD
RPL(A) 18: STEEP TURNS

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
(d)	aeroplane operating limits are not exceeded	3	
A6.6	**Recover from unusual flight attitudes** *(spiral dive recognition and recovery)*		
(a)	identify nose-low unusual attitude flight condition	3	
(b)	recover from nose-low unusual attitudes by adjusting pitch, bank and power to resume controlled and balanced flight	3	
(c)	apply controlled corrective action while maintaining aircraft performance within limits	3	
A5.4	**Sideslip aeroplane (where flight manual permits)**		
(a)	straight sideslip:		
	(i) induce slip to achieve increased rate of descent while maintaining track and airspeed	3	
	(ii) adjust rate of descent by coordinating angle of bank and applied rudder	3	
(b)	sideslipping turn by adjusting the bank angle to turn through minimum heading change of 90° at constant airspeed using sideslip, and exiting the turn on a specified heading or geographical feature, within tolerance	3	
(c)	recover from a sideslip and return the aeroplane to balanced flight	3	
A6.3	**Perform forced landing (simulated)**		
(a)	after a simulated complete engine failure has occurred, without prior indications, carry out the following:		
	(i) identify complete power failure condition and control aeroplane	**2**	
	(ii) perform immediate actions	**2**	
	(iii) formulate and describe a recovery plan, including selecting the most suitable landing area	**2**	
	(iv) establish optimal gliding flight path to position the aeroplane for a landing on the selected landing area	**2**	
	(v) perform emergency procedures and land the aeroplane if the engine cannot be restarted as time permits	**2**	
	(vi) advise ATS or other agencies capable of providing assistance of situation and intentions	**2**	
	(vii) re-brief passengers about flight situation, brace position and harness security	**2**	
	(viii) land the aeroplane ensuring safest outcome if an engine restart is not achieved	**2**	
C3.2	**Manage R/T equipment malfunctions**		
(a)	perform radio failure procedures	**2**	
(b)	use fault finding procedures and perform corrective actions	**2**	
A4.1	**Land aeroplane** *(revise flapless approach and landing)*	2	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

LESSON PLAN AND TRAINING RECORD
RPL(A) 18: STEEP TURNS

CONSOLIDATION AND/OR REMEDIAL TRAINING			
		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 19: CROSSWIND CIRCUITS

Flight no:	RPL(A)19.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Crosswind circuits
- Review missed approach and recovery from missed landing
- Review engine failure after take-off and in the circuit area
- **Assess:**
  - local observations, use of weather forecasts
  - refuelling
  - crosswind take-off and landing
  - operational communication
  - NTS lookout, effective communications and interpersonal relationships

PRE-FLIGHT KNOWLEDGE
Long Briefing: 0.5 hour Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Long briefing – Crosswind Circuits
- Check essential knowledge from circuits briefing
- Aeroplane crosswind limitations/maximum demonstrated crosswind
- Company crosswind limitations, personal limitation
- Drift compensation considerations
- Calculation of crosswind component for landing
- Crosswind take-off, approach and landing technique

Underpinning knowledge
- Review/expand previously introduced knowledge as required
- Obtaining or calculating the crosswind and down or upwind components [A2 4(a)]
- Interpreting windsock indications and determining wind direction and speed [A2 4(c)]
- Dangers associated with mechanical and wake turbulence [A3 4(k)]
- Aeroplane limitations [A4 4(c)]
- Options when local conditions are not suitable for landing [A4 4(e)]
- Causes of loss of control of aeroplane on landing [A4 4(f)]
- Contents of the aircraft flight manual and pilot's operating handbook [A4 4(g)]

HF & NTS
- Effective communication under normal and non-normal circumstances [NTS1 4(a), NTS2 4(a)]
- Undesired aeroplane state – prevention, identifying, controlling [NTS2 4(e)]
- How an undesired aeroplane state can develop from unmanaged threat or error [NTS2 4(f)]

LESSON PLAN AND TRAINING RECORD
RPL(A) 19: CROSSWIND CIRCUITS

PRE-FLIGHT KNOWLEDGE Long Briefing: 0.5 hour Pre-flight Briefing: 0.3 hour Underpinning knowledge: as required	
Content	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	2	1
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
C2.1	**Pre-flight actions and procedures**		
(b)	obtain, interpret and apply information contained in the required pre-flight operational documentation, including the following:		
	(iii) weather forecasts	**2**	
	(iv) local observations	**2**	
C4.3	**Refuel aircraft**	2	
A2.3	**Take off aeroplane in a crosswind**		
(a)	perform a take-off in an aeroplane making appropriate adjustments for the crosswind conditions	**2**	
(b)	maintain the runway centreline and extended centreline	**2**	
A6.1	**Manage engine failure - take-off (simulated)**	2	
(g)	ensure passengers adopt brace position	3	
A3.6	**Perform circuits and approaches**	2	
A6.2	**Manage engine failure in the circuit area (simulated)**	2	
(g)	re-brief passengers about flight situation, brace position and harness security	3	
C1.2	**Operational communication using an aeronautical radio**		
(b)	communicate effectively in unfamiliar, stressful or non-standard situations	**2**	
(l)	communicate effectively in unexpected, stressful or non-standard situations using standard phraseology or plain English	**2**	

LESSON PLAN AND TRAINING RECORD
RPL(A) 19: CROSSWIND CIRCUITS

FLIGHT TRAINING Suggested flight time: 1.0 hour dual		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved*
NTS1.1	**Maintain effective lookout**		
(a)	maintain traffic separation using a systematic visual scan technique at a rate determined by traffic density, visibility and terrain	1	
(b)	maintain radio listening watch and interpret transmissions to determine traffic location and intentions	1	
(c)	perform airspace-cleared procedure before commencing any manoeuvre	1	
NTS1.5	**Maintain effective communications and interpersonal relationships**		
(a)	establish and maintain effective and efficient communications and interpersonal relationships with all stakeholders to ensure the optimum outcome of the flight	2	
(b)	define and explain objectives to stakeholders	2	
(c)	demonstrate a level of assertiveness that ensures the optimum completion of the flight	2	
A4.2	**Land aeroplane in a crosswind**		
(a)	verify existing wind conditions, make proper correction for drift, and maintain a precise ground track	2	
(b)	configure the aeroplane for the crosswind conditions	2	
(c)	control the aeroplane during the transition from final approach to touchdown and during after-landing roll to compensate for the crosswind conditions	2	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved

LESSON PLAN AND TRAINING RECORD
RPL(A) 19: CROSSWIND CIRCUITS

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 20: PRE TRAINING AREA SOLO

Flight no:	RPL(A)20.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Revise and **assess**:
  - forced landing
  - steep turns
  - sideslipping (where flight manual permits)
  - advanced stalling, incipient spins
  - recovery from unusual flight attitudes
  - operational communication, radio failure procedure (inbound from training area)
  - NTS lookout, effective communications and interpersonal relationships
  - crosswind take-off and landing
  - local area airspace

PRE-FLIGHT KNOWLEDGE
Long Briefing: as required   Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Long briefing
- Sequences to be reviewed and assessed
- Emphasise restrictions and limitations when practising sequences solo
- Local area operating procedures and weather considerations
- Others as required

Underpinning knowledge
- Assess previously introduced underpinning knowledge

HF & NTS
- Effective communication under normal and non-normal circumstances [NTS1 4(a), NTS2 4(a)]
- Threat and error management detailing processes that can be used to identify and mitigate or control threats and errors [NTS2 4(b)]
- Undesired aeroplane state – prevention, identifying, controlling [NTS2 4(e)]

Pre-flight briefing
- Review flight sequences, what to expect, see & do
- Check essential knowledge
- Reinforce threat & error management
- Reinforce significant airmanship points

LESSON PLAN AND TRAINING RECORD
RPL(A) 20: PRE TRAINING AREA SOLO

PRE-FLIGHT KNOWLEDGE **Long Briefing: as required Pre-flight Briefing: 0.3 hour** **Underpinning knowledge: as required**	
Content	
Theory examination • Ensure pre-training area solo theory examination has been completed prior to commencing this training session	
Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	2	1
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual

MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
C2.1	**Pre-flight actions and procedures** *(weather forecast, location observations)*	2	
A2.3	**Take off aeroplane in a crosswind**	2	
C1.2	**Operational communication using an aeronautical radio**	2	
A5.1	**Enter and recover from stall** *(stall with full power, climbing, descending, turning, simulated partial and complete engine failure configurations)*	2	
A5.2	**Recover from incipient spin** *(from straight & level flight, climbing, turning)*	2	
A5.3	**Turn aeroplane steeply**		
(a)	pre-manoeuvre checks for steep turning	2	
(b)	steep level turn using a nominated bank angle, ending on a nominated heading or geographical feature, without altitude change	2	
(c)	steep descending turn using a nominated bank angle, ending on a nominated heading or geographical feature ending on a nominated altitude	2	
(d)	aeroplane operating limits are not exceeded	2	
A6.6	**Recover from unusual flight attitudes**		
(a)	identify nose-high or nose-low unusual attitude flight condition	2	
(b)	recover from nose-low or nose-high unusual attitudes by adjusting pitch, bank and power to resume controlled and balanced flight	2	
(c)	apply controlled corrective action while maintaining aircraft performance within limits	2	

LESSON PLAN AND TRAINING RECORD
RPL(A) 20: PRE TRAINING AREA SOLO

FLIGHT TRAINING Suggested flight time: 1.0 hour dual			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** Required	Achieved*
A6.3	**Perform forced landing (simulated)** *(complete engine failure)*	2	
A5.4	**Sideslip aeroplane (where flight manual permits)**		
(a)	straight sideslip:		
	(i) induce slip to achieve increased rate of descent while maintaining track and airspeed	2	
	(ii) adjust rate of descent by coordinating angle of bank and applied rudder	2	
(b)	sideslipping turn by adjusting the bank angle to turn through minimum heading change of 90° at constant airspeed using sideslip, and exiting the turn on a specified heading or geographical feature, within tolerance	2	
(c)	recover from a sideslip and return the aeroplane to balanced flight	2	
A3.7	**Local area airspace**	2	
NTS1.1	**Maintain effective lookout**	1	
NTS1.5	**Maintain effective communications and interpersonal relationships**	2	
C3.2	**Manage R/T equipment malfunctions**	2	
A4.2	**Land aeroplane in a crosswind**	2	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** Required	Achieved

LESSON PLAN AND TRAINING RECORD
RPL(A) 20: PRE TRAINING AREA SOLO

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to first training area solo flight?#	**Yes**	**No**

 # The trainee must be assessed as capable of conducting the first area solo flight safely. The requirements of CASR Parts 61 and 141 must also be met.

Instructor's signature & date	**Trainee's signature & date**

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 21: FIRST TRAINING AREA SOLO

Flight no:	RPL(A)21	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- Perform practice forced landings solo, in accordance with the limitations and guidelines advised by the authorising flight instructor
- **Suggested flight time: 1.0 hour**

Operational Limitations:

During solo flight, trainees must only be authorised to practise sequences that have been assessed to performance standard 2 or 1, on a minimum of two separate flights.

Except in emergency or urgency situations, or in the interests of maintaining safety, the trainee must not operate contrary to the limitations and guidelines specified by the authorising flight instructor.

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

**Recreational Pilot Licence – Aeroplane Category Rating
and Flight Radio Endorsement**

**LESSON PLAN AND TRAINING RECORD
RPL(A) 22: CIRCUITS – SHORT FIELD TAKE-OFF AND LANDING**

Flight no:	RPL(A)22.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Pre-flight actions and procedures – MEL, NOTAMs, GNSS (if applicable), ERSA, AIP
- Circuits – 'short field' take-off and landing
- Revise circuit emergencies
- **Assess:**
  - weight and balance, take-off and landing performance charts, fuel requirement calculations
  - best angle climb

PRE-FLIGHT KNOWLEDGE Long Briefing: 0.5 hour Pre-flight Briefing: 0.3 hour Underpinning knowledge: as required
Content
Long briefing – Short field take off and landings • Check essential knowledge from circuits and circuit emergency briefs • Factors affecting take-off and landing performance and the distance required • Factors affecting climb performance, missed approach performance and obstacle clearance • Calculating headwind and crosswind components • Calculating take-off and landing run and distance required
Underpinning knowledge • Review/expand previously introduced knowledge as required • Factors affecting length of take-off and landing run & distance • Contents of the flight manual and pilot operating handbook for the aircraft being flown [A1 4(g)] • Relevant sections of the AIP [A1 4(n)] • Aeroplane performance [A4 4(b)] • Minimum equipment list [C2 4(c)]
HF & NTS • Effective communication under normal and non-normal circumstances [NTS1 4(a), NTS2 4(a)] • Undesired aeroplane state – prevention, identifying, controlling [NTS2 4(e)] • How an undesired aeroplane state can develop from unmanaged threat or error [NTS2 4(f)] • Use of checklists and standard operating procedures to prevent errors [NTS2 4(h)] • Task management [NTS2 4(i)]

LESSON PLAN AND TRAINING RECORD
RPL(A) 22: CIRCUITS – SHORT FIELD TAKE-OFF AND LANDING

PRE-FLIGHT KNOWLEDGE **Long Briefing: 0.5 hour Pre-flight Briefing: 0.3 hour** **Underpinning knowledge: as required**	
Content	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual

MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** Required	**Performance Standard** Achieved*
C2.1	**Pre-flight actions and procedures**		
(b)	obtain, interpret and apply information contained in the required pre-flight operational documentation, including the following:		
	(i) minimum equipment list (MEL)	3	
	(v) Notice to Airmen (NOTAM)	3	
	(vi) global navigation satellite system (GNSS) receiver autonomous integrity monitoring (RAIM) information	3	
	(vii) En Route Supplement Australia (ERSA)	3	
	(viii) Aeronautical Information Package (AIP)	3	
(f)	using the aircraft documents, calculate the following for a given set of environmental and operational conditions:		
	(i) weight and balance	2	
	(iii) take-off and landing performance	2	
	(iv) fuel requirements	2	
A2.5	**Take off aeroplane from 'short field'**		
(a)	calculate take-off and landing performance in accordance with the aeroplane's performance charts	3	
(b)	perform take-off aeroplane to achieve the minimum length take-off performance	3	
(c)	perform take-off aeroplane to achieve the obstacle clearance parameters	3	

LESSON PLAN AND TRAINING RECORD
RPL(A) 22: CIRCUITS – SHORT FIELD TAKE-OFF AND LANDING

FLIGHT TRAINING **Suggested flight time: 1.0 hour dual**			
		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Required**	**Achieved***
A3.1	**Climb aeroplane**		
(a)	for the following climbing manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) best angle climb	**2**	
A6.1	**Manage engine failure - take-off (simulated)**	2	
A6.2	**Manage engine failure in the circuit area (simulated)**	2	
A4.5	**Short landing**		
(a)	land aeroplane at nominated touchdown point at minimum speed	3	
(b)	control ballooning during flare	3	
(c)	control bouncing after touchdown	3	
(d)	maintain direction after touchdown	3	
(e)	apply maximum braking without locking up wheels	3	
(f)	stops aircraft within landing distance available	3	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING			
		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Required**	**Achieved**

LESSON PLAN AND TRAINING RECORD
RPL(A) 22: CIRCUITS – SHORT FIELD TAKE-OFF AND LANDING

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 23: CONSOLIDATION

Flight no:	RPL(A)23.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Manage fuel system - fuel log, best endurance configuration, calculating endurance
- Revise:
  - forced landing – simulated partial engine failure
  - abnormal situations (e.g. simulated electrical failure)
  - stalling, incipient spin
- **Assess**:
  - 'short field' take-off and landing
  - best angle climb
  - steep turns, sideslipping
  - recovery from unusual flight attitudes

PRE-FLIGHT KNOWLEDGE **Long Briefing: as required Pre-flight Briefing: 0.3 hour** **Underpinning knowledge: as required**	
Content	
Long briefing – as required	
Underpinning knowledge • Review/expand previously introduced knowledge as required • Minimum equipment list [C2 4(c)], airworthiness requirements applicable to category, class or type [C2 4(d)] • Characteristics of radio waves, wave propagation, transmission and reception [C3 4(d)(i)-(v)] • Contents of the flight manual and pilot operating handbook for the aircraft being flown [A1 4(g), A4 4(g)] • Relevant sections of the AIP [A1 4(n), A3 4(q), A4 4(k), A5 4(f)]	
HF & NTS • Undesired aeroplane state – prevention, identifying, controlling [NTS2 4(e)] • How an undesired aeroplane state can develop from unmanaged threat or error [NTS2 4(f)] • Task management [NTS2 4(i)]	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

LESSON PLAN AND TRAINING RECORD
RPL(A) 23: CONSOLIDATION

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved*
C2.1	**Pre-flight actions and procedures** *(MEL, NOTAM, GNSS RAIM information, ERSA, AIP)*	3	
C2.2	**Perform pre-flight inspection**		
(d)	report to, and seek advice from, qualified personnel to determine the action required in relation to any identified defects or damage	3	
(f)	certify the aircraft flight technical log entering any defects or endorsements to permissible unserviceabilities as appropriate	3	
(g)	complete and certify the daily inspection (if authorised to do so)	3	
C5.3	**Manage cargo**		
(a)	manage loading, unloading and security of cargo during flight operations	3	
(b)	identify dangerous goods and apply procedures to ensure safety and security	3	
A2.5	**Take off aeroplane from ‘short field’**		
(a)	calculate take-off and landing performance in accordance with the aeroplane's performance charts	**2**	
(b)	perform take-off aeroplane to achieve the minimum length take-off performance	**2**	
(c)	perform take-off aeroplane to achieve the obstacle clearance parameters	**2**	
A3.1	**Climb aeroplane** *(best angle climb)*	**2**	
A5.1	**Enter and recover from stall** *(revise incipient stall, stall with full power, climbing, descending, turning, simulated partial & complete engine failure configurations)*	2	
A5.2	**Recover from incipient spin**	2	
A5.3	**Turn aeroplane steeply**	**2**	
A5.4	**Sideslip aeroplane (where flight manual permits)**	**2**	
A6.3	**Perform forced landing (simulated)** *(revise simulated partial engine failure)*	2	
A6.5	**Manage other abnormal situations (simulated)** *(e.g. simulated electrical failure)*	3	
A6.6	**Recover from unusual flight attitudes** *(nose-high and nose-low)*	**2**	
C4.2	**Manage fuel system**		
(f)	accurately maintain fuel log	3	
(g)	calculate and state endurance at any point during flight	3	
(m)	configure the aircraft correctly to achieve best endurance performance and correctly calculate the revised operational endurance	3	

LESSON PLAN AND TRAINING RECORD
RPL(A) 23: CONSOLIDATION

FLIGHT TRAINING Suggested flight time: 1.0 hour dual			
MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
A4.5	**Short landing**		
(a)	land aeroplane at nominated touchdown point at minimum speed	**2**	
(b)	control ballooning during flare	**2**	
(c)	control bouncing after touchdown	**2**	
(d)	maintain direction after touchdown	**2**	
(e)	apply maximum braking without locking up wheels	**2**	
(f)	stops aircraft within landing distance available	**2**	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING			
MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Achieved

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

LESSON PLAN AND TRAINING RECORD
RPL(A) 23: CONSOLIDATION

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 24: PRECAUTIONARY SEARCH AND LANDING

Flight no:	RPL(A)24.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- Precautionary search & landing
- Fuel log, best endurance configuration, calculating endurance
- Abnormal situations (e.g. low fuel situation, deteriorating weather)
- **Assess:**
  - Pre-flight actions and procedures – MEL, NOTAMs, GNSS (if applicable), ERSA, AIP
  - 'Short field' take-off and landing

PRE-FLIGHT KNOWLEDGE
Long Briefing: 0.5 hour   Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Long briefing – Precautionary search & landing

- Circumstances which may require a precautionary landing
- Importance of proper planning and early decision making
- Aeroplane configuration – precautionary/poor visibility cruise
- Landing area/field selection
- Obstacle, terrain and turbulence awareness
- Wind awareness – judging direction and strength
- Low flying considerations and hazards
- Turning illusions
- Planning the search, approach and landing
- Vital actions
- Radio procedures (PAN call)
- Passenger management
- Actions after landing

Underpinning knowledge

- Review/expand previously introduced knowledge as required
- Variations to planned fuel consumption [C4 4(h)]
- Contents of the aircraft flight manual and pilot's operating handbook [A3 4(m), A4 4(g), A6 4(l)]
- Causes leading to precautionary landings [A6 4(c)]
- Suitable fields for forced landings and precautionary landings [A6 4(g)]
- Considerations when practising emergencies/ non-normal operations [A6 4(h)], Low flying hazards [A6 4(o)]
- VMC [A4 4(h), A6 4(n)], Day VFR flight rules [A4 4(i)]

LESSON PLAN AND TRAINING RECORD
RPL(A) 24: PRECAUTIONARY SEARCH AND LANDING

PRE-FLIGHT KNOWLEDGE **Long Briefing: 0.5 hour Pre-flight Briefing: 0.3 hour** **Underpinning knowledge: as required**	
Content	
HF & NTS • Effective communication under normal and non-normal circumstances [NTS1 4(a), NTS2 4(a)] • Threat and error management detailing processes that can be used to identify and mitigate or control threats and errors [NTS2 4(b)] • Undesired aeroplane state – prevention, identifying, controlling [NTS2 4(e)] • How an undesired aeroplane state can develop from unmanaged threat or error [NTS2 4(f)] • Task management [NTS2 4(i)]	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual

MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** Required	**Performance Standard** Achieved*
C2.1	**Pre-flight actions and procedures**		
(b)	obtain, interpret and apply information contained in the required pre-flight operational documentation, including the following:		
	(i) minimum equipment list (MEL)	2	
	(v) Notice to Airmen (NOTAM)	2	
	(vi) global navigation satellite system (GNSS) receiver autonomous integrity monitoring (RAIM) information	2	
	(vii) En Route Supplement Australia (ERSA)	2	
	(viii) Aeronautical Information Package (AIP)	2	
C2.2	**Perform pre-flight inspection**		
(d)	report to, and seek advice from, qualified personnel to determine the action required in relation to any identified defects or damage	3	
(f)	certify the aircraft flight technical log entering any defects or endorsements to permissible unserviceabilities as appropriate	3	

LESSON PLAN AND TRAINING RECORD
RPL(A) 24: PRECAUTIONARY SEARCH AND LANDING

FLIGHT TRAINING **Suggested flight time: 1.0 hour dual**			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** Required	Achieved*
(g)	complete and certify the daily inspection (if authorised to do so)	3	
C5.3	**Manage cargo**	3	
A2.5	**Take off aeroplane from 'short field'**	**2**	
A6.4	**Conduct precautionary search and landing (simulated condition)**		
(a)	assess flight circumstances and make an appropriate decision when to perform precautionary landing	3	
(b)	configure aeroplane for conditions	3	
(c)	perform precautionary search procedure	3	
(d)	select landing area, carry out an inspection and assess its suitability for landing, taking into account:		
	(i) unobstructed approach and overshoot paths	3	
	(ii) landing area length adequate for landing	3	
	(iii) landing area surface is suitable for aeroplane type and clear of hazards	3	
(e)	maintain orientation and visual contact with the landing area	3	
(f)	advise ATS or other agencies capable of providing assistance of situation and intentions	3	
(g)	re-brief passengers about flight situation, brace position and harness security	3	
(h)	land and secure aircraft and manage passengers	3	
A6.5	**Manage other abnormal situations (simulated)** *(e.g. low fuel situation, deteriorating weather)*	3	
C4.2	**Manage fuel system** *(maintain fuel log, endurance calculations, configure for best endurance)*	3	
A4.5	**Short landing**	**2**	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** Required	Achieved

LESSON PLAN AND TRAINING RECORD
RPL(A) 24: PRECAUTIONARY SEARCH AND LANDING

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 25: SOLO CONSOLIDATION

Flight no:	RPL(A)25.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- Practice forced landing
- Basic stalls (entry from straight & level without power applied, approach to land configuration)
- Steep level turns
- **Suggested flight time: 1.0 hour**

Operational Limitations:

During solo flight, trainees must only be authorised to practise sequences that have been assessed to performance standard 2 or 1, on a minimum of two separate flights.

Except in emergency or urgency situations, or in the interests of maintaining safety, the trainee must not operate contrary to the limitations and guidelines specified by the authorising flight instructor.

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 26: BASIC INSTRUMENT FLIGHT

Flight no:	RPL(A)26.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Basic instrument flight
- Recognition of and recovery from upset situations and unusual attitudes
- Actions upon inadvertent entry into IMC
- **Assess:**
  - communicating face-to-face
  - pre-flight actions and procedures, pre-flight inspection
  - start and stop engine
  - taxiing
  - pre-take off procedures
  - operational communication, operate radio equipment, operate transponder
  - post-flight actions and procedures

PRE-FLIGHT KNOWLEDGE
Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Long briefing – Basic instrument flight
- Instrument power sources
- Instrument checks & serviceability
- Control and performance instruments
- Instrument lag
- Sensory illusions
- Scan technique
- Dangers associated with attempting VFR flight into deteriorating weather
- Importance of proper pre-flight preparation and planning to avoid inadvertent entry into IMC
- Actions upon inadvertent entry into IMC
- Compass turning and acceleration errors
- Unusual attitudes – instrument indications, recovery techniques

Underpinning knowledge
- Review/expand previously introduced knowledge as required
- Scan technique appropriate to fitted flight instruments and phase of flight [IFF 4(a)]
- Attitude and power requirements to achieve specified flight profiles [IFF 4(b)]
- Instrument failure and warning systems fitted to the aeroplane [IFF 4(c)]
- Turning using a magnetic compass [A3 4(h)]
- Environmental conditions that represent VMC [A4 4(h), A5 4(d)], Day VFR flight rules [A4 4(i), A5 4(e)]

LESSON PLAN AND TRAINING RECORD
RPL(A) 26: BASIC INSTRUMENT FLIGHT

PRE-FLIGHT KNOWLEDGE **Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour** **Underpinning knowledge: as required**
Content
HF & NTS • Threat and error management detailing processes that can be used to identify and mitigate or control threats and errors [NTS2 4(b)] • The application of situational awareness to identifying real or potential environmental or operational threats to flight safety [NTS2 4(c)] • Developing and implementing plans of action for the following [NTS2 4(d)]: − removing and mitigating threats − removing and mitigating errors • Undesired aeroplane state – prevention, identifying, controlling [NTS2 4(e)] • How an undesired aeroplane state can develop from unmanaged threat or error [NTS2 4(f)]
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points

Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual (0.6 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
C1.1	**Communicating face-to-face**		
(a)	pronounces words clearly, using an accent that does not cause difficulties in understanding	1	
(b)	conveys information in clearly structured sentences without confusion or ambiguity	1	
(c)	uses an extensive vocabulary to accurately communicate on general and technical topics, without excessive use of jargon, slang or colloquial language	1	
(d)	speaks fluently without long pauses, repetition or excessive false starts	1	
(e)	responds to communications with actions that demonstrate that the information has been received and understood	1	
(f)	exchanges information clearly in a variety of situations with both expert and non-expert English speakers while giving and receiving timely and appropriate responses	1	
(g)	uses appropriate techniques to validate communications	1	

LESSON PLAN AND TRAINING RECORD
RPL(A) 26: BASIC INSTRUMENT FLIGHT

MOS Reference	**FLIGHT TRAINING** Suggested flight time: 1.0 hour dual (0.6 IF) Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
C1.2	**Operational communication using an aeronautical radio**		
(a)	maintain effective communication with others on operational matters	1	
(b)	communicate effectively in unfamiliar, stressful or non-standard situations	1	
(c)	apply the phonetic alphabet	1	
(d)	transmit numbers	1	
(e)	make appropriate transmissions using standard aviation phraseology	1	
(f)	use plain English effectively when standard phraseology is inadequate	1	
(g)	receive appropriate responses to transmissions	1	
(h)	respond to transmissions and take appropriate action	1	
(i)	recognise and manage communication errors and misunderstandings effectively	1	
(j)	seek clarification in the time available if a message is unclear or uncertainty exists	1	
(k)	react appropriately to a variety of regional accents	1	
(l)	communicate effectively in unexpected, stressful or non-standard situations using standard phraseology or plain English	1	
C2.1	**Pre-flight actions and procedures**		
(a)	complete all required pre-flight administration documentation	1	
(b)	obtain, interpret and apply information contained in the required pre-flight operational documentation, including the following:		
	(i) minimum equipment list (MEL)	1	
	(ii) maintenance release	1	
	(iii) weather forecasts	1	
	(iv) local observations	1	
	(v) Notice to Airmen (NOTAM)	1	
	(vi) global navigation satellite system (GNSS) receiver autonomous integrity monitoring (RAIM) information	1	
	(vii) En Route Supplement Australia (ERSA)	1	
	(viii) Aeronautical Information Package (AIP)	1	
(c)	identify special aerodrome procedures	1	
(d)	identify all relevant radio and navigation aid facilities to be used during the flight (if applicable)	1	
(e)	determine the suitability of the current and forecast weather conditions for the proposed flight	1	
(f)	using the aircraft documents, calculate the following for a given set of environmental and operational conditions:		
	(i) weight and balance	1	
	(iii) take-off and landing performance	1	
	(iv) fuel requirements	1	
(g)	determine whether the aircraft is serviceable for the proposed flight	1	
C2.2	**Perform pre-flight inspection**		
(a)	identify and secure equipment and documentation that is required for the flight	1	
(b)	complete an internal and external check of the aircraft	1	
(c)	identify all defects or damage to the aircraft	1	
(d)	report to, and seek advice from, qualified personnel to determine the action required in relation to any identified defects or damage	1	
(e)	ensure all aircraft locking and securing devices, covers and bungs are removed and stowed securely	1	

LESSON PLAN AND TRAINING RECORD
RPL(A) 26: BASIC INSTRUMENT FLIGHT

FLIGHT TRAINING Suggested flight time: 1.0 hour dual (0.6 IF)			
MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	 Achieved*
(f)	certify the aircraft flight technical log entering any defects or endorsements to permissible unserviceabilities as appropriate	1	
(g)	complete and certify the daily inspection (if authorised to do so)	1	
A1.1	**Start and stop engine**		
(a)	perform engine start and after start actions	1	
(b)	perform engine shutdown and after shutdown actions	1	
(c)	manage engine start and shutdown malfunctions and emergencies	1	
(d)	considers ground surface in relation to contamination and propeller care during engine start and stop activities	1	
A1.2	**Taxi aeroplane**		
(a)	use aerodrome or landing area charts to taxi aircraft	1	
(b)	comply with taxiway and other aerodrome markings, right-of-way rules and ATC or marshalling instructions when applicable	1	
(c)	perform applicable taxi checks, including the following:		
	(i) brakes and steering function normally and take appropriate action in the event of a malfunction	1	
	(ii) instruments for correct readings	1	
	(iii) altimeter setting	1	
(d)	maintain safe taxi speed and control of the aircraft	1	
(e)	maintain safe spacing from other aircraft, obstructions, and persons	1	
(f)	taxi the aeroplane along the centre of the taxiway	1	
(g)	avoid causing a hazard to other aircraft, objects or persons	1	
(h)	correct handling techniques are applied to take into account wind from all four quadrants	1	
(i)	correctly manage the engine during taxi manoeuvres	1	
A2.1	**Carry out pre take-off procedures**		
(a)	correctly identify critical airspeeds, configurations, and emergency and abnormal procedures for normal and crosswind take-offs	1	
(b)	work out a plan of action, in advance, to ensure the safest outcome in the event of abnormal operations	1	
(c)	verify and correctly apply correction for the existing wind component to the take-off performance	1	
(d)	perform all pre take-off and line-up checks required by the aircraft checklist	1	
(e)	ensure approach path is clear of conflicting traffic and other hazards before lining up for take-off	1	
(f)	align the aeroplane on the runway centreline	1	
C3.1	**Operate radio equipment**		
(a)	confirm serviceability of radio equipment	1	
(b)	conduct transmission and receipt of radio communications using appropriate procedures and phraseology	1	
(c)	maintain a listening watch and respond appropriately to applicable transmissions	1	
(d)	conduct appropriate emergency and urgency transmissions	1	
C3.3	**Operate transponder**		
(a)	operate a transponder during normal, abnormal and emergency operations	1	
(b)	recall transponder emergency codes	1	
IFF.1	**Determine and monitor the serviceability of flight instruments and instrument power sources**		
(a)	determine serviceability of flight and navigational instruments	3	
(b)	perform functional checks of flight and navigational instruments where applicable prior to take-off	3	

LESSON PLAN AND TRAINING RECORD
RPL(A) 26: BASIC INSTRUMENT FLIGHT

FLIGHT TRAINING **Suggested flight time: 1.0 hour dual (0.6 IF)**		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Required**	**Achieved***
(c)	monitor flight instrument and instrument power sources and react to any warnings, unserviceability or erroneous indications	3	
IFF.2	**Perform manoeuvres using full instrument panel**		
(a)	interpret flight instrument indications and apply procedures and techniques to achieve and maintain a specified flight path using the aircraft's full instrument panel	3	
(c)	set and maintain power and attitude by reference to the full instrument panel to establish a rate 1 turn onto a nominated heading within the flight tolerances	3	
IFF.3	**Recover from upset situations and unusual attitudes**		
(a)	correctly identify upset situations and unusual attitudes under simulated IMC	3	
(b)	recover to controlled flight from upset situations and unusual attitudes under simulated IMC from any combination of the following aircraft states:		
	(i) high and low-nose attitudes	3	
	(ii) varying angles of bank	3	
	(iii) various power settings	3	
	(iv) various aircraft configurations	3	
	(v) unbalanced flight	3	
C2.3	**Post-flight actions and procedures**		
(a)	shut down aircraft	1	
(b)	conduct post-flight inspection and secure the aircraft (if applicable)	1	
(c)	complete all required post-flight administration documentation	1	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Required**	**Achieved**

LESSON PLAN AND TRAINING RECORD
RPL(A) 26: BASIC INSTRUMENT FLIGHT

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

	Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 27: CONSOLIDATION

Flight no:	RPL(A)27.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- Consolidation:
  - basic instrument flight, including actions in event of inadvertent entry into IMC
  - forced landing – simulated complete engine failure
  - precautionary search and landing
  - abnormal situations – unreliable airspeed indication
  - ‘short field’ landing
- **Assess:**
  - communicating face-to-face
  - plan fuel requirements, refuelling, manage fuel system
  - pre-flight actions and procedures, pre-flight inspection
  - start and stop engine
  - taxiing
  - pre-take off procedures
  - simulated engine failure on take-off
  - operational communication, operate radio equipment, operate transponder
  - climbing, straight and level, descending, turning
  - local area airspace
  - post-flight actions and procedures
- Flight manoeuvres to be performed within the flight tolerances mentioned in Schedule 8 of the Part 61 MOS

PRE-FLIGHT KNOWLEDGE **Long Briefing: as required Pre-flight Briefing: 0.3 hour** **Underpinning knowledge: as required**
Content
Long briefing – Revision as required
Underpinning knowledge • Review/expand previously introduced knowledge as required
HF & NTS • Review as required
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points

PLAN AND TRAINING RECORD
RPL(A) 27: CONSOLIDATION

PRE-FLIGHT KNOWLEDGE Long Briefing: as required Pre-flight Briefing: 0.3 hour Underpinning knowledge: as required	
Content	
Theory examinations • The RPLA Aeronautical Knowledge Examination should be passed prior to lesson RPL(A)29, and must be passed prior to the RPL(A) flight test. • The RPL Flight Radio Operator Examination should be passed prior to the RPL(A) flight test, and must be passed prior to the issue of the RPL flight radio endorsement. The trainee must also hold a current aviation English language proficiency assessment for the issue of the RPL flight radio endorsement. • Where the trainee achieves a pass of less than 100% in the above examinations, a knowledge deficiency report (KDR) assessment is to be conducted by an authorised flight instructor	
Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual (0.2 IF)

MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
C1.1	**Communicating face-to-face**	1	
C1.2	**Operational communication using an aeronautical radio**	1	
C2.1	**Pre-flight actions and procedures**	1	
C4.1	**Plan fuel requirements**		
(a)	determine the required fuel reserves	1	
(b)	determine the quantity of fuel required taking into account operational requirements and relevant abnormal or emergency conditions and contingencies	1	
(c)	determine the total fuel required for the flight	1	
C4.2	**Manage fuel system**		
(a)	verify fuel quantity on-board aircraft prior to flight using two independent methods	1	
(b)	ensure the fuel caps are secured	1	
(c)	perform fuel quality check prior to flight	1	
(d)	ensure fuel drain cocks are closed	1	
(e)	monitor fuel usage during the flight	1	
(f)	accurately maintain fuel log	1	

PLAN AND TRAINING RECORD
RPL(A) 27: CONSOLIDATION

FLIGHT TRAINING Suggested flight time: 1.0 hour dual (0.2 IF)			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
(g)	calculate and state endurance at any point during flight	1	
(h)	perform fuel tank changes correctly	1	
(i)	maintain fuel load within aircraft limits	1	
(j)	operate the fuel cross-feed system correctly (if fitted)	1	
(k)	operate fuel pumps and engine controls correctly	1	
(m)	configure the aircraft correctly to achieve best endurance performance and correctly calculate the revised operational endurance	1	
C4.3	**Refuel aircraft**		
(a)	identify the correct type of fuel to be used	1	
(b)	ensure aircraft is earthed prior to refuelling and defueling operations	1	
(c)	correctly load and unload fuel	1	
(d)	ensure required fuel quantity is loaded	1	
(e)	ensure fuel caps are closed and secured after fuelling operations	1	
(f)	perform fuel quality checks	1	
C2.2	**Perform pre-flight inspection**	1	
A1.1	**Start and stop engine**	1	
A1.2	**Taxi aeroplane**	1	
A2.1	**Carry out pre take-off procedures**	1	
A6.1	**Manage engine failure - take-off (simulated)**		
(a)	correctly identify an engine failure after take-off	1	
(b)	apply the highest priority to taking action to control the aeroplane	1	
(c)	maintain control of the aeroplane	1	
(d)	perform recall actions	1	
(e)	perform emergency actions as far as time permits	1	
(f)	manoeuvre the aeroplane to achieve the safest possible outcome	1	
(g)	ensure passengers adopt brace position	1	
(h)	advise others such as ATS and other aircraft of intentions if time permits	1	
A3.1	**Climb aeroplane**		
(a)	operate and monitor all aircraft systems when commencing, during, and completing a climbing flight manoeuvre	1	
(b)	adjust altimeter subscale according to applicable settings	1	
(c)	identify and avoid terrain and traffic	1	
(d)	for the following climbing manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) cruise climb	1	
	(ii) best angle climb	1	
	(iii) best rate climb	1	
(e)	anticipate level-off altitude and achieve straight and level flight	1	
A3.2	**Maintain straight and level flight**		
(a)	operate and monitor all aircraft systems during straight and level flight manoeuvres	1	
(b)	adjust altimeter subscale according to applicable settings	1	

PLAN AND TRAINING RECORD
RPL(A) 27: CONSOLIDATION

FLIGHT TRAINING Suggested flight time: 1.0 hour dual (0.2 IF)		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved*
(c)	identify and avoid terrain and traffic	1	
(d)	for the following straight and level manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) at slow speed	1	
	(ii) at normal cruise	1	
	(iii) at high-speed cruise	1	
	(iv) during acceleration and deceleration	1	
	(vii) with flaps selected	1	
A3.4	**Turn aeroplane**		
(a)	operate and monitor all aircraft systems during turning flight manoeuvres	1	
(b)	for the following turning manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) level turns	1	
	(ii) climbing turns	1	
	(iii) powered descending turns	1	
	(iv) gliding descending turns	1	
(c)	complete turn manoeuvre on a nominated heading or geographical feature	1	
(d)	turn aeroplane at varying rates to achieve specified tracks	1	
(e)	manoeuvre aeroplane over specified tracks or geographical features	1	
C3.1	**Operate radio equipment**	1	
C3.3	**Operate transponder**	1	
A3.7	**Local area airspace**		
(a)	using an appropriate chart, for the local area and circuit area:		
	(i) identify geographical features	1	
	(ii) identify geographical limits	1	
	(iii) identify restricted, controlled and uncontrolled airspace areas	1	
	(iv) state local airspace limits	1	
	(v) identify the transit route between the departure aerodrome and training area	1	
	(vi) identify the geographical limits of the training area	1	
	(vii) identify aerodromes and landing areas within the local area	1	
(b)	maintain orientation and pinpoint location by using geographical features and a local area chart	1	
(c)	transit from the circuit area and transit to the designated training area	1	
(d)	operate safely within a transit lane (if applicable)	1	
(e)	remain clear of restricted, controlled and other appropriately designated airspace	1	
(f)	operate safely in the vicinity of local aerodromes and landing areas	1	
(g)	transit from the designated training area to the circuit area	1	
(h)	set QNH appropriately	1	
(i)	correctly determine which runway is to be used for landing	1	
(j)	ensure runway is serviceable and available	1	

PLAN AND TRAINING RECORD
RPL(A) 27: CONSOLIDATION

FLIGHT TRAINING **Suggested flight time: 1.0 hour dual (0.2 IF)**			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	**Achieved***
(k)	position aircraft for arrival into the circuit	**1**	
A6.3	**Perform forced landing (simulated)**	2	
A6.4	**Conduct precautionary search and landing (simulated condition)**	2	
A6.5	**Manage other abnormal situations (simulated**		
(d)	identify and conduct flight with an unreliable airspeed indication	3	
IFF.1	**Determine and monitor the serviceability of flight instruments and instrument power sources**	3	
IFF.2	**Perform manoeuvres using full instrument panel**	3	
IFF.3	**Recover from upset situations and unusual attitudes**	3	
A3.3	**Descend aeroplane**		
(a)	operate and monitor all aircraft systems during descending flight manoeuvres	**1**	
(b)	for the following descending manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) glide	**1**	
	(ii) powered	**1**	
	(iii) approach configuration descent (flap and undercarriage)	**1**	
(c)	anticipate level-off altitude and achieve straight and level flight	**1**	
A4.5	**Short landing**	2	
C2.3	**Post-flight actions and procedures**	**1**	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	**Achieved**

PLAN AND TRAINING RECORD
RPL(A) 27: CONSOLIDATION

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 28: CONSOLIDATION

Flight no:	RPL(A)28.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- Consolidate and **assess:**
  - plan fuel requirements, refuelling, manage fuel system
  - simulated engine failure on take-off
  - radio failure procedures
  - local area airspace
  - take-offs, circuits, landings (including missed approach and missed landing)
  - simulated engine failure in circuit area
  - precautionary search and landing
  - climbing, turning, descending
  - forced landing – simulated complete and partial engine failures
  - slow flight, stalling, incipient spin
  - steep turns, sideslipping
  - unusual flight attitude recoveries
  - basic instrument flight
  - manage and assist passengers, manage cargo
  - non-technical skills
- Flight manoeuvres to be performed within the flight tolerances mentioned in Table 1, Schedule 8 of the Part 61 MOS

PRE-FLIGHT KNOWLEDGE
Long Briefing: as required Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Long briefing
- Revision as required

Underpinning knowledge
- Review/expand previously introduced knowledge as required

HF & NTS
- Review as required

Pre-flight briefing
- Review flight sequences, what to expect, see & do
- Check essential knowledge
- Reinforce threat & error management
- Reinforce significant airmanship points

LESSON PLAN AND TRAINING RECORD
RPL(A) 28: CONSOLIDATION

PRE-FLIGHT KNOWLEDGE Long Briefing: as required Pre-flight Briefing: 0.3 hour Underpinning knowledge: as required	
Content	
Theory examination • RPLA aeronautical knowledge examination (in-house) (in accordance with the knowledge standards specified in the Part 61 MOS) • Knowledge deficiency report (required when the knowledge examination pass is less than 100%)	
Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.4 hours dual (0.2 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
C4.1	**Plan fuel requirements**	1	
C4.3	**Refuel aircraft**	1	
C4.2	**Manage fuel system**	1	
C5.1	**Manage passengers**		
(a)	supervise passenger safety	1	
(b)	encourage passengers to participate in and contribute to the safe outcome of the flight	1	
(c)	conduct pre-flight passenger safety briefing	1	
(d)	ensure passengers are aware of, and avoid interference with, flight and systems controls	1	
(e)	ensure passengers are aware of, and comply with, the use of seat harnesses	1	
(f)	ensure passengers are aware of the use of escape hatches, exits and emergency equipment on board the aircraft	1	
(g)	manage passenger safety in the event of abnormal or in-flight emergency situations	1	
C5.2	**Aid and assist passengers**		
(a)	establish and maintain clear communications with passengers	1	
(b)	assist with passenger comfort both when airside and in flight	1	
C5.3	**Manage cargo**		
(a)	manage loading, unloading and security of cargo during flight operations	1	
(b)	identify dangerous goods and apply procedures to ensure safety and security	1	

LESSON PLAN AND TRAINING RECORD
RPL(A) 28: CONSOLIDATION

FLIGHT TRAINING Suggested flight time: 1.4 hours dual (0.2 IF)			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
A2.2	**Take off aeroplane**		
(a)	apply the controls correctly to maintain longitudinal alignment on the centreline of the runway, if appropriate, prior to initiating and during the take-off	1	
(b)	adjust the power controls taking into account the existing conditions	1	
(c)	monitor power controls, settings, and instruments during take-off to ensure all predetermined parameters are achieved and maintained	1	
(d)	adjust the controls to attain the desired pitch attitude at the predetermined airspeed to attain the desired performance	1	
(e)	perform the take-off applying the required pitch, roll and yaw inputs as appropriate in a smooth, coordinated manner	1	
(f)	trim the aeroplane accurately	1	
(g)	perform gear and flap retractions, power adjustments (as applicable) and other required pilot-related activities	1	
(h)	maintain flight path along the runway extended centreline	1	
(i)	apply the applicable noise abatement and wake turbulence avoidance procedures	1	
(j)	recognise take-off abnormalities and take appropriate action to reject take-off (can be simulated)	1	
A2.3	**Take off aeroplane in a crosswind**		
(a)	perform a take-off in an aeroplane making appropriate adjustments for the crosswind conditions	1	
(b)	maintain the runway centreline and extended centreline	1	
A2.5	**Take off aeroplane from 'short field'**		
(a)	calculate take-off and landing performance in accordance with the aeroplane's performance charts	1	
(b)	perform take-off aeroplane to achieve the minimum length take-off performance	1	
(c)	perform take-off aeroplane to achieve the obstacle clearance parameters	1	
A6.1	**Manage engine failure - take-off (simulated)**	1	
A2.4	**Carry out after take-off procedures**		
(a)	perform after take-off checklist	1	
(b)	maintain the appropriate climb segment at the nominated heading and airspeed	1	
(c)	manoeuvre according to local and standard procedures	1	
(d)	maintain traffic separation	1	
A3.1	**Climb aeroplane**	1	
A3.2	**Maintain straight and level flight**	1	
A3.4	**Turn aeroplane**	1	
A3.7	**Local area airspace**	1	
A3.5	**Control aeroplane at slow speeds**		
(a)	complete pre-manoeuvre checks	1	
(b)	operate and monitor all aircraft systems when operating the aeroplane at slow speed	1	
(c)	for the following climbing manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) minimum approach speed with flaps retracted	1	
	(ii) minimum approach speed in approach configuration	1	
(d)	observe audible and visual stall warnings and recover aeroplane to controlled flight	1	
(e)	recognise and respond positively to reduced effectiveness of controls during slow flight manoeuvres	1	

LESSON PLAN AND TRAINING RECORD
RPL(A) 28: CONSOLIDATION

FLIGHT TRAINING
Suggested flight time: 1.4 hours dual (0.2 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
(f)	transition from slow speed configuration using take-off power to achieve nominated speed in excess of 1.5 Vs without loss of height	1	
A5.1	**Enter and recover from stall**		
(a)	perform pre-manoeuvre checks for stalling	1	
(b)	recognise stall signs and symptoms	1	
(c)	control the aeroplane by applying the required pitch, roll and yaw inputs as appropriate in a smooth, coordinated manner, trim aeroplane accurately to enter and recover from the following manoeuvres:		
	(i) incipient stall	1	
	(ii) stall with full power applied	1	
	(iii) stall without power applied	1	
	(iv) stall under the following conditions:	1	
	(A) straight and level flight	1	
	(B) climbing	1	
	(C) descending	1	
	(D) approach to land configuration	1	
	(E) turning	1	
(d)	perform stall recovery as follows:		
	(i) positively reduce angle of attack	1	
	(ii) use power available and excess height to increase the aircraft energy state	1	
	(iii) minimise height loss for simulated low altitude condition	1	
	(iv) re-establish desired flight path and aircraft control	1	
(e)	recover from stall in simulated partial and complete engine failure configurations	1	
A5.2	**Recover from incipient spin**		
(a)	perform pre-manoeuvre checks for an incipient spin	1	
(b)	recognise an incipient spin	1	
(c)	use the aeroplane's attitude and power controls to execute an incipient spin manoeuvre from the following flight conditions and, using correct recovery technique, regain straight and level flight with height loss commensurate with the available altitude (simulated ground base height may be set):		
	(i) straight and level flight	1	
	(ii) climbing	1	
	(iii) turning	1	
A5.3	**Turn aeroplane steeply**		
(a)	pre-manoeuvre checks for steep turning	1	
(b)	steep level turn using a nominated bank angle, ending on a nominated heading or geographical feature, without altitude change	1	
(c)	steep descending turn using a nominated bank angle, ending on a nominated heading or geographical feature ending on a nominated altitude	1	
(d)	aeroplane operating limits are not exceeded	1	
A5.4	**Sideslip aeroplane (where flight manual permits)**		
(a)	straight sideslip:		
	(i) induce slip to achieve increased rate of descent while maintaining track and airspeed	1	
	(ii) adjust rate of descent by coordinating angle of bank and applied rudder	1	

LESSON PLAN AND TRAINING RECORD
RPL(A) 28: CONSOLIDATION

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
FLIGHT TRAINING Suggested flight time: 1.4 hours dual (0.2 IF)			
(b)	sideslipping turn by adjusting the bank angle to turn through minimum heading change of 90° at constant airspeed using sideslip, and exiting the turn on a specified heading or geographical feature, within tolerance	1	
(c)	recover from a sideslip and return the aeroplane to balanced flight	1	
A6.6	**Recover from unusual flight attitudes**		
(a)	identify nose-high or nose-low unusual attitude flight condition	1	
(b)	recover from nose-low or nose-high unusual attitudes by adjusting pitch, bank and power to resume controlled and balanced flight	1	
(c)	apply controlled corrective action while maintaining aircraft performance within limits	1	
A6.3	**Perform forced landing (simulated)**		
(a)	after a simulated complete engine failure has occurred, without prior indications, carry out the following:		
	(i) identify complete power failure condition and control aeroplane	1	
	(ii) perform immediate actions	1	
	(iii) formulate and describe a recovery plan, including selecting the most suitable landing area	1	
	(iv) establish optimal gliding flight path to position the aeroplane for a landing on the selected landing area	1	
	(v) perform emergency procedures and land the aeroplane if the engine cannot be restarted as time permits	1	
	(vi) advise ATS or other agencies capable of providing assistance of situation and intentions	1	
	(vii) re-brief passengers about flight situation, brace position and harness security	1	
	(viii) land the aeroplane ensuring safest outcome if an engine restart is not achieved	1	
(b)	after a simulated partial engine failure has occurred, without prior indications, carry out the following:		
	(i) identify partial power failure condition	1	
	(ii) perform recall actions	1	
	(iii) adjust flight controls to re-establish flight path that maximises performance for partial power condition and maintain a safe airspeed margin above stall speed	1	
	(iv) establish radio communications where possible	1	
	(v) perform partial engine failure actions	1	
	(vi) formulate a plan to recover aeroplane to a safe landing area or aerodrome, taking into account that partial failure might lead to a full power failure at any time	1	
	(vii) manoeuvre the aeroplane to a selected landing area or aerodrome using the remaining power to establish an optimal aircraft position for a safe landing	1	
	(viii) advise ATS or other agencies capable of providing assistance of situation and intentions	1	
	(ix) re-brief passengers about flight situation, brace position and harness security	1	
	(x) maintain a contingency plan for coping with a full power failure throughout the manoeuvre	1	
	(xi) when a safe landing position is established, shut down and secure engine and aeroplane	1	
A6.4	**Conduct precautionary search and landing (simulated condition)**		
(a)	assess flight circumstances and make an appropriate decision when to perform precautionary landing	1	
(b)	configure aeroplane for conditions	1	
(c)	perform precautionary search procedure	1	
(d)	select landing area, carry out an inspection and assess its suitability for landing, taking into account:		
	(i) unobstructed approach and overshoot paths	1	
	(ii) landing area length adequate for landing	1	
	(iii) landing area surface is suitable for aeroplane type and clear of hazards	1	
(e)	maintain orientation and visual contact with the landing area	1	

LESSON PLAN AND TRAINING RECORD
RPL(A) 28: CONSOLIDATION

FLIGHT TRAINING Suggested flight time: 1.4 hours dual (0.2 IF)			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
(f)	advise ATS or other agencies capable of providing assistance of situation and intentions	1	
(g)	re-brief passengers about flight situation, brace position and harness security	1	
(h)	land and secure aircraft and manage passengers	1	
IFF.1	**Determine and monitor the serviceability of flight instruments and instrument power sources**		
(a)	determine serviceability of flight and navigational instruments	1	
(b)	perform functional checks of flight and navigational instruments where applicable prior to take-off	1	
(c)	monitor flight instrument and instrument power sources and react to any warnings, unserviceability or erroneous indications	1	
IFF.2	**Perform manoeuvres using full instrument panel**		
(a)	interpret flight instrument indications and apply procedures and techniques to achieve and maintain a specified flight path using the aircraft's full instrument panel	1	
(c)	set and maintain power and attitude by reference to the full instrument panel to establish a rate 1 turn onto a nominated heading within the flight tolerances	1	
IFF.3	**Recover from upset situations and unusual attitudes**		
(a)	correctly identify upset situations and unusual attitudes under simulated IMC	1	
(b)	recover to controlled flight from upset situations and unusual attitudes under simulated IMC from any combination of the following aircraft states:		
	(i) high and low-nose attitudes	1	
	(ii) varying angles of bank	1	
	(iii) various power settings	1	
	(iv) various aircraft configurations	1	
	(v) unbalanced flight	1	
C3.2	**Manage R/T equipment malfunctions**		
(a)	perform radio failure procedures	1	
(b)	use fault finding procedures and perform corrective actions	1	
A3.3	**Descend aeroplane**	1	
A3.6	**Perform circuits and approaches**		
(a)	operate and monitor all aircraft systems when operating the aeroplane in the circuit	1	
(b)	in accordance with specific local procedures, safely perform a full circuit pattern (5 legs) by balancing and trimming the aeroplane accurately while applying smooth, coordinated control inputs to achieve the required flight tolerances specified for the flight path flown during traffic pattern manoeuvres as follows:		
	(i) track upwind along extended centreline to 500 ft	1	
	(ii) establish and maintain crosswind leg tracking 90° to the runway	1	
	(iii) establish and maintain downwind leg tracking parallel to, and at a specified distance from, the runway at circuit height	1	
	(iv) establish base leg tracking 90° to the runway at a specified distance from the runway threshold	1	
(c)	perform checks as required throughout circuit	1	
(d)	establish the approach and landing configuration appropriate for the runway and meteorological conditions, and adjust the power plant controls as required for the following:		
	(i) commence and control approach descent path	1	
	(ii) adjust descent commencement point to take account of extended downwind leg or traffic adjustments	1	
	(iii) align and maintain aircraft on final approach flight path with specified or appropriate runway	1	
	(iv) set and maintain approach configuration not below 500 ft AGL	1	
	(v) identify and maintain the nominated aiming point	1	

LESSON PLAN AND TRAINING RECORD
RPL(A) 28: CONSOLIDATION

FLIGHT TRAINING **Suggested flight time: 1.4 hours dual (0.2 IF)**			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	**Achieved***
	(vi) maintain a stabilised approach angle at the nominated airspeed not less than 1.3Vs to the round-out height	1	
	(vii) verify existing wind conditions, make proper correction for drift, and maintain a precise ground track	1	
	(viii) apply speed allowances for wind gusts	1	
	(ix) configure aeroplane for landing	1	
(e)	maintain aircraft separation and position in the circuit with reference to other aircraft traffic in the circuit area	1	
A6.2	**Manage engine failure in the circuit area (simulated)**		
(a)	correctly identify an engine failure during flight	1	
(b)	apply the highest priority to taking action to control the aeroplane	1	
(c)	perform recall actions	1	
(d)	select a suitable landing area within gliding distance, on the aerodrome or elsewhere	1	
(e)	perform emergency procedures and land the aeroplane if the engine cannot be restarted as time permits	1	
(f)	advise ATS or other agencies capable of providing assistance of situation and intentions	1	
(g)	re-brief passengers about flight situation, brace position and harness security	1	
(h)	land the aeroplane ensuring safest outcome if an engine restart is not achieved	1	
A6.5	**Manage other abnormal situations (simulated)**		
(a)	correctly identify the situation and maintain safe control of the aeroplane at all times	1	
(b)	manage abnormal and emergency situations in accordance with relevant emergency procedures and regulatory requirements	1	
(c)	follow appropriate emergency procedures while maintaining control of the aeroplane	1	
(d)	identify and conduct flight with an unreliable airspeed indication	1	
(e)	correctly identify when an emergency evacuation of an aeroplane is required	1	
(f)	execute a simulated emergency evacuation of an aeroplane	1	
(g)	advise ATS or other agencies capable of providing assistance of situation and intentions	1	
NTS1.2	**Maintain situational awareness**		
(a)	monitor all aircraft systems using a systematic scan technique	1	
(b)	collect information to facilitate ongoing system management	1	
(c)	monitor flight environment for deviations from planned operations	1	
(d)	collect flight environment information to update planned operations	1	
NTS1.3	**Assess situations and make decisions**		
(a)	identify problems	1	
(b)	analyse problems	1	
(c)	identify solutions	1	
(d)	assess solutions and risks	1	
(e)	decide on a course of action	1	
(f)	communicate plans of action (if appropriate)	1	
(g)	allocate tasks for action (if appropriate)	1	
(h)	take actions to achieve optimum outcomes for the operation	1	
(i)	monitor progress against plan	1	
(j)	re-evaluate plan to achieve optimum outcomes	1	

LESSON PLAN AND TRAINING RECORD
RPL(A) 28: CONSOLIDATION

FLIGHT TRAINING
Suggested flight time: 1.4 hours dual (0.2 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
NTS1.4	**Set priorities and manage tasks**		
(a)	organise workload and priorities to ensure optimum outcome of the flight	1	
(b)	plan events and tasks to occur sequentially	1	
(c)	anticipate events and tasks to ensure sufficient opportunity for completion	1	
(d)	use technology to reduce workload and improve cognitive and manipulative activities	1	
NTS1.5	**Maintain effective communications and interpersonal relationships**		
(a)	establish and maintain effective and efficient communications and interpersonal relationships with all stakeholders to ensure the optimum outcome of the flight	1	
(b)	define and explain objectives to stakeholders	1	
(c)	demonstrate a level of assertiveness that ensures the optimum completion of the flight	1	
NTS2.1	**Recognise and manage threats**		
(a)	identify relevant environmental or operational threats that are likely to affect the safety of the flight	1	
(b)	identify when competing priorities and demands may represent a threat to the safety of the flight	1	
(c)	develop and implement countermeasures to manage threats	1	
(d)	monitor and assess flight progress to ensure a safe outcome, or modify actions when a safe outcome is not assured	1	
NTS2.2	**Recognise and manage errors**		
(a)	apply checklists and standard operating procedures to prevent aircraft handling, procedural or communication errors	1	
(b)	identify committed errors before safety is affected or the aircraft enters an undesired state	1	
(c)	monitor the following to collect and analyse information to identify potential or actual errors:		
	(i) aircraft systems using a systematic scan technique	1	
	(ii) the flight environment	1	
	(iii) other crew	1	
(d)	implement countermeasures to prevent errors or take action in the time available to correct errors before the aircraft enters an undesired state	1	
NTS2.3	**Recognise and manage undesired aircraft state**		
(a)	recognise an undesired aircraft state	1	
(b)	prioritise tasks to ensure an undesired aircraft state is managed effectively	1	
(c)	apply corrective actions to recover an undesired aircraft state in a safe and timely manner	1	
A4.1	**Land aeroplane**		
(a)	maintain a constant landing position aim point	1	
(b)	achieve a smooth, positively-controlled transition from final approach to touchdown, including the following:		
	(i) control ballooning during flare	1	
	(ii) touchdown at a controlled rate of descent, in the specified touchdown zone within tolerances	1	
	(iii) control bouncing after touchdown	1	
	(iv) touch down aligned with the centreline within tolerances	1	
(c)	ensure separation is maintained	1	
(d)	maintain positive directional control and crosswind correction during the after-landing roll	1	
(e)	use drag and braking devices, as applicable, in such a manner to bring the aeroplane to a safe stop	1	
(f)	complete the applicable after-landing checklist items in a timely manner	1	
A4.2	**Land aeroplane in a crosswind**		
(a)	verify existing wind conditions, make proper correction for drift, and maintain a precise ground track	1	

LESSON PLAN AND TRAINING RECORD
RPL(A) 28: CONSOLIDATION

FLIGHT TRAINING Suggested flight time: 1.4 hours dual (0.2 IF)		Performance Standard	
MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Required	Achieved*
(b)	configure the aeroplane for the crosswind conditions	1	
(c)	control the aeroplane during the transition from final approach to touchdown and during after-landing roll to compensate for the crosswind conditions	1	
A4.3	**Conduct a missed approach**		
(a)	recognise the conditions when a missed approach should be executed	1	
(b)	make the decision to execute a missed approach when it is safe to do so	1	
(c)	make a smooth, positively-controlled transition from approach to missed approach, including the following:		
	(i) select power, attitude and configuration to safely control aeroplane	1	
	(ii) manoeuvre aeroplane clear of the ground and conduct after take-off procedures	1	
	(iii) make allowance for wind velocity during go-around	1	
	(iv) avoid wake turbulence	1	
A4.4	**Perform recovery from missed landing**		
(a)	recognise when a missed landing is occurring and when it is appropriate to take recovery action	1	
(b)	make the decision to execute recovery from a missed landing only when it is safe to do so	1	
(c)	make a smooth, positively-controlled transition from a missed landing to missed approach, including the following:		
	(i) select power, attitude and configuration to safely control aeroplane	1	
	(ii) manoeuvre aeroplane clear of the ground and conduct after take-off procedures	1	
	(iii) make allowance for wind velocity during go-around	1	
	(iv) avoid wake turbulence	1	
A4.5	**Short landing**		
(a)	land aeroplane at nominated touchdown point at minimum speed	1	
(b)	control ballooning during flare	1	
(c)	control bouncing after touchdown	1	
(d)	maintain direction after touchdown	1	
(e)	apply maximum braking without locking up wheels	1	
(f)	stops aircraft within landing distance available	1	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

LESSON PLAN AND TRAINING RECORD
RPL(A) 28: CONSOLIDATION

CONSOLIDATION AND/OR REMEDIAL TRAINING			
		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Required**	**Achieved**

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 29: SOLO CONSOLIDATION

Flight no:	RPL(A)29.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- 'Short field' take-off and landing
- Practice forced landing
- Basic stalls
- Steep level turns
- **Suggested flight time: 1.0 hour**

Operational Limitations:

During solo flight, trainees must only be authorised to practise sequences that have been assessed to performance standard 2 or 1, on a minimum of two separate flights.

Except in emergency or urgency situations, or in the interests of maintaining safety, the trainee must not operate contrary to the limitations and guidelines specified by the authorising flight instructor.

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

Recreational Pilot Licence – Aeroplane Category Rating and Flight Radio Endorsement

LESSON PLAN AND TRAINING RECORD
RPL(A) 30: PRE-LICENCE

Flight no:	RPL(A)30.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- Consolidate and **assess:**
  - radio failure procedures
  - take-offs, circuits, landings (including missed approach and missed landing)
  - simulated engine failure in circuit area
  - precautionary search and landing
  - forced landing – simulated complete and partial engine failures
  - slow flight, stalling, incipient spins
  - steep turns, sideslipping
  - unusual flight attitude recoveries
  - basic instrument flight
  - manage and assist passengers, manage cargo
  - non-technical skills
- Flight manoeuvres to be performed within the flight tolerances mentioned in Table 1, Schedule 8 of the Part 61 MOS

PRE-FLIGHT KNOWLEDGE **Long Briefing: as required Pre-flight Briefing: as required** **Underpinning knowledge: as required**	
Content	
Long briefing • Revision as required	
Underpinning knowledge • Review and assess flight test knowledge requirements	
HF & NTS • Review as required	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

LESSON PLAN AND TRAINING RECORD
RPL(A) 30: PRE-LICENCE

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.4 hours dual (0.2 IF)

MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
C5.1	Manage passengers	1	
C5.2	Aid and assist passengers	1	
C5.3	Manage cargo	1	
A2.2	Take off aeroplane	1	
A2.3	Take off aeroplane in a crosswind	1	
A2.5	Take off aeroplane from ‘short field’	1	
A2.4	Carry out after take-off procedures	1	
A3.1	Climb aeroplane	1	
A3.2	Maintain straight and level flight	1	
A3.4	Turn aeroplane	1	
A3.5	Control aeroplane at slow speeds	1	
A5.1	Enter and recover from stall	1	
A5.2	Recover from incipient spin	1	
A5.3	Turn aeroplane steeply	1	
A5.4	Sideslip aeroplane (where flight manual permits)	1	
A6.6	Recover from unusual flight attitudes	1	
A6.3	Perform forced landing (simulated)	1	
A6.4	Conduct precautionary search and landing (simulated condition)	1	
A3.3	Descend aeroplane	1	
IFF.1	Determine and monitor the serviceability of flight instruments and instrument power sources	1	
IFF.2	Perform manoeuvres using full instrument panel	1	
IFF.3	Recover from upset situations and unusual attitudes	1	
C3.2	Manage R/T equipment malfunctions	1	
A3.6	Perform circuits and approaches	1	
A6.2	Manage engine failure in the circuit area (simulated)	1	
A6.5	Manage other abnormal situations (simulated)	1	
NTS1.2	Maintain situational awareness	1	
NTS1.3	Assess situations and make decisions	1	
NTS1.4	Set priorities and manage tasks	1	
NTS1.5	Maintain effective communications and interpersonal relationships	1	

LESSON PLAN AND TRAINING RECORD
RPL(A) 30: PRE-LICENCE

FLIGHT TRAINING **Suggested flight time: 1.4 hours dual (0.2 IF)**		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Required**	**Achieved***
NTS2.1	**Recognise and manage threats**	1	
NTS2.2	**Recognise and manage errors**	1	
NTS2.3	**Recognise and manage undesired aircraft state**	1	
A4.1	**Land aeroplane**	1	
A4.2	**Land aeroplane in a crosswind**	1	
A4.3	**Conduct a missed approach**	1	
A4.4	**Perform recovery from missed landing**	1	
A4.5	**Short landing**	1	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Required**	**Achieved**

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

LESSON PLAN AND TRAINING RECORD
RPL(A) 30: PRE-LICENCE

COMMENTS AND OUTCOME		
Proceed to RPL(A) flight test?#	**Yes**	**No**

#Each of the performance criteria contained within the units of competency for the Recreational Pilot Licence –Aeroplane Category Rating and Flight Radio Endorsement must have been assessed to performance standard 1, on a minimum of two separate flights.

Instructor's signature & date	**Trainee's signature & date**

ACCELERATED COMPETENCY

Flight no:		**Trainee name & ARN:**	
Date:		**Instructor:**	

FLIGHT TRAINING		
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard Achieved**

COMMENTS

Instructor's signature & date	Trainee's signature & date

This form is to be used to record the assessments which are made ahead of the syllabus schedule (i.e. not included in the lesson plan and training record form).

Enter the assessed performance criteria and the standard achieved. Attach the form to the lesson plan and training record form for the lesson in which the early assessment was made.

5.3 PPL SYLLABUS

Private Pilot Licence – Aeroplane Category Rating
(for RPL/GFPT holders)

FLIGHT TRAINING AND THEORY EXAMINATION SUMMARY

LESSON #	LESSON DESCRIPTION	DUAL	SOLO	PROG DUAL	PROG SOLO	IF	PROG IF	TOTAL PROG FLIGHT TIME
PPL(A)1	Navigation exercise #1	2.5		2.5				2.5
PPL(A)2	Navigation exercise #2	3.0		5.5		0.3	0.3	5.5
PPL(A)3	Navigation exercise #3	3.5		9.0		0.3	0.6	9.0
PPL(A)4	First solo navigation exercise		2.5		2.5			11.5
PPL(A)5	Navigation exercise #5	3.0		12.0		0.2	0.8	14.5
PPLA Aeronautical knowledge examination								
PPL(A)6	Navigation exercise #6	3.5		15.5		0.2	1.0	18.0
PPL(A)7	Solo navigation exercise		3.0		5.5			21.0
PPL Aeroplane Category Rating flight test		**2.8**		**18.3**	**5.5**	**0.2**	**1.2**	**23.8**

Private Pilot Licence – Aeroplane Category Rating

SYLLABUS INTRODUCTION

Overview

This syllabus describes the flight training and assessment activities to be undertaken during the private pilot licence – aeroplane category rating training course. The aim of the course is to provide the student with the required skills, knowledge and attitudes to safely exercise the privileges of the PPL (A).

Flight training lessons include navigation exercises incorporating operations at controlled aerodromes and in controlled airspace, basic and advanced manoeuvres, circuit operations, basic instrument flight and procedures in the event of abnormal situations. Human factors and non-technical skills awareness and application are also included.

The privileges and limitations of the private pilot licence – aeroplane category rating are defined in CASR Part 61 Subpart 61.H.

Competency Standards

Practical flight competency standards

Flight training is provided to allow the student to meet the prescribed Part 61 MOS practical flight competency standards. Student performance is assessed against these flight competency standards. The standards required for the completion of this course and the issue of the licence are captured by the following units of competency:

Unit code	Unit of competency
C1	Communicating in the aviation environment
C2	Perform pre- and post-flight actions and procedures
C3	Operate aeronautical radio
C4	Manage fuel
C5	Manage passengers and cargo
NTS1	Non-technical skills 1
NTS2	Non-technical skills 2
NAV	Navigate aircraft
A1	Control aeroplane on the ground
A2	Take-off aeroplane
A3	Control aeroplane in normal flight
A4	Land aeroplane
A5	Aeroplane advanced manoeuvres
A6	Manage abnormal situations – single-engine aeroplanes
IFF	Instrument flight full panel
ONTA	Operate at non-towered aerodrome
OGA	Operate in Class G airspace
CTR	Operate at a controlled aerodrome
CTA	Operate in controlled airspace

Private Pilot Licence – Aeroplane Category Rating

SYLLABUS INTRODUCTION

Competency Standards

Aeronautical knowledge standards

The knowledge required to meet the aeronautical knowledge standards prescribed by the Part 61 MOS may be attained through student self-study or more formal training. Theory topics and content are described in the following units of knowledge:

Unit code	Unit of knowledge
PAKC	PPL Aeronautical knowledge
PFRC	PPL Flight rules and air law
PNVC	PPL Navigation
PMTC	PPL Meteorology
POPC	PPL Ops, performance and planning
PAKA	PPL Aeronautical knowledge - aeroplane
PFRA	PPL Flight rules and air law - aeroplane
POPA	PPL Ops, performance and planning - aeroplane

(Students will previously have met the requirements of units BAKC, RFRC, RMTC, PHFC, and RBKA and passed the RPLA aeronautical knowledge examination.)

Course prerequisites

This course has been developed for students already holding a recreational pilot licence and aeroplane category rating. Students should also have completed at least 1 hour of dual instrument time.

Students must be at least 17 years old to apply for a private pilot licence.

Course duration

The course may be undertaken on a part-time or full-time basis.

The syllabus is based on a total flight time of 23.8 hours inclusive of the PPL aeroplane category flight test; however the total flight time required to achieve competency will vary from student to student.

Course resources

Flight training is usually undertaken in the C152 or C150; however the C172RG may also be used.

Other resources include a model aeroplane, cockpit cut-out, instrument flight hood or foggles, navigation charts and navigation equipment.

Syllabus documentation

Syllabus documentation includes:

- a planning matrix
- a flight training and theory examination summary
- a lesson plan and training record for each flight

Refer to Part 5A/Section 5.1* of the operations manual for a guide to the use of the syllabus documents.

Private Pilot Licence – Aeroplane Category Rating

SYLLABUS INTRODUCTION

Lesson sequence and allowable variations
The flight training and theory examination summary provides the sequence of flight training lessons. Any variations to the lesson sequence are only to be made with the prior approval of the HOO or authorising instructor.
Solo flight
The course includes a minimum of 5 hours of solo cross country flight time. Prior to authorising a student to conduct a solo navigation exercise, instructors must ensure the requirements of section 3B1.1/3.4.1.1* are met. The student's flight plan and fuel calculations must be reviewed for accuracy.
Aeronautical knowledge examination
Successful completion of the following examination is required during the course: **Prior to flight test recommendation** - PPLA aeronautical knowledge examination The pass mark for the examination is 70%. The flight training and theory examination summary sets out the recommended sequence for aeronautical knowledge examination and navigation exercises. To avoid training delays, instructors should ensure students complete the examination in this sequence. Aeronautical knowledge examinations are conducted in the ground examination facility. Refer to Part 3E/Section 3.7* for further information regarding the conduct of these exams. **Knowledge Deficiency Report** If a student passes the PPLA aeronautical knowledge examination with a score of less than 100%, a report shall be prepared about the competency standards in which the student's knowledge is deficient (a knowledge deficiency report). Following further self-study, an instructor holding a grade 1 or 2 training endorsement must orally assess the student's knowledge to ensure the deficiencies noted on the knowledge deficiency report have been addressed (i.e. knowledge corrected to 100%). A copy of the knowledge deficiency report for the PPLA aeronautical knowledge examination must be provided to the flight examiner who is to conduct the flight test.

Private Pilot Licence – Aeroplane Category Rating

SYLLABUS INTRODUCTION

Flight test

Upon successful completion of the course students must pass the PPL aeroplane category flight test, prior to making application for the private pilot licence.

The test is conducted by a flight examiner and involves a ground component and a cross-country flight of approximately 2.8 hours (2.5 hours airborne time). An assessment of general handling competencies is included in the test.

Flight test standards are contained in Schedule 5 App H.1 to the Part 61 MOS. Manoeuvres must be performed within the flight tolerances specified in table 1, Section 1 of Schedule 8 of the MOS.

For flight test procedures and information regarding the booking of flight tests, refer to section 3F1/3.8.1*.

Document control and access information

This syllabus is a managed document and is uncontrolled if printed. Refer to the version number and date in the footer to ensure that the current syllabus is being referenced.

It is available in electronic format. Paper copies are also provided for use by instructors and students.

Syllabus documentation is to be read in conjunction with Advanced Aviation Training's operations manual, CASR Parts 61, 141 and the Part 61 Manual of Standards.

*MAAT manual reference

Planning Matrix **Private Pilot Licence - Aeroplanes (for RPL/GFPT holders) v1.1**

Performance Standards

3 = Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue
2 = Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision *
1 = Achieves competency to the standard required for qualification issue.

Solo operations for authorised sequences only

		1	2	3	4	5	6	7	8	
		Navigation exercise #1	Navigation exercise #2	Navigation exercise #3	Navigation exercise #4 - Solo	Navigation exercise #5	Navigation exercise #6	Navigation exercise #7– Solo	Flight Test	**Total hours**
	Dual day	2.5	3.0	3.5		3.0	3.5		2.8	18.3
	Solo day				2.5			3.0		5.5
	Instrument flight time		0.3	0.3		0.2	0.2		0.2	(1.2 IF)
	Aeronautical knowledge examinations	PPLA								**23.8**
Units, Elements and Performance Criteria										
NAV	**Navigate aircraft**									
NAV.1	**Prepare documents and flight plan**									
(a)	select and prepare appropriate navigation charts for the intended flight	3	2	2		1	1			
(b)	select a suitable route and altitude considering weather, terrain, airspace, NOTAMs and alternate landing areas	3	2	2		1	1			
(c)	obtain and interpret meteorological forecasts, NOTAMs and operational information applicable to the planned flight	3	2	2		1	1			
(d)	determine whether the planned flight can be conducted under the applicable flight rules and taking account of the beginning and end of daylight times	3	2	2		1	1			
(f)	complete a flight plan to the planned destination and alternates	3	2	2		1	1			
(g)	lodge suitable flight notification for search and rescue (SAR) purposes	3	2	2		1	1			
NAV.2	**Comply with airspace procedures while navigating**									
(a)	identify airspace restrictions and dimensions applicable to the flight	3	2	2		1	1			
(b)	obtain and comply with air traffic clearances, if applicable	3	2	2		1	1			
(c)	comply with airspace procedures applicable to the airspace classification throughout the flight	3	2	2		1	1			
NAV.3	**Conduct departure procedures**									
(a)	organise cockpit to ensure charts, documentation and navigational calculator are accessible from the control seat	3	2	2		1	1			
(b)	comply with all departure procedures, clearances and noise abatement requirements	3	2	2		1	1			
(c)	establish planned track on departure within 5 nm of airfield or apply alternative procedure if required	3	2	2		1	1			
(d)	calculate estimated time of arrival (ETA) for first waypoint	3	2	2		1	1			
NAV.4	**Navigate aircraft enroute**									
(a)	maintain a navigation cycle that ensures accurate tracking, and apply track correctional techniques to re-establish track prior to waypoint or destination	3	2	2		1	1			
(b)	maintain heading to achieve a nominated track	3	2	2		1	1			
(c)	maintain and revise ETAs (±2 minutes) for waypoint or destination	3	2	2		1	1			
(d)	maintain track in accordance with published flight path tolerances in controlled airspace		2	2		1	1			
(e)	navigate using accepted map-reading techniques	3	2	2		1	1			
(f)	maintain navigation and fuel log to monitor tracking, ETAs and fuel status	3	2	2		1	1			
(g)	use appropriate techniques to obtain a positive fix at suitable intervals	3	2	2		1	1			
(h)	maintain awareness of route, enroute terrain, enroute and destination weather, and react appropriately to changing weather conditions	3	2	2		1	1			
(i)	perform pre-descent and turning point checks	3	2	2		1	1			
(j)	maintain appropriate radio communication and listening watch with ATS and other aircraft if radio is fitted and used	3	2	2		1	1			
(k)	configure the aircraft as required for the following environmental and operational conditions:									
	(i) turbulence		2	2		1	1			
	(ii) holding		2	2		1	1			
	(iii) maximum range		2	2		1	1			
(l)	maintain awareness of search and rescue times (SARTIME) and revise as required	3	2	2		1	1			
(m)	monitor aircraft systems, manage fuel and engine to ensure aircraft is operated to achieve flight plan objectives	3	2	2		1	1			
NAV.5	**Navigate at low level and in reduced visibility**									
(a)	configure the aircraft as required for the following environmental and operational conditions:									
	(i) reduced visibility		2	2		1	1			
	(ii) low cloud base		2	2		1	1			
(b)	navigate aeroplane at minimum heights (not below 500 ft AGL, clear of built-up areas) and remain in VMC		3	2		1	1			
(c)	maintain separation from terrain, obstacles, allowing for wind and turbulence at low level		3	2		1	1			
(d)	avoid noise sensitive areas		3	2		1	1			
(e)	operate appropriately in the vicinity of aerodromes and landing areas		3	2		1	1			
NAV.6	**Perform lost procedure**									
(a)	acknowledge positional uncertainty in a timely manner		2	2		1	1			
(b)	configure aircraft for range and endurance as required		2	2		1	1			
(c)	apply recognised method to re-establish aircraft position		2	2		1	1			
(d)	fix position		2	2		1	1			
(e)	use radio to request assistance, if applicable		2	2		1	1			
(f)	plan a timely precautionary search and landing if unable to complete flight safely to suitable aerodrome		2	2		1	1			
NAV.7	**Perform diversion procedure**									
(a)	make timely decision to divert		2	2		1	1			
(b)	identify an acceptable alternate aerodrome		2	2		1	1			
(c)	select a suitable route and cruising level		2	2		1	1			
(d)	revise flight plan considering weather, terrain, airspace and fuel available		2	2		1	1			
(e)	advise ATS of an intention to divert		2	2		1	1			
NAV.8	**Use instrument navigation systems**									
(a)	initialise navigation system (as applicable)	3	2	2		1	1			
(b)	conduct navigation system validity check (as applicable)	3	2	2		1	1			
(c)	conduct RAIM check if required	3	2	2		1	1			
(d)	select, load, check and activate the flight plan (as applicable)	3	2	2		1	1			
(e)	navigate on departure, enroute and on arrival using GNSS	3	2	2		1	1			
(f)	operate instrument navigation systems correctly	3	2	2		1	1			
(g)	use instrument navigation systems to assist with navigation	3	2	2		1	1			
(h)	confirm waypoints and fixes using instrument navigation systems	3	2	2		1	1			
NAV.9	**Execute arrival procedures**									
(a)	obtain updated relevant aerodrome information	3	2	2		1	1			

1

Planning Matrix **Private Pilot Licence - Aeroplanes (for RPL/GFPT holders) v1.1**

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**Solo operations for authorised sequences only*

		1 Navigation exercise #1	2 Navigation exercise #2	3 Navigation exercise #3	4 Navigation exercise #4 - Solo	5 Navigation exercise #5	6 Navigation exercise #6	7 Navigation exercise #7– Solo	8 Flight Test	Total hours
	Dual day	2.5	3.0	3.5		3.0	3.5		2.8	18.3
	Solo day				2.5			3.0		5.5
	Instrument flight time		0.3	0.3		0.2	0.2		0.2	(1.2 IF)
	Aeronautical knowledge examinations	PPLA								23.8
(b)	determine landing direction and aerodrome suitability	3	2	2		1	1			
(c)	conduct arrival	3	2	2		1	1			
(d)	identify and avoid all traffic	3	2	2		1	1			
(e)	observe local and published noise abatement requirements and curfews	3	2	2		1	1			
(f)	cancel SARWATCH	3	2	2		1	1			
ONTA	**Operate at non-towered aerodromes**									
ONTA.1	**Non-towered aerodrome – pre-flight preparation**									
(a)	using a current ERSA and NOTAM, for the non-towered aerodrome or landing area, extract all of the relevant operational information	3	2	2		1	1			
(b)	interpret the extracted information	3	2	2		1	1			
(c)	identify all special aerodrome procedures	3	2	2		1	1			
(d)	check current weather forecast and local observations	3	2	2		1	1			
(e)	identify all relevant radio and navigation aid frequencies	3	2	2		1	1			
ONTA.2	**Taxi aircraft at a non-towered aerodrome or landing area**									
(a)	refer to aerodrome or landing area chart (if available)	3	2	2		1	1			
(b)	set local QNH or area QNH	3	2	2		1	1			
(c)	broadcast intentions on appropriate frequency	3	2	2		1	1			
(d)	obtain and interpret traffic information	3	2	2		1	1			
(e)	maintain lookout for, and separation from, other aircraft, wildlife and other obstructions	3	2	2		1	1			
(f)	recognise ground markings during taxi and take appropriate action	3	2	2		1	1			
(h)	taxi aircraft to holding point	3	2	2		1	1			
(i)	use strobes when crossing any runway	3	2	2		1	1			
ONTA.3	**Perform departure at a non-towered aerodrome or landing area**									
(a)	check and ensure runway approach is clear prior to entering a runway	3	2	2		1	1			
(b)	correctly set transponder code and mode prior to entering runway for take-off	3	2	2		1	1			
(c)	confirm runway approaches clear in all directions prior to entering runway	3	2	2		1	1			
(d)	broadcast line up details	3	2	2		1	1			
(f)	transmit appropriate radio calls and maintain separation with other aircraft	3	2	2		1	1			
(g)	advise air service provider of departure details, if required	3	2	2		1	1			
(h)	conduct departure	3	2	2		1	1			
ONTA.4	**Perform arrival and landing at a non-towered aerodrome or landing area**									
(a)	check ERSA and NOTAM prior to entering circuit area	3	2	2		1	1			
(b)	set correct area or local QNH	3	2	2		1	1			
(c)	use correct radio frequency to transmit inbound calls as required	3	2	2		1	1			
(d)	maintain effective lookout	3	2	2		1	1			
(e)	maintain aircraft separation and avoid other traffic	3	2	2		1	1			
(f)	maintain tracking tolerances	3	2	2		1	1			
(g)	determine wind velocity	3	2	2		1	1			
(h)	determine landing direction	3	2	2		1	1			
(i)	confirm runway is serviceable for the operation	3	2	2		1	1			
(j)	determine circuit direction	3	2	2		1	1			
(k)	conduct landing area inspection (if applicable)	3	2	2		1	1			
(l)	position aircraft in the circuit in preparation for landing and maintain separation from traffic	3	2	2		1	1			
(m)	make all necessary circuit radio calls	3	2	2		1	1			
(n)	verify runway is clear of other traffic, wildlife and other obstructions	3	2	2		1	1			
(o)	land the aircraft	3	2	2		1	1			
(p)	vacate runway	3	2	2		1	1			
(q)	cancel SARWATCH, if applicable	3	2	2		1	1			
OGA	**Operate in Class G airspace**									
OGA	**Operate aircraft in Class G airspace**									
(a)	maintain tracking and altitude tolerances to remain outside controlled airspace	3	2	2		1	1			
(b)	apply separation tolerances between IFR flights, and IFR and VFR flights	3	2	2		1	1			
(c)	when using an aircraft radio:									
	(i) monitor appropriate radio frequency	3	2	2		1	1			
	(ii) make appropriate radio calls	3	2	2		1	1			
	(iii) obtain operational information from air services provider and other aircraft	3	2	2		1	1			
	(iv) use information to ensure aircraft separation is maintained	3	2	2		1	1			
	(v) apply loss of radio communication procedures		2	2		1	1			
(d)	using a suitable chart:									
	(i) operate clear of active aerodromes and landing areas in the vicinity of the aircraft	3	2	2		1	1			
	(ii) identify and remain clear of controlled and restricted airspace	3	2	2		1	1			
	(iii) take appropriate action when operating in the vicinity of a danger area	3	2	2		1	1			
(e)	perform actions in the event of abnormal operations and emergencies		2	2		1	1			
(f)	recall transponder emergency code and communication failure code		2	2		1	1			
CTR	**Operate at a controlled aerodrome**									
CTR.1	**Controlled aerodrome pre-flight preparation**									
(a)	using a current ERSA and NOTAM, for the controlled aerodrome, extract all the relevant operational information		2			1	1			
(b)	interpret the extracted information		2			1	1			
(c)	identify all special aerodrome procedures		2			1	1			
(d)	check current weather forecast and local observations		2			1	1			

2

Planning Matrix **Private Pilot Licence - Aeroplanes (for RPL/GFPT holders) v1.1**

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Solo operations for authorised sequences only

		1 Navigation exercise #1	2 Navigation exercise #2	3 Navigation exercise #3	4 Navigation exercise #4 - Solo	5 Navigation exercise #5	6 Navigation exercise #6	7 Navigation exercise #7– Solo	8 Flight Test	Total hours
	Dual day	2.5	3.0	3.5		3.0	3.5		2.8	18.3
	Solo day				2.5			3.0		5.5
	Instrument flight time		0.3	0.3		0.2	0.2		0.2	(1.2 IF)
	Aeronautical knowledge examinations	PPLA								23.8
(e)	identify all relevant radio and navigation aid frequencies		2			1	1			
CTR.2	**Taxi aircraft at a controlled aerodrome**									
(a)	obtain and comply with ATC clearances		3	2		1	1			
(b)	manoeuvre aircraft to holding point as instructed and take appropriate action to avoid other aircraft and obstructions		2			1	1			
(c)	recognise ground markings during taxi and take appropriate action		2			1	1			
(d)	recognise lighting signals and take appropriate action		2			1	1			
(e)	identify airport runway incursion hotspots		2			1	1			
(f)	manoeuvre aircraft to avoid jet blast hazard		2			1	1			
(g)	request taxi guidance if unsure of position		2			1	1			
(h)	use strobes when crossing any runway		2			1	1			
CTR.3	**Perform departure from controlled aerodrome**									
(a)	receive and correctly read back an airways clearance		2			1	1			
(b)	check and ensure runway approach is clear prior to entering a runway		1	1						
(c)	correctly set transponder code and mode prior to entering runway for take-off		2			1	1			
(d)	comply with ATC departure instructions		3	2		1	1			
(e)	advise ATC as soon as possible if unable to comply with clearance		3	2		1	1			
(f)	contact approach with airborne report or give departure call to tower		3	2		1	1			
(g)	maintain lookout		2			1	1			
(h)	avoid wake turbulence		3	2		1	1			
(i)	comply with airways clearances within tracking and altitude tolerances and maintain traffic lookout until clear of the aerodrome control zone		3	2		1	1			
CTR.4	**Perform arrival and landing at controlled aerodrome**									
(a)	check ERSA and NOTAM prior to entering control area and extract required operational information		2			1	1			
(b)	receive ATIS and correctly set the appropriate QNH		2			1	1			
(c)	request and receive ATC clearance and set correct transponder code prior to entering control area		2			1	1			
(d)	advise ATC as soon as possible if unable to comply with clearance		3	2		1	1			
(e)	maintain lookout at all times		2			1	1			
(f)	update QNH as required		2			1	1			
(g)	maintain tracking tolerances		3	2		1	1			
(h)	establish aircraft on the correct leg of the circuit in preparation for landing and maintain separation from traffic		2			1	1			
(i)	confirm clearance to land		2			1	1			
(j)	vacate runway and obtain taxi clearance		2			1	1			
CTA	**Operate in controlled airspace**									
CTA.1	**Operate aircraft in controlled airspace**									
(a)	comply with airways clearance requirements for operating in all classes of airspace, including lead time required for flight plan submission, contents, 'clearance void time', and 'readback' requirement		3	2		1	1			
(b)	apply airways clearance requirements for entering, operating in and departing from CTA and CTR, including details that need to be provided to ATC, and what details to expect from ATC		3	2		1	1			
(c)	maintain control area protection tolerances		3	2		1	1			
(d)	maintain tracking and altitude tolerances when operating on an airways clearance		3	2		1	1			
(e)	reconfirm any clearance items when doubt exists		3	2		1	1			
(f)	advise ATC as soon as possible if unable to maintain clearance due to adverse weather conditions		3	2		1	1			
(g)	follow ATC requirements for a change of level in CTA, including in an emergency situation		3	2		1	1			
(h)	comply with departure, climb, transition to cruise (levelling out), cruise, change of levels, descent and visual approach procedures in CTA and CTR instructions		3	2		1	1			
(i)	apply separation standards between IFR flights, and IFR and VFR flights in the various classes of CTA		3	2		1	1			
(j)	perform appropriate actions in the event of the loss of radio communication in CTA and CTR		3	2		1	1			
(k)	perform appropriate actions in the event of abnormal operations and emergency procedures in CTA and CTR		3	2		1	1			
(l)	operate under radar vectoring procedures, including radio procedures and phraseologies		3	2		1	1			
(m)	maximum permissible time interval between ATC transmissions during radar vectoring are not exceeded		3	2		1	1			
(n)	perform appropriate actions in the event of abnormal operations and emergencies		3	2		1	1			
(o)	recall transponder emergency code and communication failure code		2	2		1	1			
A3	**Control aeroplane in normal flight**									
A3.2	**Maintain straight and level flight** *(manoeuvres required for PPL and above)*									
(d)	for the following straight and level manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:									
	(v) at maximum range		2			1	1			
	(vi) at maximum endurance		2			1	1			
IFF	**Full instrument panel manoeuvres**									
IFF.2	**Perform manoeuvres using full instrument panel** *(manoeuvres required for PPL and above)*									
(b)	set and maintain power and attitude by reference to the full instrument panel to achieve the following:									
	(i) straight and level performance during normal cruise within the flight tolerances		2	1		1				
	(ii) nominated climb performance within the flight tolerances		2	1		1				
	(iii) descent performance within the flight tolerances		2	1		1				
NTS1	**Non-technical skills 1**									
NTS1.1	**Maintain effective lookout**									
(a)	maintain traffic separation using a systematic visual scan technique at a rate determined by traffic density, visibility and terrain		2	2		1	1			
(b)	maintain radio listening watch and interpret transmissions to determine traffic location and intentions		2	2		1	1			
(c)	perform airspace-cleared procedure before commencing any manoeuvre		2	2		1	1			

3

Planning Matrix **Private Pilot Licence - Aeroplanes (for RPL/GFPT holders) v1.1**

Performance Standards

3 = Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue
2 = Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision *
1 = Achieves competency to the standard required for qualification issue.

Solo operations for authorised sequences only

		1	2	3	4	5	6	7	8	
		Navigation exercise #1	Navigation exercise #2	Navigation exercise #3	Navigation exercise #4 - Solo	Navigation exercise #5	Navigation exercise #6	Navigation exercise #7– Solo	Flight Test	**Total hours**
	Dual day	2.5	3.0	3.5		3.0	3.5		2.8	18.3
	Solo day				2.5			3.0		5.5
	Instrument flight time		0.3	0.3		0.2	0.2		0.2	(1.2 IF)
	Aeronautical knowledge examinations	PPLA								**23.8**
NTS1.2	**Maintain situational awareness**									
(a)	monitor all aircraft systems using a systematic scan technique		2	2		1	1			
(b)	collect information to facilitate ongoing system management		2	2		1	1			
(c)	monitor flight environment for deviations from planned operations		2	2		1	1			
(d)	collect flight environment information to update planned operations		2	2		1	1			
NTS1.3	**Assess situations and make decisions**									
(a)	identify problems		2	2		1	1			
(b)	analyse problems		2	2		1	1			
(c)	identify solutions		2	2		1	1			
(d)	assess solutions and risks		2	2		1	1			
(e)	decide on a course of action		2	2		1	1			
(f)	communicate plans of action (if appropriate)		2	2		1	1			
(g)	allocate tasks for action (if appropriate)		2	2		1	1			
(h)	take actions to achieve optimum outcomes for the operation		2	2		1	1			
(i)	monitor progress against plan		2	2		1	1			
(j)	re-evaluate plan to achieve optimum outcomes		2	2		1	1			
NTS1.4	**Set priorities and manage tasks**									
(a)	organise workload and priorities to ensure optimum outcome of the flight		2	2		1	1			
(b)	plan events and tasks to occur sequentially		2	2		1	1			
(c)	anticipate events and tasks to ensure sufficient opportunity for completion		2	2		1	1			
(d)	use technology to reduce workload and improve cognitive and manipulative activities		2	2		1	1			
NTS1.5	**Maintain effective communications and interpersonal relationships**									
(a)	establish and maintain effective and efficient communications and interpersonal relationships with all stakeholders to ensure the optimum outcome of the flight		2	2		1	1			
(b)	define and explain objectives to stakeholders		2	2		1	1			
(c)	demonstrate a level of assertiveness that ensures the optimum completion of the flight		2	2		1	1			
NTS2	**Non-technical skills 2**									
NTS2.1	**Recognise and manage threats**									
(a)	identify relevant environmental or operational threats that are likely to affect the safety of the flight		2	2		1	1			
(b)	identify when competing priorities and demands may represent a threat to the safety of the flight		2	2		1	1			
(c)	develop and implement countermeasures to manage threats		2	2		1	1			
(d)	monitor and assess flight progress to ensure a safe outcome, or modify actions when a safe outcome is not assured		2	2		1	1			
NTS2.2	**Recognise and manage errors**									
(a)	apply checklists and standard operating procedures to prevent aircraft handling, procedural or communication errors		2	2		1	1			
(b)	identify committed errors before safety is affected or the aircraft enters an undesired state		2	2		1	1			
(c)	monitor the following to collect and analyse information to identify potential or actual errors:					1	1			
	(i) aircraft systems using a systematic scan technique		2	2		1	1			
	(ii) the flight environment		2	2		1	1			
	(iii) other crew		2	2		1	1			
(d)	implement countermeasures to prevent errors or take action in the time available to correct errors before the aircraft enters an undesired state		2	2		1	1			
NTS2.3	**Recognise and manage undesired aircraft state**									
(a)	recognise an undesired aircraft state		2	2		1	1			
(b)	prioritise tasks to ensure an undesired aircraft state is managed effectively		2	2		1	1			
(c)	apply corrective actions to recover an undesired aircraft state in a safe and timely manner		2	2		1	1			

4

Planning Matrix **Private Pilot Licence - Aeroplanes (for RPL/GFPT holders) v1.1**

Performance Standards

3 = Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue
2 = Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision *
1 = Achieves competency to the standard required for qualification issue.

Solo operations for authorised sequences only

		1	2	3	4	5	6	7	8	
		Navigation exercise #1	Navigation exercise #2	Navigation exercise #3	Navigation exercise #4 - Solo	Navigation exercise #5	Navigation exercise #6	Navigation exercise #7– Solo	Flight Test	**Total hours**
	Dual day	2.5	3.0	3.5		3.0	3.5		2.8	18.3
	Solo day				2.5			3.0		5.5
	Instrument flight time		0.3	0.3		0.2	0.2		0.2	(1.2 IF)
	Aeronautical knowledge examinations		PPLA							**23.8**
Verification of current competencies *(competencies attained during flight training for the RPL(A) and flight radio endorsement)*										
C1	**Communicating in the aviation environment**									
C1.1	**Communicating face-to-face**	1								
C1.2	**Operational communication using an aeronautical radio**					1				
C2	**Perform pre- and post-flight actions and procedures**									
C2.1	**Pre-flight actions and procedures**			1						
C2.2	**Perform pre-flight inspection**			1						
C2.3	**Post-flight actions and procedures**			1						
C3	**Operate aeronautical radio**									
C3.1	**Operate radio equipment**					1				
C3.2	**Manage R/T equipment malfunctions**			1						
C3.3	**Operate transponder**					1				
C4	**Manage fuel**									
C4.1	**Plan fuel requirements**			1						
C4.2	**Manage fuel system**					1				
C4.3	**Refuel aircraft**			1						
C5	**Manage passengers and cargo**									
C5.1	**Manage passengers**			1						
C5.2	**Aid and assist passengers**			1						
C5.3	**Manage cargo**			1						
A1	**Control aeroplane on the ground**									
A1.1	**Start and stop engine**			1						
A1.2	**Taxi aeroplane**			1						
A2	**Take-off aeroplane**									
A2.1	**Carry out pre take-off procedures**			1						
A2.2	**Take off aeroplane**			1						
A2.3	**Take off aeroplane in a crosswind**			1						
A2.4	**Carry out after take-off procedures**			1						
A2.5	**Take off aeroplane from 'short field'**			1						
A3	**Control aeroplane in normal flight**									
A3.1	**Climb aeroplane**			1						
A3.2	**Maintain straight and level flight**			1						
A3.3	**Descend aeroplane**			1						
A3.4	**Turn aeroplane**			1						
A3.5	**Control aeroplane at slow speeds**			1						
A3.6	**Perform circuits and approaches**			1						
A3.7	**Local area airspace**			1						
A4	**Land aeroplane**									
A4.1	**Land aeroplane**			1						
A4.2	**Land aeroplane in a crosswind**			1						
A4.3	**Conduct a missed approach**			1						
A4.4	**Perform recovery from missed landing**			1						
A4.5	**Short landing**			1						
A5	**Aeroplane advanced manoeuvres**									
A5.1	**Enter and recover from stall**					1				
A5.2	**Recover from incipient spin**					1				
A5.3	**Turn aeroplane steeply**					1				
A5.4	**Sideslip aeroplane** (where flight manual permits)					1				
A6	**Manage abnormal situations – single-engine aeroplanes**									
A6.1	**Manage engine failure - take-off** (simulated)					1				
A6.2	**Manage engine failure in the circuit area** (simulated)					1				
A6.3	**Perform forced landing** (simulated)					1				
A6.4	**Conduct precautionary search and landing** (simulated condition)					1				
A6.5	**Manage other abnormal situations** (simulated)					1				
A6.6	**Recover from unusual flight attitudes**					1				
IFF	**Full instrument panel manoeuvres**									
IFF.1	**Determine and monitor the serviceability of flight instruments and instrument power sources**			1						
IFF.2	**Perform manoeuvres using full instrument panel**			1						
IFF.3	**Recover from upset situations and unusual attitudes**			1						

	Private Pilot Licence – Aeroplane Category Rating

LESSON PLAN AND TRAINING RECORD
PPL(A) 1: NAVIGATION EXERCISE #1

Flight no:	PPL(A)1.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- Navigation route: C150 / C152 YRED – YWSG – YKRY – YKCY – YCDR – YRED
- C172RG YRED – YWSG – YKRY- Wondai – YKCY – YCDR – YRED
- Introduction to pilot navigation and operations in Class G airspace

PRE-FLIGHT KNOWLEDGE
Long Briefing: 2.0 hours Pre-flight Briefing: 0.5 hour
Underpinning knowledge: as required

Content

Long briefing – Introduction to Flight Planning and Visual Navigation Techniques

- Navigation equipment
- Pre-flight briefing - obtaining and analysing weather forecasts, weather reports and NOTAMs
- Route selection and preparation of navigation charts
- Factors influencing choice of cruising levels
- Last light calculations and considerations
- Calculation of estimated fuel consumption, fuel reserves, operational requirements and preparation of fuel log
- Preparation and submission of flight plan
- Departure and arrival procedures/restrictions – non-towered aerodrome or landing area
- Operations in Class G airspace, airspace restrictions (prohibited, restricted and danger areas)
- Visual navigation techniques (e.g. dead reckoning, ‘time-to-map-to-ground’, the ‘one-in-sixty’ rule)
- Navigation checklist procedures, maintenance of navigation log
- Engine handling considerations, fuel management and use of fuel log
- Radio communication procedures
- SAR requirements

Underpinning knowledge

- Dead reckoning navigation [NAV 4(c)]
- Decode NOTAM [ONTA 4(a)]
- Aerodrome ground markings and lighting [ONTA 4(b)]
- Standard RT phraseology for operations at non-towered aerodromes and landing areas [ONTA 4(c)]
- Transponder codes for G airspace [ONTA 4(e)]
- Class G airspace [OGA]
- Revise other underpinning knowledge as applicable (e.g. visual meteorological conditions, weight and balance calculations, performance chart calculations, cockpit preparation)

LESSON PLAN AND TRAINING RECORD
PPL(A) 1: NAVIGATION EXERCISE #1

PRE-FLIGHT KNOWLEDGE **Long Briefing: 2.0 hours Pre-flight Briefing: 0.5 hour** **Underpinning knowledge: as required**	
Content	
HF & NTS • Effective communication under normal circumstances [NTS1 4(a), NTS2 4(i)] • Task management [NTS1 & NTS2 4(b)] • Use of checklists and standard operating procedures to prevent errors [NTS2 4(h)]	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 2.5 hours dual

MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
NAV.1	**Prepare documents and flight plan**		
(a)	select and prepare appropriate navigation charts for the intended flight	3	
(b)	select a suitable route and altitude considering weather, terrain, airspace, NOTAMs and alternate landing areas	3	
(c)	obtain and interpret meteorological forecasts, NOTAMs and operational information applicable to the planned flight	3	
(d)	determine whether the planned flight can be conducted under the applicable flight rules and taking account of the beginning and end of daylight times	3	
(f)	complete a flight plan to the planned destination and alternates	3	
(g)	lodge suitable flight notification for search and rescue (SAR) purposes	3	
ONTA.1	**Non-towered aerodrome – pre-flight preparation**		
(a)	using a current ERSA and NOTAM, for the non-towered aerodrome or landing area, extract all of the relevant operational information	3	
(b)	interpret the extracted information	3	
(c)	identify all special aerodrome procedures	3	
(d)	check current weather forecast and local observations	3	

LESSON PLAN AND TRAINING RECORD
PPL(A) 1: NAVIGATION EXERCISE #1

FLIGHT TRAINING Suggested flight time: 2.5 hours dual			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard Required	 Achieved*
(e)	identify all relevant radio and navigation aid frequencies	3	
ONTA.2	**Taxi aircraft at a non-towered aerodrome or landing area**		
(a)	refer to aerodrome or landing area chart (if available)	3	
(b)	set local QNH or area QNH	3	
(c)	broadcast intentions on appropriate frequency	3	
(d)	obtain and interpret traffic information	3	
(e)	maintain lookout for, and separation from, other aircraft, wildlife and other obstructions	3	
(f)	recognise ground markings during taxi and take appropriate action	3	
(h)	taxi aircraft to holding point	3	
(i)	use strobes when crossing any runway	3	
ONTA.3	**Perform departure at a non-towered aerodrome or landing area**		
(a)	check and ensure runway approach is clear prior to entering a runway	3	
(b)	correctly set transponder code and mode prior to entering runway for take-off	3	
(c)	confirm runway approaches clear in all directions prior to entering runway	3	
(d)	broadcast line up details	3	
(f)	transmit appropriate radio calls and maintain separation with other aircraft	3	
(g)	advise air service provider of departure details, if required	3	
(h)	conduct departure	3	
NAV.3	**Conduct departure procedures**		
(a)	organise cockpit to ensure charts, documentation and navigational calculator are accessible from the control seat	3	
(b)	comply with all departure procedures, clearances and noise abatement requirements	3	
(c)	establish planned track on departure within 5 nm of airfield or apply alternative procedure if required	3	
(d)	calculate estimated time of arrival (ETA) for first waypoint	3	
NAV.4	**Navigate aircraft enroute**		
(a)	maintain a navigation cycle that ensures accurate tracking, and apply track correctional techniques to re-establish track prior to waypoint or destination	3	
(b)	maintain heading to achieve a nominated track	3	
(c)	maintain and revise ETAs (±2 minutes) for waypoint or destination	3	
(e)	navigate using accepted map-reading techniques	3	
(f)	maintain navigation and fuel log to monitor tracking, ETAs and fuel status	3	
(g)	use appropriate techniques to obtain a positive fix at suitable intervals	3	
(h)	maintain awareness of route, enroute terrain, enroute and destination weather, and react appropriately to changing weather conditions	3	
(i)	perform pre-descent and turning point checks	3	
(j)	maintain appropriate radio communication and listening watch with ATS and other aircraft if radio is fitted and used	3	
(l)	maintain awareness of search and rescue times (SARTIME) and revise as required	3	
(m)	monitor aircraft systems, manage fuel and engine to ensure aircraft is operated to achieve flight plan objectives	3	
NAV.2	**Comply with airspace procedures while navigating**		
(a)	identify airspace restrictions and dimensions applicable to the flight	3	
(b)	obtain and comply with air traffic clearances, if applicable	3	
(c)	comply with airspace procedures applicable to the airspace classification throughout the flight	3	

LESSON PLAN AND TRAINING RECORD
PPL(A) 1: NAVIGATION EXERCISE #1

FLIGHT TRAINING Suggested flight time: 2.5 hours dual		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved*
OGA	**Operate aircraft in Class G airspace**		
(a)	maintain tracking and altitude tolerances to remain outside controlled airspace	3	
(b)	apply separation tolerances between IFR flights, and IFR and VFR flights	3	
(c)	when using an aircraft radio:		
	(i) monitor appropriate radio frequency	3	
	(ii) make appropriate radio calls	3	
	(iii) obtain operational information from air services provider and other aircraft	3	
	(iv) use information to ensure aircraft separation is maintained	3	
(d)	using a suitable chart:		
	(i) operate clear of active aerodromes and landing areas in the vicinity of the aircraft	3	
	(ii) identify and remain clear of controlled and restricted airspace	3	
	(iii) take appropriate action when operating in the vicinity of a danger area	3	
NAV.8	**Use instrument navigation systems**		
(a)	initialise navigation system (as applicable)	3	
(b)	conduct navigation system validity check (as applicable)	3	
(c)	conduct RAIM check if required	3	
(d)	select, load, check and activate the flight plan (as applicable)	3	
(e)	navigate on departure, enroute and on arrival using GNSS	3	
(f)	operate instrument navigation systems correctly	3	
(g)	use instrument navigation systems to assist with navigation	3	
(h)	confirm waypoints and fixes using instrument navigation systems	3	
NAV.9	**Execute arrival procedures**		
(a)	obtain updated relevant aerodrome information	3	
(b)	determine landing direction and aerodrome suitability	3	
(c)	conduct arrival	3	
(d)	identify and avoid all traffic	3	
(e)	observe local and published noise abatement requirements and curfews	3	
(f)	cancel SARWATCH	3	
ONTA.4	**Perform arrival and landing at a non-towered aerodrome or landing area**		
(a)	check ERSA and NOTAM prior to entering circuit area	3	
(b)	set correct area or local QNH	3	
(c)	use correct radio frequency to transmit inbound calls as required	3	
(d)	maintain effective lookout	3	
(e)	maintain aircraft separation and avoid other traffic	3	
(f)	maintain tracking tolerances	3	
(g)	determine wind velocity	3	
(h)	determine landing direction	3	
(i)	confirm runway is serviceable for the operation	3	
(j)	determine circuit direction	3	
(k)	conduct landing area inspection (if applicable)	3	

LESSON PLAN AND TRAINING RECORD
PPL(A) 1: NAVIGATION EXERCISE #1

FLIGHT TRAINING **Suggested flight time: 2.5 hours dual**			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	**Achieved***
(l)	position aircraft in the circuit in preparation for landing and maintain separation from traffic	3	
(m)	make all necessary circuit radio calls	3	
(n)	verify runway is clear of other traffic, wildlife and other obstructions	3	
(o)	land the aircraft	3	
(p)	vacate runway	3	
(q)	cancel SARWATCH, if applicable	3	
C1.1	**Communicating face-to-face**	**1**	

***Enter the performance standard achieved if it is different to that required**
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

Private Pilot Licence – Aeroplane Category Rating

LESSON PLAN AND TRAINING RECORD
PPL(A) 2: NAVIGATION EXERCISE #2

Flight no:	PPL(A)2.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Navigation route: C150/152 YRED – YBSU – YGYM- YWND- YKCY- YRED
- C172RG YRED – YBSU – YGYM- YMYB - YWND- YKCY- YRED
- Introduction to operations at controlled aerodromes and controlled airspace procedures
- Flying for range and endurance
- Low level navigation
- Lost procedure
- Procedure when encountering turbulence
- Radio failure procedures
- Practice forced landing
- Basic instrument flight revision, straight and level, climbing, descending

PRE-FLIGHT KNOWLEDGE
Long Briefing: 1.5 hours Pre-flight Briefing: 0.5 hour
Underpinning knowledge: as required

Content

Long briefing – Preparation for and overview of navigation exercise #2
- Controlled airspace procedures
- Departure and arrival procedures/restrictions – controlled aerodromes
- Use of navigation aids and systems as a supplement to visual navigation – introduction to basic concepts, requirements and restrictions
- Pre-flight operational decision making – carrying additional fuel, planning for holding and alternate aerodromes
- Circumstances for which a diversion may be required, planning and carrying out a diversion
- Calculating and flying for range and endurance
- Navigation at low level
- Procedure when unsure of position

Underpinning knowledge
- Basic GNSS principles [NAV 4(a)]
- Enroute GNSS navigation principles [NAV 4(b)]
- Diversion considerations and procedures [NAV 4(e)]
- Radio failure procedures in ERSA [ONTA 4(d)]
- Decode NOTAMs, aerodrome ground markings and lighting, standard RT phraseology for operations at controlled aerodromes, radio failure procedures in the ERSA, transponder codes [CTA 4(a)-(e), CTR 4(a)-(e)]
- Revise underpinning knowledge applicable to basic instrument flight

LESSON PLAN AND TRAINING RECORD
PPL(A) 2: NAVIGATION EXERCISE #2

PRE-FLIGHT KNOWLEDGE **Long Briefing: 1.5 hours Pre-flight Briefing: 0.5 hour** **Underpinning knowledge: as required**
Content
HF & NTS • Task management [NTS1 & NTS2 4(b)] • Threat and error management detailing processes that can be used to identify and mitigate or control threats and errors [NTS2 4(b)] • The application of situation awareness to identifying real or potential environmental or operational threats to flight safety [NTS2 4(c)] • Developing and implementing plans of action for removing and mitigating threats, and removing and mitigating errors [NTS2 4(d)] • Undesired aircraft states, including prevention, identifying and controlling [NTS2 4(e)] • How an undesired aircraft state can develop from an unmanaged threat or error [NTS2 4(f)]
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points

Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 3.0 hours dual (0.3 IF)

MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** Required	**Performance Standard** Achieved*
NAV.1	**Prepare documents and flight plan**		
(a)	select and prepare appropriate navigation charts for the intended flight	2	
(b)	select a suitable route and altitude considering weather, terrain, airspace, NOTAMs and alternate landing areas	2	
(c)	obtain and interpret meteorological forecasts, NOTAMs and operational information applicable to the planned flight	2	
(d)	determine whether the planned flight can be conducted under the applicable flight rules and taking account of the beginning and end of daylight times	2	
(f)	complete a flight plan to the planned destination and alternates	2	
(g)	lodge suitable flight notification for search and rescue (SAR) purposes	2	

LESSON PLAN AND TRAINING RECORD
PPL(A) 2: NAVIGATION EXERCISE #2

FLIGHT TRAINING
Suggested flight time: 3.0 hours dual (0.3 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved*
ONTA.1	**Non-towered aerodrome – pre-flight preparation**		
(a)	using a current ERSA and NOTAM, for the non-towered aerodrome or landing area, extract all of the relevant operational information	**2**	
(b)	interpret the extracted information	**2**	
(c)	identify all special aerodrome procedures	**2**	
(d)	check current weather forecast and local observations	**2**	
(e)	identify all relevant radio and navigation aid frequencies	**2**	
CTR.1	**Controlled aerodrome pre-flight preparation**		
(a)	using a current ERSA and NOTAM, for the controlled aerodrome, extract all the relevant operational information	2	
(b)	interpret the extracted information	2	
(c)	identify all special aerodrome procedures	2	
(d)	check current weather forecast and local observations	2	
(e)	identify all relevant radio and navigation aid frequencies	2	
ONTA.2	**Taxi aircraft at a non-towered aerodrome or landing area**		
(a)	refer to aerodrome or landing area chart (if available)	2	
(b)	set local QNH or area QNH	2	
(c)	broadcast intentions on appropriate frequency	2	
(d)	obtain and interpret traffic information	2	
(e)	maintain lookout for, and separation from, other aircraft, wildlife and other obstructions	2	
(f)	recognise ground markings during taxi and take appropriate action	2	
(h)	taxi aircraft to holding point	2	
(i)	use strobes when crossing any runway	2	
ONTA.3	**Perform departure at a non-towered aerodrome or landing area**		
(a)	check and ensure runway approach is clear prior to entering a runway	**2**	
(b)	correctly set transponder code and mode prior to entering runway for take-off	**2**	
(c)	confirm runway approaches clear in all directions prior to entering runway	**2**	
(d)	broadcast line up details	**2**	
(f)	transmit appropriate radio calls and maintain separation with other aircraft	**2**	
(g)	advise air service provider of departure details, if required	**2**	
(h)	conduct departure	**2**	
NAV.3	**Conduct departure procedures**		
(a)	organise cockpit to ensure charts, documentation and navigational calculator are accessible from the control seat	**2**	
(b)	comply with all departure procedures, clearances and noise abatement requirements	**2**	
(c)	establish planned track on departure within 5 nm of airfield or apply alternative procedure if required	**2**	
(d)	calculate estimated time of arrival (ETA) for first waypoint	**2**	
NAV.4	**Navigate aircraft enroute**		
(a)	maintain a navigation cycle that ensures accurate tracking, and apply track correctional techniques to re-establish track prior to waypoint or destination	**2**	
(b)	maintain heading to achieve a nominated track	**2**	
(c)	maintain and revise ETAs (±2 minutes) for waypoint or destination	**2**	
(d)	maintain track in accordance with published flight path tolerances in controlled airspace	2	

LESSON PLAN AND TRAINING RECORD
PPL(A) 2: NAVIGATION EXERCISE #2

FLIGHT TRAINING Suggested flight time: 3.0 hours dual (0.3 IF)			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved*
(e)	navigate using accepted map-reading techniques	2	
(f)	maintain navigation and fuel log to monitor tracking, ETAs and fuel status	2	
(g)	use appropriate techniques to obtain a positive fix at suitable intervals	2	
(h)	maintain awareness of route, enroute terrain, enroute and destination weather, and react appropriately to changing weather conditions	2	
(i)	perform pre-descent and turning point checks	2	
(j)	maintain appropriate radio communication and listening watch with ATS and other aircraft if radio is fitted and used	2	
(k)	configure the aircraft as required for the following environmental and operational conditions:		
	(i) turbulence	2	
	(ii) holding	2	
	(iii) maximum range	2	
(l)	maintain awareness of search and rescue times (SARTIME) and revise as required	2	
(m)	monitor aircraft systems, manage fuel and engine to ensure aircraft is operated to achieve flight plan objectives	2	
NAV.2	**Comply with airspace procedures while navigating**		
(a)	identify airspace restrictions and dimensions applicable to the flight	2	
(b)	obtain and comply with air traffic clearances, if applicable	2	
(c)	comply with airspace procedures applicable to the airspace classification throughout the flight	2	
OGA	**Operate aircraft in Class G airspace**		
(a)	maintain tracking and altitude tolerances to remain outside controlled airspace	2	
(b)	apply separation tolerances between IFR flights, and IFR and VFR flights	2	
(c)	when using an aircraft radio:		
	(i) monitor appropriate radio frequency	2	
	(ii) make appropriate radio calls	2	
	(iii) obtain operational information from air services provider and other aircraft	2	
	(iv) use information to ensure aircraft separation is maintained	2	
	(v) apply loss of radio communication procedures	2	
(d)	using a suitable chart:		
	(i) operate clear of active aerodromes and landing areas in the vicinity of the aircraft	2	
	(ii) identify and remain clear of controlled and restricted airspace	2	
	(iii) take appropriate action when operating in the vicinity of a danger area	2	
(e)	perform actions in the event of abnormal operations and emergencies *(e.g. simulated complete or partial engine failure enroute)*	2	
(f)	recall transponder emergency code and communication failure code	2	
NAV.8	**Use instrument navigation systems**		
(a)	initialise navigation system (as applicable)	2	
(b)	conduct navigation system validity check (as applicable)	2	
(c)	conduct RAIM check if required	2	
(d)	select, load, check and activate the flight plan (as applicable)	2	
(e)	navigate on departure, enroute and on arrival using GNSS	2	
(f)	operate instrument navigation systems correctly	2	
(g)	use instrument navigation systems to assist with navigation	2	

LESSON PLAN AND TRAINING RECORD
PPL(A) 2: NAVIGATION EXERCISE #2

FLIGHT TRAINING
Suggested flight time: 3.0 hours dual (0.3 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard	
		Required	Achieved*
(h)	confirm waypoints and fixes using instrument navigation systems	**2**	
A3.2	**Maintain straight and level flight**		
(d)	for the following straight and level manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(v) at maximum range	**2**	
	(vi) at maximum endurance	**2**	
NAV.5	**Navigate at low level and in reduced visibility**		
(a)	configure the aircraft as required for the following environmental and operational conditions:		
	(i) reduced visibility	**2**	
	(ii) low cloud base	**2**	
(b)	navigate aeroplane at minimum heights (not below 500 ft AGL, clear of built-up areas) and remain in VMC	3	
(c)	maintain separation from terrain, obstacles, allowing for wind and turbulence at low level	3	
(d)	avoid noise sensitive areas	3	
(e)	operate appropriately in the vicinity of aerodromes and landing areas	3	
NAV.6	**Perform lost procedure**		
(a)	acknowledge positional uncertainty in a timely manner	**2**	
(b)	configure aircraft for range and endurance as required	**2**	
(c)	apply recognised method to re-establish aircraft position	**2**	
(d)	fix position	**2**	
(e)	use radio to request assistance, if applicable	**2**	
(f)	plan a timely precautionary search and landing if unable to complete flight safely to suitable aerodrome	**2**	
NAV.7	**Perform diversion procedure**		
(a)	make timely decision to divert	**2**	
(b)	identify an acceptable alternate aerodrome	**2**	
(c)	select a suitable route and cruising level	**2**	
(d)	revise flight plan considering weather, terrain, airspace and fuel available	**2**	
(e)	advise ATS of an intention to divert	**2**	
CTA.1	**Operate aircraft in controlled airspace**		
(a)	comply with airways clearance requirements for operating in all classes of airspace, including lead time required for flight plan submission, contents, ‘clearance void time’, and ‘readback’ requirement	3	
(b)	apply airways clearance requirements for entering, operating in and departing from CTA and CTR, including details that need to be provided to ATC, and what details to expect from ATC	3	
(c)	maintain control area protection tolerances	3	
(d)	maintain tracking and altitude tolerances when operating on an airways clearance	3	
(e)	reconfirm any clearance items when doubt exists	3	
(f)	advise ATC as soon as possible if unable to maintain clearance due to adverse weather conditions	3	
(g)	follow ATC requirements for a change of level in CTA, including in an emergency situation	3	
(h)	comply with departure, climb, transition to cruise (levelling out), cruise, change of levels, descent and visual approach procedures in CTA and CTR instructions	3	
(i)	apply separation standards between IFR flights, and IFR and VFR flights in the various classes of CTA	3	
(j)	perform appropriate actions in the event of the loss of radio communication in CTA and CTR	3	

LESSON PLAN AND TRAINING RECORD
PPL(A) 2: NAVIGATION EXERCISE #2

FLIGHT TRAINING Suggested flight time: 3.0 hours dual (0.3 IF)			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
(k)	perform appropriate actions in the event of abnormal operations and emergency procedures in CTA and CTR	3	
(l)	operate under radar vectoring procedures, including radio procedures and phraseologies	3	
(m)	maximum permissible time interval between ATC transmissions during radar vectoring are not exceeded	3	
(n)	perform appropriate actions in the event of abnormal operations and emergencies	3	
(o)	recall transponder emergency code and communication failure code	**2**	
CTR.4	**Perform arrival and landing at controlled aerodrome**		
(a)	check ERSA and NOTAM prior to entering control area and extract required operational information	2	
(b)	receive ATIS and correctly set the appropriate QNH	2	
(c)	request and receive ATC clearance and set correct transponder code prior to entering control area	2	
(d)	advise ATC as soon as possible if unable to comply with clearance	3	
(e)	maintain lookout at all times	2	
(f)	update QNH as required	2	
(g)	maintain tracking tolerances	3	
(h)	establish aircraft on the correct leg of the circuit in preparation for landing and maintain separation from traffic	2	
(i)	confirm clearance to land	2	
(j)	vacate runway and obtain taxi clearance	2	
CTR.2	**Taxi aircraft at a controlled aerodrome**		
(a)	obtain and comply with ATC clearances	3	
(b)	manoeuvre aircraft to holding point as instructed and take appropriate action to avoid other aircraft and obstructions	2	
(c)	recognise ground markings during taxi and take appropriate action	2	
(d)	recognise lighting signals and take appropriate action	2	
(e)	identify airport runway incursion hotspots	2	
(f)	manoeuvre aircraft to avoid jet blast hazard	2	
(g)	request taxi guidance if unsure of position	2	
(h)	use strobes when crossing any runway	2	
CTR.3	**Perform departure from controlled aerodrome**		
(a)	receive and correctly read back an airways clearance	2	
(b)	check and ensure runway approach is clear prior to entering a runway	**1**	
(c)	correctly set transponder code and mode prior to entering runway for take-off	2	
(d)	comply with ATC departure instructions	3	
(e)	advise ATC as soon as possible if unable to comply with clearance	3	
(f)	contact approach with airborne report or give departure call to tower	3	
(g)	maintain lookout	2	
(h)	avoid wake turbulence	3	
(i)	comply with airways clearances within tracking and altitude tolerances and maintain traffic lookout until clear of the aerodrome control zone	3	
IFF.2	**Perform manoeuvres using full instrument panel**		
(b)	set and maintain power and attitude by reference to the full instrument panel to achieve the following:		
	(i) straight and level performance during normal cruise within the flight tolerances	2	
	(ii) nominated climb performance within the flight tolerances	2	

LESSON PLAN AND TRAINING RECORD
PPL(A) 2: NAVIGATION EXERCISE #2

FLIGHT TRAINING
Suggested flight time: 3.0 hours dual (0.3 IF)

MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
	(iii) descent performance within the flight tolerances	2	
NAV.9	**Execute arrival procedures**		
(a)	obtain updated relevant aerodrome information	2	
(b)	determine landing direction and aerodrome suitability	2	
(c)	conduct arrival	2	
(d)	identify and avoid all traffic	2	
(e)	observe local and published noise abatement requirements and curfews	2	
(f)	cancel SARWATCH	2	
ONTA.4	**Perform arrival and landing at a non-towered aerodrome or landing area**		
(a)	check ERSA and NOTAM prior to entering circuit area	2	
(b)	set correct area or local QNH	2	
(c)	use correct radio frequency to transmit inbound calls as required	2	
(d)	maintain effective lookout	2	
(e)	maintain aircraft separation and avoid other traffic	2	
(f)	maintain tracking tolerances	2	
(g)	determine wind velocity	2	
(h)	determine landing direction	2	
(i)	confirm runway is serviceable for the operation	2	
(j)	determine circuit direction	2	
(k)	conduct landing area inspection (if applicable)	2	
(l)	position aircraft in the circuit in preparation for landing and maintain separation from traffic	2	
(m)	make all necessary circuit radio calls	2	
(n)	verify runway is clear of other traffic, wildlife and other obstructions	2	
(o)	land the aircraft	2	
(p)	vacate runway	2	
(q)	cancel SARWATCH, if applicable	2	
NTS1.1	**Maintain effective lookout**		
(a)	maintain traffic separation using a systematic visual scan technique at a rate determined by traffic density, visibility and terrain	2	
(b)	maintain radio listening watch and interpret transmissions to determine traffic location and intentions	2	
(c)	perform airspace-cleared procedure before commencing any manoeuvre	2	
NTS1.2	**Maintain situational awareness**		
(a)	monitor all aircraft systems using a systematic scan technique	2	
(b)	collect information to facilitate ongoing system management	2	
(c)	monitor flight environment for deviations from planned operations	2	
(d)	collect flight environment information to update planned operations	2	
NTS1.3	**Assess situations and make decisions**		
(a)	identify problems	2	
(b)	analyse problems	2	
(c)	identify solutions	2	

LESSON PLAN AND TRAINING RECORD
PPL(A) 2: NAVIGATION EXERCISE #2

FLIGHT TRAINING Suggested flight time: 3.0 hours dual (0.3 IF)		Performance Standard	
MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Required	Achieved*
(d)	assess solutions and risks	2	
(e)	decide on a course of action	2	
(f)	communicate plans of action (if appropriate)	2	
(g)	allocate tasks for action (if appropriate)	2	
(h)	take actions to achieve optimum outcomes for the operation	2	
(i)	monitor progress against plan	2	
(j)	re-evaluate plan to achieve optimum outcomes	2	
NTS1.4	**Set priorities and manage tasks**		
(a)	organise workload and priorities to ensure optimum outcome of the flight	2	
(b)	plan events and tasks to occur sequentially	2	
(c)	anticipate events and tasks to ensure sufficient opportunity for completion	2	
(d)	use technology to reduce workload and improve cognitive and manipulative activities	2	
NTS1.5	**Maintain effective communications and interpersonal relationships**		
(a)	establish and maintain effective and efficient communications and interpersonal relationships with all stakeholders to ensure the optimum outcome of the flight	2	
(b)	define and explain objectives to stakeholders	2	
(c)	demonstrate a level of assertiveness that ensures the optimum completion of the flight	2	
NTS2.1	**Recognise and manage threats**		
(a)	identify relevant environmental or operational threats that are likely to affect the safety of the flight	2	
(b)	identify when competing priorities and demands may represent a threat to the safety of the flight	2	
(c)	develop and implement countermeasures to manage threats	2	
(d)	monitor and assess flight progress to ensure a safe outcome, or modify actions when a safe outcome is not assured	2	
NTS2.2	**Recognise and manage errors**		
(a)	apply checklists and standard operating procedures to prevent aircraft handling, procedural or communication errors	2	
(b)	identify committed errors before safety is affected or the aircraft enters an undesired state	2	
(c)	monitor the following to collect and analyse information to identify potential or actual errors:		
	(i) aircraft systems using a systematic scan technique	2	
	(ii) the flight environment	2	
	(iii) other crew	2	
(d)	implement countermeasures to prevent errors or take action in the time available to correct errors before the aircraft enters an undesired state	2	
NTS2.3	**Recognise and manage undesired aircraft state**		
(a)	recognise an undesired aircraft state	2	
(b)	prioritise tasks to ensure an undesired aircraft state is managed effectively	2	
(c)	apply corrective actions to recover an undesired aircraft state in a safe and timely manner	2	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

LESSON PLAN AND TRAINING RECORD
PPL(A) 2: NAVIGATION EXERCISE #2

CONSOLIDATION AND/OR REMEDIAL TRAINING			
		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carry-over/remedial training) • Trainee preparation for next lesson • Training record completion and sign-off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

Private Pilot Licence – Aeroplane Category Rating

LESSON PLAN AND TRAINING RECORD
PPL(A) 3: NAVIGATION EXERCISE #3

Flight no:	PPL(A)3.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Navigation route: C150/152 YRED- YCDR – YKCY – YKRY – YWSG – YRED
- C-172RG YRED- YCDR – YKCY – Wondai – YWSG – YRED
- Circuits at YCDA OR YKRY (decision made upon YCDA traffic density or Notamed YKRY gliding operations)
- **Verify** current competencies (competencies attained during RPL flight training - flight manoeuvres to be performed within the flight tolerances mentioned in Table 1, Schedule 8 of the Part 61 MOS)
- **Assess** competency to conduct first solo navigation exercise

PRE-FLIGHT KNOWLEDGE **Long Briefing: 1.0 hour Pre-flight Briefing: 0.5 hour** **Underpinning knowledge: as required**	
Content	
Long briefing – Preparation for and overview of navigation exercise #3 • Other revision as required	
Underpinning knowledge • Review/expand previously introduced knowledge as required • Tracking tolerances for radio navigation and GNSS aids • NDB – limitations, methods of selecting and using most appropriate NDB for tracking, tracking techniques, procedures and limitations • VOR – settings for command indications, VOR tracking techniques, procedures and limitations • GNSS principles, operation, performance limitations & errors, methods of position fixing, operating procedures, waypoint passage indications, operational and serviceability checks, human factors limitations, requirements applicable to pilots and equipment • Assess underpinning knowledge as required for the conduct of first solo navigation exercise	
HF & NTS • Review as required	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

LESSON PLAN AND TRAINING RECORD
PPL(A) 3: NAVIGATION EXERCISE #3

Performance Standard		
3	2	1
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 3.5 hours dual (0.3 IF)

MOS Reference	Lesson Content (Elements & Performance Criteria)	Performance Standard: Required	Performance Standard: Achieved*
NAV.1	Prepare documents and flight plan	2	
C4.1	Plan fuel requirements	1	
ONTA.1	Non-towered aerodrome – pre-flight preparation	2	
C2.1	Pre-flight actions and procedures	1	
C2.2	Perform pre-flight inspection	1	
C4.3	Refuel aircraft	1	
C5.1	Manage passengers	1	
C5.2	Aid and assist passengers	1	
C5.3	Manage cargo	1	
A1.1	Start and stop engine	1	
A1.2	Taxi aeroplane	1	
ONTA.2	Taxi aircraft at a non-towered aerodrome or landing area	2	
A2.1	Carry out pre take-off procedures	1	
A2.2	Take off aeroplane	1	
A2.3	Take off aeroplane in a crosswind	1	
A2.4	Carry out after take-off procedures	1	
A3.1	Climb aeroplane	1	
ONTA.3	Perform departure at a non-towered aerodrome or landing area	2	
NAV.3	Conduct departure procedures	2	
NAV.4	Navigate aircraft enroute	2	
NAV.2	Comply with airspace procedures while navigating	2	
OGA	Operate aircraft in Class G airspace	2	
C3.2	Manage R/T equipment malfunctions	1	
NAV.8	Use instrument navigation systems	2	
A3.2	Maintain straight and level flight *(slow speed, normal cruise, high speed cruise, cruise with flaps selected)*	1	
A3.3	Descend aeroplane	1	
A3.4	Turn aeroplane	1	
A3.5	Control aeroplane at slow speeds	1	

LESSON PLAN AND TRAINING RECORD
PPL(A) 3: NAVIGATION EXERCISE #3

FLIGHT TRAINING Suggested flight time: 3.5 hours dual (0.3 IF)			
MOS Reference	Lesson Content (Elements & Performance Criteria)	Performance Standard Required	Achieved*
NAV.5	**Navigate at low level and in reduced visibility**	**2**	
NAV.6	**Perform lost procedure**	**2**	
NAV.7	**Perform diversion procedure**	**2**	
CTA.1	**Operate aircraft in controlled airspace**	2	
CTR.4	**Perform arrival and landing at controlled aerodrome**		
(d)	advise ATC as soon as possible if unable to comply with clearance	2	
(g)	maintain tracking tolerances	2	
CTR.2	**Taxi aircraft at a controlled aerodrome**		
(a)	obtain and comply with ATC clearances	2	
CTR.3	**Perform departure from controlled aerodrome**	2	
(a)	check and ensure runway approach is clear prior to entering a runway	**1**	
(d)	comply with ATC departure instructions	2	
(e)	advise ATC as soon as possible if unable to comply with clearance	2	
(f)	contact approach with airborne report or give departure call to tower	2	
(h)	avoid wake turbulence	2	
(i)	comply with airways clearances within tracking and altitude tolerances and maintain traffic lookout until clear of the aerodrome control zone	2	
IFF.1	**Determine and monitor the serviceability of flight instruments and instrument power sources**	**1**	
IFF.2	**Perform manoeuvres using full instrument panel** *(simulated inadvertent entry into IMC – rate one turn onto nominated heading)*	**1**	
(b)	set and maintain power and attitude by reference to the full instrument panel to achieve the following:		
	(i) straight and level performance during normal cruise within the flight tolerances	**1**	
	(ii) nominated climb performance within the flight tolerances	**1**	
	(iii) descent performance within the flight tolerances	**1**	
IFF.3	**Recover from upset situations and unusual attitudes**	**1**	
NAV.9	**Execute arrival procedures**	**2**	
ONTA.4	**Perform arrival and landing at a non-towered aerodrome or landing area**	**2**	
A3.6	**Perform circuits and approaches**	**1**	
A2.5	**Take off aeroplane from ‘short field’**	**1**	
A3.7	**Local area airspace**	**1**	
A4.1	**Land aeroplane**	**1**	
A4.2	**Land aeroplane in a crosswind**	**1**	
A4.3	**Conduct a missed approach**	**1**	
A4.4	**Perform recovery from missed landing**	**1**	
A4.5	**Short landing**	**1**	

LESSON PLAN AND TRAINING RECORD
PPL(A) 3: NAVIGATION EXERCISE #3

FLIGHT TRAINING Suggested flight time: 3.5 hours dual (0.3 IF)			
MOS Reference	Lesson Content (Elements & Performance Criteria)	Performance Standard: Required	Performance Standard: Achieved*
NTS1.1	Maintain effective lookout	2	
NTS1.2	Maintain situational awareness	2	
NTS1.3	Assess situations and make decisions	2	
NTS1.4	Set priorities and manage tasks	2	
NTS1.5	Maintain effective communications and interpersonal relationships	2	
NTS2.1	Recognise and manage threats	2	
NTS2.2	Recognise and manage errors	2	
NTS2.3	Recognise and manage undesired aircraft state	2	
C2.3	Post-flight actions and procedures	1	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING			
MOS Reference	Lesson Content (Elements & Performance Criteria)	Performance Standard: Required	Performance Standard: Achieved

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (first solo navigation exercise, or any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

	LESSON PLAN AND TRAINING RECORD **PPL(A) 3: NAVIGATION EXERCISE #3**

COMMENTS AND OUTCOME		
Proceed to first solo navigation exercise?	**Yes**	**No**

 # The trainee must be assessed as capable of conducting the first solo navigation flight safely. The requirements of CASR Parts 61 and 141 must also be met.

Instructor's signature & date	**Trainee's signature & date**

Private Pilot Licence – Aeroplane Category Rating

LESSON PLAN AND TRAINING RECORD
PPL(A) 4: FIRST SOLO NAVIGATION EXERCISE

Flight no:	PPL(A)4	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- First solo navigation exercise – outside controlled airspace
- Navigation route: C150/152 YRED – YWSG – YKRY – YKCY – YCDR – YRED
- C172RG YRED – YWSG – YKRY – WONDAI -YKCY – YCDR – YRED
- **Suggested flight time: 2.5 hours**

Operational Limitations:

During solo flight, trainees must only be authorised to practise sequences that have been assessed to performance standard 2 or 1, on a minimum of two separate flights.

Except in emergency or urgency situations, or in the interests of maintaining safety, the trainee must not operate contrary to the limitations and guidelines specified by the authorising flight instructor.

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor’s signature & date	Trainee’s signature & date

LESSON PLAN AND TRAINING RECORD
PPL(A) 4: FIRST SOLO CIRCUIT

Private Pilot Licence – Aeroplane Category Rating

LESSON PLAN AND TRAINING RECORD
PPL(A) 5: NAVIGATION EXERCISE #5

Flight no:	PPL(A)5.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Navigation route: C150/152 YRED – YBAF – YHEC – GOODNA – DAYBOROUGH – NANANGO – YRED
- C172RG YRED – YBAF – YHEC – GOODNA – DAYBOROUGH – NANANGO –YKRY - YRED
- Circuits (including circuit emergencies) at YHEC
- **Verify** current competencies (competencies attained during RPL flight training - flight manoeuvres to be performed within the flight tolerances mentioned in Table 1, Schedule 8 of the Part 61 MOS)

PRE-FLIGHT KNOWLEDGE **Long Briefing: 1.0 hour Pre-flight Briefing: 0.5 hour** **Underpinning knowledge: as required**	
Content	
Long briefing – Preparation for and overview of navigation exercise #5 • Emergency and survival procedures • Other revision as required	
Underpinning knowledge • Navigate over featureless terrain and extended over-water flights [NAV 4(d)] • Maximum payload and minimum fuel operations [NAV 4(f)] • Review/expand previously introduced knowledge as required	
HF & NTS • Revise as required	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Theory Examination • PPLA aeronautical knowledge examination • Knowledge deficiency report (required when the knowledge examination pass is less than 100%)	
Pre-flight knowledge components complete:	**Instructor's signature & date**

LESSON PLAN AND TRAINING RECORD
PPL(A) 5: NAVIGATION EXERCISE #5

LESSON PLAN AND TRAINING RECORD
PPL(A) 5: NAVIGATION EXERCISE #5

Performance Standard		
3	2	1
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 3.0 hours dual (0.2 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
NAV.1	**Prepare documents and flight plan**		
(a)	select and prepare appropriate navigation charts for the intended flight	1	
(b)	select a suitable route and altitude considering weather, terrain, airspace, NOTAMs and alternate landing areas	1	
(c)	obtain and interpret meteorological forecasts, NOTAMs and operational information applicable to the planned flight	1	
(d)	determine whether the planned flight can be conducted under the applicable flight rules and taking account of the beginning and end of daylight times	1	
(f)	complete a flight plan to the planned destination and alternates	1	
(g)	lodge suitable flight notification for search and rescue (SAR) purposes	1	
ONTA.1	**Non-towered aerodrome – pre-flight preparation**		
(a)	using a current ERSA and NOTAM, for the non-towered aerodrome or landing area, extract all of the relevant operational information	1	
(b)	interpret the extracted information	1	
(c)	identify all special aerodrome procedures	1	
(d)	check current weather forecast and local observations	1	
(e)	identify all relevant radio and navigation aid frequencies	1	
CTR.1	**Controlled aerodrome pre-flight preparation**		
(a)	using a current ERSA and NOTAM, for the controlled aerodrome, extract all the relevant operational information	1	
(b)	interpret the extracted information	1	
(c)	identify all special aerodrome procedures	1	
(d)	check current weather forecast and local observations	1	
(e)	identify all relevant radio and navigation aid frequencies	1	
ONTA.3	**Perform departure at a non-towered aerodrome or landing area**		
(a)	check and ensure runway approach is clear prior to entering a runway	1	
(b)	correctly set transponder code and mode prior to entering runway for take-off	1	
(c)	confirm runway approaches clear in all directions prior to entering runway	1	
(d)	broadcast line up details	1	
(f)	transmit appropriate radio calls and maintain separation with other aircraft	1	
(g)	advise air service provider of departure details, if required	1	
(h)	conduct departure	1	
NAV.3	**Conduct departure procedures**		
(a)	organise cockpit to ensure charts, documentation and navigational calculator are accessible from the control seat	1	
(b)	comply with all departure procedures, clearances and noise abatement requirements	1	

LESSON PLAN AND TRAINING RECORD
PPL(A) 5: NAVIGATION EXERCISE #5

FLIGHT TRAINING Suggested flight time: 3.0 hours dual (0.2 IF)		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved*
(c)	establish planned track on departure within 5 nm of airfield or apply alternative procedure if required	1	
(d)	calculate estimated time of arrival (ETA) for first waypoint	1	
C1.2	**Operational communication using an aeronautical radio**	1	
NAV.4	**Navigate aircraft enroute**		
(a)	maintain a navigation cycle that ensures accurate tracking, and apply track correctional techniques to re-establish track prior to waypoint or destination	1	
(b)	maintain heading to achieve a nominated track	1	
(c)	maintain and revise ETAs (±2 minutes) for waypoint or destination	1	
(d)	maintain track in accordance with published flight path tolerances in controlled airspace	1	
(e)	navigate using accepted map-reading techniques	1	
(f)	maintain navigation and fuel log to monitor tracking, ETAs and fuel status	1	
(g)	use appropriate techniques to obtain a positive fix at suitable intervals	1	
(h)	maintain awareness of route, enroute terrain, enroute and destination weather, and react appropriately to changing weather conditions	1	
(i)	perform pre-descent and turning point checks	1	
(j)	maintain appropriate radio communication and listening watch with ATS and other aircraft if radio is fitted and used	1	
(k)	configure the aircraft as required for the following environmental and operational conditions:		
	(i) turbulence	1	
	(ii) holding	1	
	(iii) maximum range	1	
(l)	maintain awareness of search and rescue times (SARTIME) and revise as required	1	
(m)	monitor aircraft systems, manage fuel and engine to ensure aircraft is operated to achieve flight plan objectives	1	
NAV.2	**Comply with airspace procedures while navigating**		
(a)	identify airspace restrictions and dimensions applicable to the flight	1	
(b)	obtain and comply with air traffic clearances, if applicable	1	
(c)	comply with airspace procedures applicable to the airspace classification throughout the flight	1	
OGA	**Operate aircraft in Class G airspace**		
(a)	maintain tracking and altitude tolerances to remain outside controlled airspace	1	
(b)	apply separation tolerances between IFR flights, and IFR and VFR flights	1	
(c)	when using an aircraft radio:		
	(i) monitor appropriate radio frequency	1	
	(ii) make appropriate radio calls	1	
	(iii) obtain operational information from air services provider and other aircraft	1	
	(iv) use information to ensure aircraft separation is maintained	1	
	(v) apply loss of radio communication procedures	1	
(d)	using a suitable chart:		
	(i) operate clear of active aerodromes and landing areas in the vicinity of the aircraft	1	
	(ii) identify and remain clear of controlled and restricted airspace	1	
	(iii) take appropriate action when operating in the vicinity of a danger area	1	
(e)	perform actions in the event of abnormal operations and emergencies *(simulated electrical failure enroute, simulated unreliable airspeed indication)*	1	

LESSON PLAN AND TRAINING RECORD
PPL(A) 5: NAVIGATION EXERCISE #5

FLIGHT TRAINING
Suggested flight time: 3.0 hours dual (0.2 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
(f)	recall transponder emergency code and communication failure code	1	
C3.1	**Operate radio equipment**	1	
C3.3	**Operate transponder**	1	
NAV.8	**Use instrument navigation systems**		
(a)	initialise navigation system (as applicable)	1	
(b)	conduct navigation system validity check (as applicable)	1	
(c)	conduct RAIM check if required	1	
(d)	select, load, check and activate the flight plan (as applicable)	1	
(e)	navigate on departure, enroute and on arrival using GNSS	1	
(f)	operate instrument navigation systems correctly	1	
(g)	use instrument navigation systems to assist with navigation	1	
(h)	confirm waypoints and fixes using instrument navigation systems	1	
A3.2	**Maintain straight and level flight** *(maximum range and endurance)*	1	
NAV.5	**Navigate at low level and in reduced visibility**		
(a)	configure the aircraft as required for the following environmental and operational conditions:		
	(i) reduced visibility	1	
	(ii) low cloud base	1	
(b)	navigate aeroplane at minimum heights (not below 500 ft AGL, clear of built-up areas) and remain in VMC	1	
(c)	maintain separation from terrain, obstacles, allowing for wind and turbulence at low level	1	
(d)	avoid noise sensitive areas	1	
(e)	operate appropriately in the vicinity of aerodromes and landing areas	1	
NAV.6	**Perform lost procedure**		
(a)	acknowledge positional uncertainty in a timely manner	1	
(b)	configure aircraft for range and endurance as required	1	
(c)	apply recognised method to re-establish aircraft position	1	
(d)	fix position	1	
(e)	use radio to request assistance, if applicable	1	
(f)	plan a timely precautionary search and landing if unable to complete flight safely to suitable aerodrome	1	
NAV.7	**Perform diversion procedure**		
(a)	make timely decision to divert	1	
(b)	identify an acceptable alternate aerodrome	1	
(c)	select a suitable route and cruising level	1	
(d)	revise flight plan considering weather, terrain, airspace and fuel available	1	
(e)	advise ATS of an intention to divert	1	
CTA.1	**Operate aircraft in controlled airspace**		
(a)	comply with airways clearance requirements for operating in all classes of airspace, including lead time required for flight plan submission, contents, ‘clearance void time’, and ‘readback’ requirement	1	
(b)	apply airways clearance requirements for entering, operating in and departing from CTA and CTR, including details that need to be provided to ATC, and what details to expect from ATC	1	
(c)	maintain control area protection tolerances	1	

LESSON PLAN AND TRAINING RECORD
PPL(A) 5: NAVIGATION EXERCISE #5

FLIGHT TRAINING
Suggested flight time: 3.0 hours dual (0.2 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
(d)	maintain tracking and altitude tolerances when operating on an airways clearance	1	
(e)	reconfirm any clearance items when doubt exists	1	
(f)	advise ATC as soon as possible if unable to maintain clearance due to adverse weather conditions	1	
(g)	follow ATC requirements for a change of level in CTA, including in an emergency situation	1	
(h)	comply with departure, climb, transition to cruise (levelling out), cruise, change of levels, descent and visual approach procedures in CTA and CTR instructions	1	
(i)	apply separation standards between IFR flights, and IFR and VFR flights in the various classes of CTA	1	
(j)	perform appropriate actions in the event of the loss of radio communication in CTA and CTR	1	
(k)	perform appropriate actions in the event of abnormal operations and emergency procedures in CTA and CTR	1	
(l)	operate under radar vectoring procedures, including radio procedures and phraseologies	1	
(m)	maximum permissible time interval between ATC transmissions during radar vectoring are not exceeded	1	
(n)	perform appropriate actions in the event of abnormal operations and emergencies	1	
(o)	recall transponder emergency code and communication failure code	1	
CTR.4	**Perform arrival and landing at controlled aerodrome**		
(a)	check ERSA and NOTAM prior to entering control area and extract required operational information	1	
(b)	receive ATIS and correctly set the appropriate QNH	1	
(c)	request and receive ATC clearance and set correct transponder code prior to entering control area	1	
(d)	advise ATC as soon as possible if unable to comply with clearance	1	
(e)	maintain lookout at all times	1	
(f)	update QNH as required	1	
(g)	maintain tracking tolerances	1	
(h)	establish aircraft on the correct leg of the circuit in preparation for landing and maintain separation from traffic	1	
(i)	confirm clearance to land	1	
(j)	vacate runway and obtain taxi clearance	1	
CTR.2	**Taxi aircraft at a controlled aerodrome**		
(a)	obtain and comply with ATC clearances	1	
(b)	manoeuvre aircraft to holding point as instructed and take appropriate action to avoid other aircraft and obstructions	1	
(c)	recognise ground markings during taxi and take appropriate action	1	
(d)	recognise lighting signals and take appropriate action	1	
(e)	identify airport runway incursion hotspots	1	
(f)	manoeuvre aircraft to avoid jet blast hazard	1	
(g)	request taxi guidance if unsure of position	1	
(h)	use strobes when crossing any runway	1	
CTR.3	**Perform departure from controlled aerodrome**		
(a)	receive and correctly read back an airways clearance	1	
(c)	correctly set transponder code and mode prior to entering runway for take-off	1	
(d)	comply with ATC departure instructions	1	
(e)	advise ATC as soon as possible if unable to comply with clearance	1	
(f)	contact approach with airborne report or give departure call to tower	1	
(g)	maintain lookout	1	

LESSON PLAN AND TRAINING RECORD
PPL(A) 5: NAVIGATION EXERCISE #5

FLIGHT TRAINING Suggested flight time: 3.0 hours dual (0.2 IF)			
		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved*
(h)	avoid wake turbulence	1	
(i)	comply with airways clearances within tracking and altitude tolerances and maintain traffic lookout until clear of the aerodrome control zone	1	
IFF.2	**Perform manoeuvres using full instrument panel**		
(b)	set and maintain power and attitude by reference to the full instrument panel to achieve the following:		
	(i) straight and level performance during normal cruise within the flight tolerances	1	
	(ii) nominated climb performance within the flight tolerances	1	
	(iii) descent performance within the flight tolerances	1	
C4.2	**Manage fuel system**		
A5.1	**Enter and recover from stall**	1	
A5.2	**Recover from incipient spin**	1	
A5.3	**Turn aeroplane steeply**	1	
A5.4	**Sideslip aeroplane (where flight manual permits)**	1	
A6.1	**Manage engine failure - take-off (simulated)**	1	
A6.2	**Manage engine failure in the circuit area (simulated)**	1	
A6.3	**Perform forced landing (simulated)**	1	
A6.4	**Conduct precautionary search and landing (simulated condition)**	1	
A6.5	**Manage other abnormal situations (simulated)**	1	
A6.6	**Recover from unusual flight attitudes**	1	
NAV.9	**Execute arrival procedures**		
(a)	obtain updated relevant aerodrome information	1	
(b)	determine landing direction and aerodrome suitability	1	
(c)	conduct arrival	1	
(d)	identify and avoid all traffic	1	
(e)	observe local and published noise abatement requirements and curfews	1	
(f)	cancel SARWATCH	1	
ONTA.4	**Perform arrival and landing at a non-towered aerodrome or landing area**		
(a)	check ERSA and NOTAM prior to entering circuit area	1	
(b)	set correct area or local QNH	1	
(c)	use correct radio frequency to transmit inbound calls as required	1	
(d)	maintain effective lookout	1	
(e)	maintain aircraft separation and avoid other traffic	1	
(f)	maintain tracking tolerances	1	
(g)	determine wind velocity	1	
(h)	determine landing direction	1	
(i)	confirm runway is serviceable for the operation	1	
(j)	determine circuit direction	1	
(k)	conduct landing area inspection (if applicable)	1	
(l)	position aircraft in the circuit in preparation for landing and maintain separation from traffic	1	
(m)	make all necessary circuit radio calls	1	

LESSON PLAN AND TRAINING RECORD
PPL(A) 5: NAVIGATION EXERCISE #5

FLIGHT TRAINING
Suggested flight time: 3.0 hours dual (0.2 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved*
(n)	verify runway is clear of other traffic, wildlife and other obstructions	1	
(o)	land the aircraft	1	
(p)	vacate runway	1	
(q)	cancel SARWATCH, if applicable	1	
NTS1.1	**Maintain effective lookout**		
(a)	maintain traffic separation using a systematic visual scan technique at a rate determined by traffic density, visibility and terrain	1	
(b)	maintain radio listening watch and interpret transmissions to determine traffic location and intentions	1	
(c)	perform airspace-cleared procedure before commencing any manoeuvre	1	
NTS1.2	**Maintain situational awareness**		
(a)	monitor all aircraft systems using a systematic scan technique	1	
(b)	collect information to facilitate ongoing system management	1	
(c)	monitor flight environment for deviations from planned operations	1	
(d)	collect flight environment information to update planned operations	1	
NTS1.3	**Assess situations and make decisions**		
(a)	identify problems	1	
(b)	analyse problems	1	
(c)	identify solutions	1	
(d)	assess solutions and risks	1	
(e)	decide on a course of action	1	
(f)	communicate plans of action (if appropriate)	1	
(g)	allocate tasks for action (if appropriate)	1	
(h)	take actions to achieve optimum outcomes for the operation	1	
(i)	monitor progress against plan	1	
(j)	re-evaluate plan to achieve optimum outcomes	1	
NTS1.4	**Set priorities and manage tasks**		
(a)	organise workload and priorities to ensure optimum outcome of the flight	1	
(b)	plan events and tasks to occur sequentially	1	
(c)	anticipate events and tasks to ensure sufficient opportunity for completion	1	
(d)	use technology to reduce workload and improve cognitive and manipulative activities	1	
NTS1.5	**Maintain effective communications and interpersonal relationships**		
(a)	establish and maintain effective and efficient communications and interpersonal relationships with all stakeholders to ensure the optimum outcome of the flight	1	
(b)	define and explain objectives to stakeholders	1	
(c)	demonstrate a level of assertiveness that ensures the optimum completion of the flight	1	
NTS2.1	**Recognise and manage threats**		
(a)	identify relevant environmental or operational threats that are likely to affect the safety of the flight	1	
(b)	identify when competing priorities and demands may represent a threat to the safety of the flight	1	
(c)	develop and implement countermeasures to manage threats	1	
(d)	monitor and assess flight progress to ensure a safe outcome, or modify actions when a safe outcome is not assured	1	

LESSON PLAN AND TRAINING RECORD
PPL(A) 5: NAVIGATION EXERCISE #5

FLIGHT TRAINING Suggested flight time: 3.0 hours dual (0.2 IF)		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Required**	**Achieved***
NTS2.2	**Recognise and manage errors**		
(a)	apply checklists and standard operating procedures to prevent aircraft handling, procedural or communication errors	**1**	
(b)	identify committed errors before safety is affected or the aircraft enters an undesired state	**1**	
(c)	monitor the following to collect and analyse information to identify potential or actual errors:		
	(i) aircraft systems using a systematic scan technique	**1**	
	(ii) the flight environment	**1**	
	(iii) other crew	**1**	
(d)	implement countermeasures to prevent errors or take action in the time available to correct errors before the aircraft enters an undesired state	**1**	
NTS2.3	**Recognise and manage undesired aircraft state**		
(a)	recognise an undesired aircraft state	**1**	
(b)	prioritise tasks to ensure an undesired aircraft state is managed effectively	**1**	
(c)	apply corrective actions to recover an undesired aircraft state in a safe and timely manner	**1**	

***Enter the performance standard achieved if it is different to that required**
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Required**	**Achieved**

LESSON PLAN AND TRAINING RECORD
PPL(A) 5: NAVIGATION EXERCISE #5

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

Private Pilot Licence – Aeroplane Category Rating

LESSON PLAN AND TRAINING RECORD
PPL(A) 6: NAVIGATION EXERCISE #6

Flight no:	PPL(A)6.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- Navigation route: C150/152 / C172RG YRED – YBSU – YHBA – YBUD – "SUNNY GLEN" – YWND - YRED
- Circuits at (25 42.59S 152 18.76E)
- Revise basic instrument flight
- **Assess** performance criteria in preparation for second solo navigation exercise and PPLA flight test
- Flight manoeuvres to be performed within the flight tolerances mentioned in Table 1, Schedule 8 of the Part 61 MOS

PRE-FLIGHT KNOWLEDGE **Long Briefing: 1.0 hour Pre-flight Briefing: 0.5 hour** **Underpinning knowledge: as required**	
Content	
Long briefing – Preparation for and overview of navigation exercise #6	
Underpinning knowledge • Review and assess flight test knowledge requirements	
HF & NTS • Revise as required	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

LESSON PLAN AND TRAINING RECORD
PPL(A) 6: NAVIGATION EXERCISE #6

FLIGHT TRAINING Suggested flight time: 3.5 hours dual (0.2 IF)			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved*
NAV.1	Prepare documents and flight plan	1	
ONTA.1	Non-towered aerodrome – pre-flight preparation	1	
CTR.1	Controlled aerodrome pre-flight preparation	1	
ONTA.2	Taxi aircraft at a non-towered aerodrome or landing area	1	
ONTA.3	Perform departure at a non-towered aerodrome or landing area	1	
NAV.3	Conduct departure procedures	1	
NAV.4	Navigate aircraft enroute	1	
NAV.2	Comply with airspace procedures while navigating	1	
OGA	Operate aircraft in Class G airspace	1	
NAV.8	Use instrument navigation systems	1	
A3.2	Maintain straight and level flight *(maximum range and endurance)*	1	
NAV.5	Navigate at low level and in reduced visibility	1	
NAV.6	Perform lost procedure	1	
NAV.7	Perform diversion procedure	1	
CTA.1	Operate aircraft in controlled airspace	1	
CTR.4	Perform arrival and landing at controlled aerodrome	1	
CTR.2	Taxi aircraft at a controlled aerodrome	1	
CTR.3	Perform departure from controlled aerodrome	1	
NAV.9	Execute arrival procedures	1	
ONTA.4	Perform arrival and landing at a non-towered aerodrome or landing area	1	
NTS1.1	Maintain effective lookout	1	
NTS1.2	Maintain situational awareness	1	
NTS1.3	Assess situations and make decisions	1	
NTS1.4	Set priorities and manage tasks	1	
NTS1.5	Maintain effective communications and interpersonal relationships	1	
NTS2.1	Recognise and manage threats	1	
NTS2.2	Recognise and manage errors	1	
NTS2.3	Recognise and manage undesired aircraft state	1	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

LESSON PLAN AND TRAINING RECORD
PPL(A) 6: NAVIGATION EXERCISE #6

CONSOLIDATION AND/OR REMEDIAL TRAINING			
		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Required**	**Achieved**

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to second solo navigation exercise?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

Private Pilot Licence – Aeroplane Category Rating

LESSON PLAN AND TRAINING RECORD
PPL(A) 7: SOLO NAVIGATION EXERCISE

Flight no:	PPL(A)7	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- Solo navex - CTA
- Navigation route:C150/152/172RG YRED – YESD – YGYM – YBSU - YRED
- **Suggested flight time: 3.0 hours**

**must be a minimum of 150nm, during which a full-stop landing is made at each of two aerodromes not within the flight training area for the departure aerodrome*

Operational Limitations:

During solo flight, trainees must only be authorised to practise sequences that have been assessed to performance standard 2 or 1, on a minimum of two separate flights.

Except in emergency or urgency situations, or in the interests of maintaining safety, the trainee must not operate contrary to the limitations and guidelines specified by the authorising flight instructor.

COMMENTS AND OUTCOME		
Proceed to PPLA flight test?#	**Yes**	**No**

#Each of the performance criteria contained within the units of competency for the Private Pilot Licence –Aeroplane Category Rating must have been assessed to performance standard 1, on a minimum of two separate flights. (For competencies already achieved during flight training for the RPL(A) and flight radio endorsement, the trainee's competency in each of these elements must be verified as set out in this training course).

Instructor's signature & date	Trainee's signature & date

ACCELERATED COMPETENCY

Flight no:		**Trainee name & ARN:**	
Date:		**Instructor:**	

FLIGHT TRAINING		
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard Achieved**

COMMENTS

Instructor's signature & date	**Trainee's signature & date**

This form is to be used to record the assessments which are made ahead of the syllabus schedule (i.e. not included in the lesson plan and training record form).

Enter the assessed performance criteria and the standard achieved. Attach the form to the lesson plan and training record form for the lesson in which the early assessment was made.

Accelerated competency form v1.0 June 2020 Page 1

5.4 NVFR SYLLABUS

NVFR Rating – Single Engine Aeroplane Night VFR Endorsement

FLIGHT TRAINING AND THEORY EXAMINATION SUMMARY

LESSON #	LESSON DESCRIPTION	DUAL (Day)	DUAL (Night)	SOLO (Night)	PROG Night	IF	PROG IF	TOTAL PROG FLIGHT TIME
NVFR(A)1	Basic Instrument Flight	1.0				0.7	0.7	1.0
NVFR(A)2	Navigation Aid Training	1.0				0.7	1.4	2.0
NVFR(A)3	Circuits		1.0		1.0			3.0
NVFR(A)4	Circuits		1.0		2.0			4.0
NVFR(A)5	Circuits			1.0	3.0			5.0
NVFR(A)6	Navigation Exercise 1		2.0		5.0	0.2	1.6	7.0
NVFR(A)7	Navigation Exercise 2	#0.4	2.5		7.5	0.3	1.9	9.9
NVFR(A) Aeronautical Knowledge examination								
NVFR(A)8	Navex 3 - Pre-licence	#0.4	2.5		10.0	0.3	2.2	12.8
NVFR(A) flight test			**2.5**		12.5	**0.3**	**2.5**	**15.3**

Day component to assess IFF.3 & IFL.3, Recover from upset situations and unusual attitudes

NVFR(A) Summary v1.2 October 2016 Page 1

NVFR Rating – Single Engine Aeroplane Night VFR Endorsement

SYLLABUS INTRODUCTION

Overview

This syllabus describes the flight training and assessment activities to be undertaken during the night VFR rating – single engine aeroplane night VFR endorsement training course. The aim of the course is to provide the student with the required skills, knowledge and attitudes to safely exercise the privileges of the rating and endorsement.

Flight training lessons include a basic instrument flight and navigation aid training component conducted by day, followed by circuits and navigation exercises at night, procedures in the event of abnormal situations and human factors and non-technical skills awareness and application.

The privileges and limitations of the night VFR rating and single engine aeroplane night VFR endorsement are defined in CASR Part 61 Subpart 61.O.

Competency Standards

Practical flight competency standards

Flight training is provided to allow the student to meet the prescribed Part 61 MOS practical flight competency standards. Student performance is assessed against these flight competency standards. The standards required for the completion of this course and the issue of the rating and endorsement are captured by the following units of competency:

Unit code	Unit of competency
NTS1	Non-technical skills 1
NTS2	Non-technical skills 2
IFF	Full instrument panel manoeuvres
IFL	Limited instrument panel manoeuvres
NVR1	Conduct a traffic pattern at night
NVR2	Night VFR – single-engine aircraft

Aeronautical knowledge standards

The knowledge required to meet the aeronautical knowledge standards prescribed by the Part 61 MOS may be attained through student self-study or more formal training. Theory topics and content are described in the following unit of knowledge:

Unit code	Unit of knowledge
NVFR	NVFR rating – all aircraft categories

Course prerequisites

Students must hold a private, commercial or air transport pilot licence and aeroplane category rating. *(CASR 61.975)*

Course duration

The course may be undertaken on a part-time or full-time basis.

The syllabus is based on a total flight time of 15.3 hours inclusive of the NVFR (A) flight test; however the total flight time required to achieve competency will vary from student to student.

NVFR Rating – Single Engine Aeroplane Night VFR Endorsement

SYLLABUS INTRODUCTION

Course resources

Flight training can be undertaken in the C150 / C152 / C172RG / VansRV10.

Other resources include a model aeroplane, cockpit cut-out, instrument flight hood or foggles, navigation charts and navigation equipment.

Syllabus documentation

Syllabus documentation includes:

- a planning matrix
- a flight training and theory examination summary
- a lesson plan and training record for each flight.

Refer to Part 5A/Section 5.1* of the operations manual for a guide to the use of the syllabus documents.

Lesson sequence and allowable variations

The flight training and theory examination summary provides the sequence of flight training lessons.

If required (e.g. if weather conditions are not suitable for successful lesson outcomes), adjustments may be made to the lesson sequence as follows:

- Lesson NVFR (A) 2 navigation aid training may be conducted at any stage prior to NVFR (A) 6 navigation exercise 1.

Any variations to the lesson sequence which are not noted above are only to be made with the prior approval of the HOO or authorising instructor.

Solo flight

The course includes a minimum of 1 hour solo flight time in the circuit.

Prior to authorising a student to conduct a solo flight, instructors must ensure the requirements of section 3B1.1/3.4.1.1* are met.

Instructor requirements

Instructors must hold a night VFR rating training endorsement (aeroplane).

NVFR Rating – Single Engine Aeroplane Night VFR Endorsement

SYLLABUS INTRODUCTION

Aeronautical knowledge examination

Successful completion of the following examination is required during the course:

Prior to flight test - NVFR (A) aeronautical knowledge examination

This examination has been set by Advanced aviation training in accordance with the aeronautical knowledge standards mentioned in the Part 61 MOS, as a means for students to demonstrate they hold the required knowledge. The pass mark is 70%.

The flight training and theory examination summary sets out the recommended sequence for aeronautical knowledge examination and flight lessons. To avoid training delays, instructors should ensure students complete the examination in this sequence.

Aeronautical knowledge examinations are conducted in the ground examination facility. Refer to Part 3E/Section 3.7* for further information regarding the conduct of these exams.

Knowledge Deficiency Reports

If a student passes the NVFR (A) aeronautical knowledge examination with a score of less than 100%, a report shall be prepared about the competency standards in which the student's knowledge is deficient (a knowledge deficiency report). Following further self-study, an instructor holding a grade 1 or 2 training endorsement must orally assess the student's knowledge to ensure the deficiencies noted on the knowledge deficiency report have been addressed (i.e. knowledge corrected to 100%).

Flight test

Upon successful completion of the course students must pass the night VFR rating - aeroplane flight test, prior to the rating being issued.

The test is conducted by a flight examiner and involves a ground component and a flight of approximately 2.5 hours.

Flight test standards are contained in Schedule 5 App 0.1 to the Part 61 MOS. Manoeuvres must be performed within the flight tolerances specified in table 1, Section 1 of Schedule 8 of the MOS.

For flight test procedures and information regarding the booking of flight tests, refer to section 3F1/3.8.1*.

Document control and access information

This syllabus is a managed document and is uncontrolled if printed. Refer to the version number and date in the footer to ensure that the current syllabus is being referenced.

It is available in electronic format. Paper copies are also provided for use by instructors and students.

Syllabus documentation is to be read in conjunction with Advanced aviation training's operations manual, CASR Parts 61, 141 and the Part 61 Manual of Standards.

*MAAT manual reference

Planning Matrix **Night VFR Rating – single-engine aeroplane night VFR endorsement v1.2**

Legend

S = Solo

Performance Standards

3 = Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue.
2 = Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision*.
1 = Achieves competency to the standard required for qualification issue.

Solo operations for authorised sequences only

		1 Basic Instrument Flight (day)	2 Navaid Training (day)	3 Circuits	4 Circuits	5 Circuits - solo	6 Navigation Exercise 1	7 Navigation Exercise 2	8 Navex #3 - Pre-licence	9 Flight Test	Total hours
	Dual day	1.0	1.0					0.4	0.4		2.8
	Dual night			1.0	1.0		2.0	2.5	2.5	2.5	11.5
	Solo night					1.0					1.0
	Instrument flight time	0.7	0.7				0.2	0.3	0.3	0.3	(2.5 IF)
	Training phases										**15.3**
	Aeronautical knowledge examinations	Night VFR(A) aeronautical knowledge examination									
Units, Elements and Performance Criteria											
NVR1	**Conduct a traffic pattern at night**										
NVR1.1	**Control aircraft on the ground at night**										
(a)	instrument and cockpit lighting are adjusted to an appropriate level for taxiing			2	2	S		1	1		
(b)	ATC instructions and manoeuvres of the aircraft on the ground at night within the approved movement area as defined by aerodrome ground lighting are complied with			2	2	S		1	1		
(c)	aircraft lighting to identify obstructions, other aircraft and taxiway and runway limits is used as required			2	2	S		1	1		
(d)	aircraft is taxied at a speed which allows for an adequate lookout to be maintained to avoid obstructions			2	2	S		1	1		
NVR1.2	**Activate pilot activated lighting (PAL)**										
(a)	appropriate radiotelephone frequency is utilised to activate PAL system when within radio range			2	2	S		1	1		
(b)	transmit sequence is utilised to activate PAL system			2	2	S		1	1		
(c)	wind indicator lighting is monitored to determine end of activation period			2	2	S		1	1		
NVR1.3	**Take-off aircraft at night**										
(a)	aircraft is lined up correctly in centre of runway in take-off direction			2	2	S		1	1		
(b)	line-up checks appropriate to night take-off are completed			2	2	S		1	1		
(c)	take-off by reference to flare path and runway lighting and aircraft instruments is executed			2	2	S		1	1		
(d)	aircraft is rotated at manufacturer's recommended speed			2	2	S		1	1		
(e)	climb attitude and control aircraft in climb, after take-off solely by reference to instruments is completed			2	2	S		1	1		
(f)	alignment with runway by visual reference and lookout is established and maintained			2	2	S		1	1		
(g)	after take-off, checks are performed at a safe height			2	2	S		1	1		
NVR1.4	**Fly a circuit pattern at night**										
	perform a circuit pattern safely and in accordance with the specified procedures and approved techniques			2	2	S		1	1		
NVR1.5	**Manage emergency situations at night**										
(a)	(in simulated conditions) aircraft control is maintained			2	2			1	1		
(b)	emergency situation is managed in accordance published procedures			2	2			1	1		
(c)	electrical lighting and power sources are monitored			2	2			1	1		
(d)	electrical lighting and power source emergency procedures are conducted as appropriate			2	2			1	1		
NVR1.6	**Perform a go-around**										
(a)	the need to conduct a go-around is recognised			2	2	S		1	1		
(b)	go-around is performed from any point on base and final approach legs			2	2	S		1	1		
NVR1.7	**Land at night, with and without the use of aircraft landing lights**										
(a)	circuit entry and pattern are performed with reference to runway environment			2	2	S		1	1		
(b)	safe altitude is maintained by reference to aircraft instruments and runway lighting			2	2	S		1	1		
(c)	aircraft is safely landed at night with and without landing lights			2	2	S		1	1		
(d)	after landing checks are performed			2	2	S		1	1		
NVR2	**Night VFR – single-engine aircraft**										
NVR2.1	**Determine aircraft meets requirements for NVFR flight**										
(a)	aircraft requirements for NVFR flight are determined	3		2	2	S		1	1		
(b)	flight and navigation instruments, minimum electrical lighting and navigation equipment and any other requirements which are fitted to the aircraft are checked to ensure they are suitable and serviceable for NVFR flight	3		2	2	S		1	1		
NVR2.2	**Obtain and use current operational documents**										
(a)	operational documents applicable to the flight are obtained and checked for currency						2	1	1		
(b)	applicable information contained in documents for flight planning and management is interpreted and applied						2	1	1		
(c)	documents required for the flight are stowed and accessibility for the pilot during flight is ensured						2	1	1		
NVR2.3	**Prepare flight plan for NVFR flight**										
(a)	charts suitable for intended NVFR flight are selected and prepared						2	1	1		
(b)	applicable information to prepare a flight plan which details tracks, distances, times, altitudes to be flown and fuel requirements to reach destination are obtained, analysed and applied						2	1	1		
(c)	meteorological, airways facilities, aerodrome and NOTAM information applicable to planning and conducting a flight is obtained, interpreted and applied						2	1	1		
(d)	routes to optimise options in the event of an engine failure are planned						2	1	1		
NVR2.4	**Determine operational requirements**										
(a)	suitability of the aerodrome lighting for night operations is determined			2	2	S		1	1		
(b)	curfew requirements are complied with			2	2	S		1	1		
(c)	duration of flight is determined			2	2	S		1	1		
(d)	holding, alternate and reserve fuel requirements due to weather, navigation aid availability and aerodrome lighting are determined in accordance with operational requirements						2	1	1		
(e)	total fuel requirements are calculated			2	2	S		1	1		
NVR2.5	**Make flight notification**										
(a)	flight notification is prepared for planned NVFR flight						2	1	1		
(b)	completed flight notification is submitted						2	1	1		
(c)	flight notification acceptance is confirmed						2	1	1		
NVR2.6	**Program navigation system**										
(a)	prepare data for transfer to approved airborne navigation system		3				2	1	1		
(b)	navigation data is loaded and checked		3				2	1	1		

1

Planning Matrix   Night VFR Rating – single-engine aeroplane night VFR endorsement v1.2

Legend

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Solo operations for authorised sequences only

		1 Basic Instrument Flight (day)	2 Navaid Training (day)	3 Circuits	4 Circuits	5 Circuits - solo	6 Navigation Exercise 1	7 Navigation Exercise 2	8 Navex #3 - Pre-licence	9 Flight Test	Total hours
	Dual day	1.0	1.0					0.4	0.4		2.8
	Dual night			1.0	1.0		2.0	2.5	2.5	2.5	11.5
	Solo night					1.0					1.0
	Instrument flight time	0.7	0.7				0.2	0.3	0.3	0.3	(2.5 IF)
	Training phases										**15.3**
	Aeronautical knowledge examinations	Night VFR(A) aeronautical knowledge examination									
NVR2.7	**Select, operate and monitor navigation aids and systems**										
(a)	appropriate navigation aids and systems for the planned NVFR flight are selected and operated in accordance navigation aid and system requirements		3				2	1	1		
(b)	integrity of navigation aid and systems information is monitored and maintained		3				2	1	1		
NVR2.8	**Make visual departure at night**										
(a)	obstacle clearance is ensured until reaching LSALT						2	1	1		
(b)	departure track is intercepted within 5 nm of aerodrome						2	1	1		
(c)	conduct take-off and departure from an aerodrome which is remote from ground lighting as follows:										
	(i) climb out after take-off, using instruments as the primary reference						2	1	1		
	(ii) after take-off checks are performed at a safe height						2	1	1		
NVR2.9	**Navigate the aircraft under NVFR**										
(a)	cockpit and instrument lighting are adjusted to allow reference to documentation, instruments and lookout						2	1	1		
(b)	manages and interprets outputs of on-board navigation systems		3				2	1	1		
(c)	aircraft position fix is determined visually or with reference to navigation aid and system		3				2	1	1		
(d)	updates navigation log						2	1	1		
(e)	maintains fuel log						2	1	1		
(f)	uses a recognised navigation work cycle						2	1	1		
(g)	tracks are intercepted to and from visually or with reference to navigation aids and systems		3				2	1	1		
(h)	track is maintained within tolerances specified in published procedures		3				2	1	1		
(i)	timings are recorded, assessed and revised as required						2	1	1		
(j)	station passage is recognised		3				2	1	1		
(k)	planned route above LSALT is maintained						2	1	1		
(l)	route and destination weather conditions are monitored and appropriate actions are executed						2	1	1		
(m)	descent point is calculated and amended						2	1	1		
NVR2.10	**Comply with air traffic control rules and procedures for NVFR flights**										
(a)	separation from other air traffic maintained			2	2	S		1	1		
(b)	airspace requirements are complied with			2	2	S		1	1		
(c)	two-way communication is maintained with ATS and other aircraft			2	2	S		1	1		
(d)	ATC clearances and radar vectoring instructions are complied with			2	2	S		1	1		
NVR2.11	**Manage hazardous weather conditions**										
(a)	hazardous weather conditions are identified and avoided						2	1	1		
(b)	procedures for avoidance of hazardous weather are demonstrated and explained						2	1	1		
(c)	aircraft systems are employed to mitigate the effects of hazardous weather						2	1	1		
NVR2.12	**Manage emergency situations at night**										
(a)	(in simulated conditions) aircraft control is maintained						2	1	1		
(b)	emergency situation is managed in accordance published procedures						2	1	1		
(c)	electrical lighting and power sources are monitored						2	1	1		
(d)	electrical lighting and power source emergency procedures are conducted as appropriate						2	1	1		
NVR2.13	**Conduct a diversion to revised route or alternate aerodrome at night**										
(a)	requirement for an unplanned diversion is recognised and confirmed						2	1	1		
(b)	route to alternate aerodrome, navigation aid and revised track is determined						2	1	1		
(c)	planned route maintains height above LSALT in accordance with regulations while flying under NVFR						2	1	1		
(d)	flight planned route is diverted to track to an alternate aerodrome, navigation aid or aerodrome						2	1	1		
(e)	operational information for alternate aerodrome(s) is reviewed and applied according to published procedures						2	1	1		
(f)	fuel plan is reviewed and amended according to published procedures						2	1	1		
NVR2.14	**Make visual approach at night**										
(a)	descent below LSALT is conducted in accordance with published procedures;						2	1	1		
(b)	track is maintained to destination aerodrome						2	1	1		
(c)	conduct an approach and landing at an aerodrome that is remote from extensive ground lighting						2	1	1		
NVR2.15	**Perform a go-around**										
(a)	the need to conduct a go-around is recognised						2	1	1		
(b)	go-around is performed from any point on base and final approach legs						2	1	1		
IFF	**Full instrument panel manoeuvres**										
IFF.1	**Determine and monitor the serviceability of flight instruments and instrument power sources**										
(a)	determine serviceability of flight and navigational instruments	2	2				2	1	1		
(b)	perform functional checks of flight and navigational instruments where applicable prior to take-off	2	2				2	1	1		
(c)	monitor flight instrument and instrument power sources and react to any warnings, unserviceability or erroneous indications	2	2				2	1	1		
IFF.2	**Perform manoeuvres using full instrument panel**										
(a)	interpret flight instrument indications and apply procedures and techniques to achieve and maintain a specified flight path using the aircraft's full instrument panel	2	2				2	1	1		
(b)	set and maintain power and attitude by reference to the full instrument panel to achieve the following:										
	(i) straight and level performance during normal cruise within the flight tolerances	2	2				2	1	1		
	(ii) nominated climb performance within the flight tolerances	2	2				2	1	1		
	(iii) descent performance within the flight tolerances	2	2				2	1	1		
(c)	set and maintain power and attitude by reference to the full instrument panel to establish a rate 1 turn onto a nominated heading within the flight tolerances	2	2				2	1	1		

2

Planning Matrix Night VFR Rating – single-engine aeroplane night VFR endorsement v1.2

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Solo operations for authorised sequences only

		1	2	3	4	5	6	7	8	9	
		Basic Instrument Flight (day)	Navaid Training (day)	Circuits	Circuits	Circuits - solo	Navigation Exercise 1	Navigation Exercise 2	Navex #3 - Pre-licence	Flight Test	**Total hours**
	Dual day	1.0	1.0					0.4	0.4		2.8
	Dual night			1.0	1.0		2.0	2.5	2.5	2.5	11.5
	Solo night					1.0					1.0
	Instrument flight time	0.7	0.7				0.2	0.3	0.3	0.3	(2.5 IF)
	Training phases										**15.3**
	Aeronautical knowledge examinations	Night VFR(A) aeronautical knowledge examination									
IFF.3	**Recover from upset situations and unusual attitudes**										
(a)	correctly identify upset situations and unusual attitudes under simulated IMC	2	2					1*	1*		
(b)	recover to controlled flight from upset situations and unusual attitudes under simulated IMC from any combination of the following aircraft states:										
	(i) high and low-nose attitudes	2	2					1*	1*		
	(ii) varying angles of bank	2	2					1*	1*		
	(iii) various power settings	2	2					1*	1*		
	(iv) various aircraft configurations	2	2					1*	1*		
	(v) unbalanced flight	2	2					1*	1*		
IFL	**Limited instrument panel manoeuvres**										
IFL.1	**Recognise failure of attitude indicator and stabilised heading indicator**										
(a)	monitor flight instruments and instrument power sources and recognise warning indicators or erroneous instrument indications	2	2				2	1	1		
(b)	transition from a full instrument panel to a limited instrument panel	3	3				2	1	1		
IFL.2	**Perform manoeuvres – limited panel**										
(a)	interpret and respond appropriately to instrument indications	3	3					1	1		
(b)	apply power and attitude settings to achieve straight and level performance during:										
	(i) normal cruise	3	3				2	1	1		
	(ii) approach configuration with flaps (when fitted) and undercarriage down	3	3					1	1		
(c)	apply power and attitude settings to achieve:										
	(i) nominated climb performance;	3	3					1	1		
	(ii) nominated descent performance	3	3					1	1		
	(iii) during climb, descent and straight and level flight, rate 1 turns onto a nominated heading	3	3					1	1		
(d)	trim (as applicable) and balance aircraft	3	3				2	1	1		
(e)	establish level flight at a nominated altitude, from a climb or descent during straight or turning flight	3	3					1	1		
IFL.3	**Recover from upset situations and unusual attitudes – limited panel**										
(a)	correctly identify upset situations and unusual attitudes under simulated IMC	3	3					1*	1*		
(b)	recover to stabilised straight and level flight using approved techniques from upset situations and unusual attitudes under simulated IMC from any combination of the following aircraft states:										
	(i) high and low-nose attitudes	3	3					1*	1*		
	(ii) varying angles of bank	3	3					1*	1*		
	(iii) various power settings	3	3					1*	1*		
	(iv) various aircraft configurations	3	3					1*	1*		
	(v) unbalanced flight	3	3					1*	1*		
IFL.4	**Re-establish visual flight**										
(a)	transition from visual flight conditions to instrument flight conditions while maintaining control of the aircraft	3	3					1	1		
(b)	perform a manoeuvre to re-establish visual flight	3	3					1	1		
(c)	implement a plan that ensures the flight continues in VMC	3	3					1	1		
NTS1	**Non-technical skills 1**										
NTS1.1	**Maintain effective lookout**										
(a)	maintain traffic separation using a systematic visual scan technique at a rate determined by traffic density, visibility and terrain			2	2			1	1		
(b)	maintain radio listening watch and interpret transmissions to determine traffic location and intentions			2	2			1	1		
(c)	perform airspace-cleared procedure before commencing any manoeuvre			2	2			1	1		
NTS1.2	**Maintain situational awareness**										
(a)	monitor all aircraft systems using a systematic scan technique	2			2			1	1		
(b)	collect information to facilitate ongoing system management	2			2			1	1		
(c)	monitor flight environment for deviations from planned operations	2			2			1	1		
(d)	collect flight environment information to update planned operations	2			2			1	1		
NTS1.3	**Assess situations and make decisions**										
(a)	identify problems	2			2			1	1		
(b)	analyse problems	2			2			1	1		
(c)	identify solutions	2			2			1	1		
(d)	assess solutions and risks	2			2			1	1		
(e)	decide on a course of action	2			2			1	1		
(f)	communicate plans of action (if appropriate)	2			2			1	1		
(g)	allocate tasks for action (if appropriate)	2			2			1	1		
(h)	take actions to achieve optimum outcomes for the operation	2			2			1	1		
(i)	monitor progress against plan	2			2			1	1		
(j)	re-evaluate plan to achieve optimum outcomes	2			2			1	1		
NTS1.4	**Set priorities and manage tasks**										
(a)	organise workload and priorities to ensure optimum outcome of the flight	2			2			1	1		
(b)	plan events and tasks to occur sequentially	2			2			1	1		
(c)	anticipate events and tasks to ensure sufficient opportunity for completion	2			2			1	1		
(d)	use technology to reduce workload and improve cognitive and manipulative activities	2			2			1	1		
NTS1.5	**Maintain effective communications and interpersonal relationships**										
(a)	establish and maintain effective and efficient communications and interpersonal relationships with all stakeholders to ensure the optimum outcome of the flight	2			2			1	1		

3

Planning Matrix — Night VFR Rating – single-engine aeroplane night VFR endorsement v1.2

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Solo operations for authorised sequences only

		1 Basic Instrument Flight (day)	2 Navaid Training (day)	3 Circuits	4 Circuits	5 Circuits - solo	6 Navigation Exercise 1	7 Navigation Exercise 2	8 Navex #3 - Pre-licence	9 Flight Test	Total hours
	Dual day	1.0	1.0					0.4	0.4		2.8
	Dual night			1.0	1.0		2.0	2.5	2.5	2.5	11.5
	Solo night					1.0					1.0
	Instrument flight time	0.7	0.7				0.2	0.3	0.3	0.3	(2.5 IF)
	Training phases										**15.3**
	Aeronautical knowledge examinations	Night VFR(A) aeronautical knowledge examination									
(b)	define and explain objectives to stakeholders	2			2			1	1		
(c)	demonstrate a level of assertiveness that ensures the optimum completion of the flight	2			2			1	1		
NTS2	**Non-technical skills 2**										
NTS2.1	**Recognise and manage threats**										
(a)	identify relevant environmental or operational threats that are likely to affect the safety of the flight	2			2			1	1		
(b)	identify when competing priorities and demands may represent a threat to the safety of the flight	2			2			1	1		
(c)	develop and implement countermeasures to manage threats	2			2			1	1		
(d)	monitor and assess flight progress to ensure a safe outcome, or modify actions when a safe outcome is not assured	2			2			1	1		
NTS2.2	**Recognise and manage errors**										
(a)	apply checklists and standard operating procedures to prevent aircraft handling, procedural or communication errors	2			2			1	1		
(b)	identify committed errors before safety is affected or the aircraft enters an undesired state	2			2			1	1		
(c)	monitor the following to collect and analyse information to identify potential or actual errors:										
	(i) aircraft systems using a systematic scan technique	2			2			1	1		
	(ii) the flight environment	2			2			1	1		
	(iii) other crew	2			2			1	1		
(d)	implement countermeasures to prevent errors or take action in the time available to correct errors before the aircraft enters an undesired state	2			2			1	1		
NTS2.3	**Recognise and manage undesired aircraft state**										
(a)	recognise an undesired aircraft state	2			2			1	1		
(b)	prioritise tasks to ensure an undesired aircraft state is managed effectively	2			2			1	1		
(c)	apply corrective actions to recover an undesired aircraft state in a safe and timely manner	2			2			1	1		

*** Assessment conducted in VMC by day**

4

NVFR Rating – Single Engine Aeroplane Night VFR Endorsement

LESSON PLAN AND TRAINING RECORD
NVFR(A) 1: BASIC INSTRUMENT FLIGHT

Flight no:	NVFR(A)1.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Day VFR flight
- Introduction to NVFR aircraft and instrument requirements
- Basic instrument flight (manoeuvres using full and limited panel, upset situation and unusual attitude recoveries)
- Limited instrument panel is to be simulated in each of the following non-normal situations:
  - without reference to the primary attitude indicator or display
  - without reference to the primary heading indicator or display
  - without reference to reliable airspeed indications.

PRE-FLIGHT KNOWLEDGE
Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Long briefing – Basic Instrument Flight
- Instrument flight - revision using full instrument panel and introduction to limited panel
- Instrument serviceability checks
- Sensory illusions
- Scan technique
- Control and performance instruments
- Instrument lag
- Compass errors
- Calculation of rate 1 turns
- Importance of proper planning & preparation to avoid inadvertent entry into IMC
- Actions upon inadvertent entry into IMC
- Unusual attitudes – instrument indications, recovery techniques (both full and limited panel situations)
- Introduction to flight and navigation instrumentation and minimum electrical lighting required for NVFR flight

LESSON PLAN AND TRAINING RECORD
NVFR(A) 1: BASIC INSTRUMENT FLIGHT

PRE-FLIGHT KNOWLEDGE
Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Underpinning knowledge
- Scan technique appropriate to fitted flight instruments and phase of flight [IFF 4(a)]
- Attitude and power requirements to achieve specified flight profiles [IFF 4(b)]
- Instrument failure and warning systems fitted to the aeroplane [IFF 4(c)]
- Scan technique appropriate to fitted flight instruments and phase of flight (without attitude or stabilised heading indicators) [IFL 4(a)]
- Performance instrument indications and power requirements to achieve specified flight profiles [IFL 4(b)]
- Anti-icing and de-icing controls and switches fitted to the aircraft type, and when these systems should be operated [IFL 4(c)]
- Instrument failure and warning systems fitted to the aircraft [IFL 4 (d)]
- The safety risks associated with application of large or rapid control inputs in more than 1 axis simultaneously [IFL 4(e)]
- Pre and post flight administration

HF & NTS
- Vestibular systems, namely the semicircular canals and otoliths, in helping the pilot to maintain orientation [NVFR1 4(i)]
- Circumstances which aggravate vestibular disorientation, and how to overcome this problem [NVFR1 4(j)]
- Causes that may aggravate vestibular disorientation, such as somatogravic illusions, somatogyral illusions and 'graveyard spiral', coriolis effect, and 'leans' [NVFR1 4(k)]
- Effective communication under normal and non-normal circumstances [NTS1 & NTS2 4(a)]
- Task management [NTS1 4(b)]
- Threat and error management detailing processes that can be used to identify and mitigate or control threats and errors [NTS2 4(b)]
- The application of situational awareness to identifying real or potential environmental or operational threats to flight safety [NTS2 4(c)]
- Developing and implementing plans of action for the following:
- removing and mitigating threats
- removing and mitigating errors [NTS2 4(d)]
- Undesired aircraft states including prevention, identifying and controlling [NTS2 4(e)]
- How an undesired aircraft state can develop from an unmanaged threat or error [NTS2 4(f)]
- Hand over/take over technique (e.g. 'I have control – you have control')
- Control technique

Pre-flight briefing
- Review flight sequences, what to expect, see & do
- Check essential knowledge
- Reinforce threat & error management
- Reinforce significant airmanship points

Pre-flight knowledge components complete:	**Instructor's signature & date**

LESSON PLAN AND TRAINING RECORD
NVFR(A) 1: BASIC INSTRUMENT FLIGHT

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual (0.7 IF)

MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
NVR2.1	**Determine aircraft meets requirements for NVFR flight**		
(a)	aircraft requirements for NVFR flight are determined	3	
(b)	flight and navigation instruments, minimum electrical lighting and navigation equipment and any other requirements which are fitted to the aircraft are checked to ensure they are suitable and serviceable for NVFR flight	3	
IFF.1	**Determine and monitor the serviceability of flight instruments and instrument power sources**		
(a)	determine serviceability of flight and navigational instruments	2	
(b)	perform functional checks of flight and navigational instruments where applicable prior to take-off	2	
(c)	monitor flight instrument and instrument power sources and react to any warnings, unserviceability or erroneous indications	2	
IFF.2	**Perform manoeuvres using full instrument panel**		
(a)	interpret flight instrument indications and apply procedures and techniques to achieve and maintain a specified flight path using the aircraft's full instrument panel	2	
(b)	set and maintain power and attitude by reference to the full instrument panel to achieve the following:		
	(i) straight and level performance during normal cruise within the flight tolerances	2	
	(ii) nominated climb performance within the flight tolerances	2	
	(iii) descent performance within the flight tolerances	2	
(c)	set and maintain power and attitude by reference to the full instrument panel to establish a rate 1 turn onto a nominated heading within the flight tolerances	2	
IFF.3	**Recover from upset situations and unusual attitudes**		
(a)	correctly identify upset situations and unusual attitudes under simulated IMC	2	
(b)	recover to controlled flight from upset situations and unusual attitudes under simulated IMC from any combination of the following aircraft states:		
	(i) high and low-nose attitudes	2	
	(ii) varying angles of bank	2	
	(iii) various power settings	2	
	(iv) various aircraft configurations	2	
	(v) unbalanced flight	2	
IFL.1	**Recognise failure of attitude indicator and stabilised heading indicator**		
(a)	monitor flight instruments and instrument power sources and recognise warning indicators or erroneous instrument indications	2	
(b)	transition from a full instrument panel to a limited instrument panel	3	
IFL.2	**Perform manoeuvres – limited panel**		
(a)	interpret and respond appropriately to instrument indications	3	
(b)	apply power and attitude settings to achieve straight and level performance during:		

LESSON PLAN AND TRAINING RECORD
NVFR(A) 1: BASIC INSTRUMENT FLIGHT

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual (0.7 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved*
	(i) normal cruise	3	
	(ii) approach configuration with flaps (when fitted) and undercarriage down	3	
(c)	apply power and attitude settings to achieve:		
	(i) nominated climb performance	3	
	(ii) nominated descent performance	3	
	(iii) during climb, descent and straight and level flight, rate 1 turns onto a nominated heading	3	
(d)	trim (as applicable) and balance aircraft	3	
(e)	establish level flight at a nominated altitude, from a climb or descent during straight or turning flight	3	
IFL.3	**Recover from upset situations and unusual attitudes – limited panel**		
(a)	correctly identify upset situations and unusual attitudes under simulated IMC	3	
(b)	recover to stabilised straight and level flight using approved techniques from upset situations and unusual attitudes under simulated IMC from any combination of the following aircraft states:		
	(i) high and low-nose attitudes	3	
	(ii) varying angles of bank	3	
	(iii) various power settings	3	
	(iv) various aircraft configurations	3	
	(v) unbalanced flight	3	
IFL.4	**Re-establish visual flight**		
(a)	transition from visual flight conditions to instrument flight conditions while maintaining control of the aircraft	3	
(b)	perform a manoeuvre to re-establish visual flight	3	
(c)	implement a plan that ensures the flight continues in VMC	3	
NTS1.2	**Maintain situational awareness**		
(a)	monitor all aircraft systems using a systematic scan technique	2	
(b)	collect information to facilitate ongoing system management	2	
(c)	monitor flight environment for deviations from planned operations	2	
(d)	collect flight environment information to update planned operations	2	
NTS1.3	**Assess situations and make decisions**		
(a)	identify problems	2	
(b)	analyse problems	2	
(c)	identify solutions	2	
(d)	assess solutions and risks	2	
(e)	decide on a course of action	2	
(f)	communicate plans of action (if appropriate)	2	
(g)	allocate tasks for action (if appropriate)	2	
(h)	take actions to achieve optimum outcomes for the operation	2	
(i)	monitor progress against plan	2	
(j)	re-evaluate plan to achieve optimum outcomes	2	
NTS1.4	**Set priorities and manage tasks**		
(a)	organise workload and priorities to ensure optimum outcome of the flight	2	
(b)	plan events and tasks to occur sequentially	2	

LESSON PLAN AND TRAINING RECORD
NVFR(A) 1: BASIC INSTRUMENT FLIGHT

FLIGHT TRAINING Suggested flight time: 1.0 hour dual (0.7 IF)		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Required**	**Achieved***
(c)	anticipate events and tasks to ensure sufficient opportunity for completion	2	
(d)	use technology to reduce workload and improve cognitive and manipulative activities	2	
NTS1.5	**Maintain effective communications and interpersonal relationships**		
(a)	establish and maintain effective and efficient communications and interpersonal relationships with all stakeholders to ensure the optimum outcome of the flight	2	
(b)	define and explain objectives to stakeholders	2	
(c)	demonstrate a level of assertiveness that ensures the optimum completion of the flight	2	
NTS2.1	**Recognise and manage threats**		
(a)	identify relevant environmental or operational threats that are likely to affect the safety of the flight	2	
(b)	identify when competing priorities and demands may represent a threat to the safety of the flight	2	
(c)	develop and implement countermeasures to manage threats	2	
(d)	monitor and assess flight progress to ensure a safe outcome, or modify actions when a safe outcome is not assured	2	
NTS2.2	**Recognise and manage errors**		
(a)	apply checklists and standard operating procedures to prevent aircraft handling, procedural or communication errors	2	
(b)	identify committed errors before safety is affected or the aircraft enters an undesired state	2	
(c)	monitor the following to collect and analyse information to identify potential or actual errors:		
	(i) aircraft systems using a systematic scan technique	2	
	(ii) the flight environment	2	
	(iii) other crew	2	
(d)	implement countermeasures to prevent errors or take action in the time available to correct errors before the aircraft enters an undesired state	2	
NTS2.3	**Recognise and manage undesired aircraft state**		
(a)	recognise an undesired aircraft state	2	
(b)	prioritise tasks to ensure an undesired aircraft state is managed effectively	2	
(c)	apply corrective actions to recover an undesired aircraft state in a safe and timely manner	2	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

LESSON PLAN AND TRAINING RECORD
NVFR(A) 1: BASIC INSTRUMENT FLIGHT

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

	NVFR Rating – Single Engine Aeroplane Night VFR Endorsement

LESSON PLAN AND TRAINING RECORD
NVFR(A) 2: NAVIGATION AID TRAINING

Flight no:	NVFR(A)2.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Flight during daylight hours
- Navigation aid training
- Revise instrument flight

PRE-FLIGHT KNOWLEDGE
Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Long briefing – Navigation aid training
- Radio wave propagation and limitations
- Navigation aids to be used, individual errors and limitations
- Aeroplane antennas
- Testing of navigation aids (tune, identify, test)
- Monitoring of navigation aid integrity
- Orientation
- Homing
- Tracking
- Intercepting track – inbound and outbound

Underpinning knowledge
- Review/expand previously introduced knowledge as appropriate
- The requirements for
  - positive radio fixing
  - the most precise track guidance [NVR2 4(d)]

HF & NTS
- The application of situational awareness to identifying real or potential environmental or operational threats to flight safety [NTS2 4(c)]
- Use of checklists and standard operating procedures to prevent errors [NTS2 4(h)]

Pre-flight briefing
- Review flight sequences, what to expect, see & do
- Check essential knowledge
- Reinforce threat & error management
- Reinforce significant airmanship points

Pre-flight knowledge components complete:	**Instructor's signature & date**

LESSON PLAN AND TRAINING RECORD
NVFR(A) 2: NAVIGATION AID TRAINING

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual (0.7 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
NVR2.6	**Program navigation system**		
(a)	prepare data for transfer to approved airborne navigation system	3	
(b)	navigation data is loaded and checked	3	
NVR2.7	**Select, operate and monitor navigation aids and systems**		
(a)	appropriate navigation aids and systems for the planned NVFR flight are selected and operated in accordance navigation aid and system requirements	3	
(b)	integrity of navigation aid and systems information is monitored and maintained	3	
NVR2.9	**Navigate the aircraft under NVFR** *(introduction to procedures during day operations)*		
(b)	manages and interprets outputs of on-board navigation systems	3	
(c)	aircraft position fix is determined visually or with reference to navigation aid and system	3	
(g)	tracks are intercepted to and from visually or with reference to navigation aids and systems	3	
(h)	track is maintained within tolerances specified in published procedures	3	
(j)	station passage is recognised	3	
IFF.1	**Determine and monitor the serviceability of flight instruments and instrument power sources**	2	
IFF.2	**Perform manoeuvres using full instrument panel**	2	
IFF.3	**Recover from upset situations and unusual attitudes**	2	
IFL.1	**Recognise failure of attitude indicator and stabilised heading indicator**	2	
IFL.2	**Perform manoeuvres – limited panel**	2	
IFL.3	**Recover from upset situations and unusual attitudes – limited panel**	2	
IFL.4	**Re-establish visual flight**	2	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

LESSON PLAN AND TRAINING RECORD
NVFR(A) 2: NAVIGATION AID TRAINING

CONSOLIDATION AND/OR REMEDIAL TRAINING			
		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

NVFR Rating – Single Engine Aeroplane Night VFR Endorsement

LESSON PLAN AND TRAINING RECORD
NVFR(A) 3: NIGHT CIRCUITS

Flight no:	NVFR(A)3.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Introduction to night operations
- Night circuits

PRE-FLIGHT KNOWLEDGE **Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour** **Underpinning knowledge: as required**
Content
Long briefing – Introduction to Night Flying, Night Circuits • Physiological effects • Sensory illusions • Limitations of sight • Instrumentation and aeroplane lighting requirements • Aerodrome lighting requirements • Pilot activated lighting (PAL) • Technique for aeroplane control immediately following take-off to safe height • Circuit procedures • Approach judgement • Judgement of round out height • Lighting failure

LESSON PLAN AND TRAINING RECORD
NVFR(A) 3: NIGHT CIRCUITS

PRE-FLIGHT KNOWLEDGE **Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour** **Underpinning knowledge: as required**	
Content	
Underpinning knowledge • Review/expand previously introduced knowledge as appropriate • The colour and pattern of the following [NVR1 4(b)]: − permanent threshold light − runway threshold identification lights − displaced threshold lighting − runway edge lighting − runway end lighting − runway centreline lighting − obstacle lighting • Method of activating pilot-activated aerodrome lighting (PAL) [NVR1 4(c)] • Method of activating Aerodrome Frequency Response Unit (AFRU) with Pilot Activated Aerodrome Lighting (PAL) options [NVR1 4(d)] • The time that PAL remains illuminated [NVR1 4(e)] • PAL warning for users that the lights are about to extinguish [NVR1 4(f)] • Operation and use of a Visual Approach Slope Indicator (VASI) system [NVR1 4(g)] • Operation and use of a Precision Approach Path Indicator (PAPI) system [NVR1 4(h)] • Conditions and causes under which visual illusions, such as 'false horizons', visual-cue illusions, relative motion illusions, 'flicker effect', 'black hole' illusion, and autokinesis may occur [NVR1 4(l)]	
HF & NTS • Effective communication under normal and non-normal circumstances [NTS1 4(a)] • Task management [NTS1 4(b)]	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

LESSON PLAN AND TRAINING RECORD
NVFR(A) 3: NIGHT CIRCUITS

FLIGHT TRAINING Suggested flight time: 1.0 hour dual (Night)			
MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
NVR1.1	**Control aircraft on the ground at night**		
(a)	instrument and cockpit lighting are adjusted to an appropriate level for taxiing	2	
(b)	ATC instructions and manoeuvres of the aircraft on the ground at night within the approved movement area as defined by aerodrome ground lighting are complied with	2	
(c)	aircraft lighting to identify obstructions, other aircraft and taxiway and runway limits is used as required	2	
(d)	aircraft is taxied at a speed which allows for an adequate lookout to be maintained to avoid obstructions	2	
NVR1.2	**Activate pilot activated lighting (PAL)**		
(a)	appropriate radiotelephone frequency is utilised to activate PAL system when within radio range	2	
(b)	transmit sequence is utilised to activate PAL system	2	
(c)	wind indicator lighting is monitored to determine end of activation period	2	
NVR1.3	**Take-off aircraft at night**		
(a)	aircraft is lined up correctly in centre of runway in take-off direction	2	
(b)	line-up checks appropriate to night take-off are completed	2	
(c)	take-off by reference to flare path and runway lighting and aircraft instruments is executed	2	
(d)	aircraft is rotated at manufacturer's recommended speed	2	
(e)	climb attitude and control aircraft in climb, after take-off solely by reference to instruments is completed	2	
(f)	alignment with runway by visual reference and lookout is established and maintained	2	
(g)	after take-off, checks are performed at a safe height	2	
NVR1.4	**Fly a circuit pattern at night**		
	perform a circuit pattern safely and in accordance with the specified procedures and approved techniques	2	
NVR1.5	**Manage emergency situations at night** *(simulated conditions – e.g. lighting failure, electrical failure)*		
(a)	(in simulated conditions) aircraft control is maintained	2	
(b)	emergency situation is managed in accordance published procedures	2	
(c)	electrical lighting and power sources are monitored	2	
(d)	electrical lighting and power source emergency procedures are conducted as appropriate	2	
NVR1.6	**Perform a go-around**		
(a)	the need to conduct a go-around is recognised;	2	
(b)	go-around is performed from any point on base and final approach legs	2	
NVR1.7	**Land at night, with and without the use of aircraft landing lights**		
(a)	circuit entry and pattern are performed with reference to runway environment	2	
(b)	safe altitude is maintained by reference to aircraft instruments and runway lighting	2	
(c)	aircraft is safely landed at night with and without landing lights	2	
(d)	after landing checks are performed	2	
NVR2.1	**Determine aircraft meets requirements for NVFR flight**		
(a)	aircraft requirements for NVFR flight are determined	2	
(b)	flight and navigation instruments, minimum electrical lighting and navigation equipment and any other requirements which are fitted to the aircraft are checked to ensure they are suitable and serviceable for NVFR flight	2	
NVR2.4	**Determine operational requirements**		
(a)	suitability of the aerodrome lighting for night operations is determined	2	

LESSON PLAN AND TRAINING RECORD
NVFR(A) 3: NIGHT CIRCUITS

FLIGHT TRAINING Suggested flight time: 1.0 hour dual (Night)			
MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	 Achieved*
(b)	curfew requirements are complied with	2	
(c)	duration of flight is determined	2	
(d)	total fuel requirements are calculated	2	
NVR2.10	**Comply with air traffic control rules and procedures for NVFR flights**		
(a)	separation from other air traffic maintained	2	
(b)	airspace requirements are complied with	2	
(c)	two-way communication is maintained with ATS and other aircraft	2	
(d)	ATC clearances and radar vectoring instructions are complied with	2	
NTS1.1	**Maintain effective lookout**		
(a)	maintain traffic separation using a systematic visual scan technique at a rate determined by traffic density, visibility and terrain	2	
(b)	maintain radio listening watch and interpret transmissions to determine traffic location and intentions	2	
(c)	perform airspace-cleared procedure before commencing any manoeuvre	2	

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Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING			
MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	 Achieved

LESSON PLAN AND TRAINING RECORD
NVFR(A) 3: NIGHT CIRCUITS

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

	NVFR Rating – Single Engine Aeroplane Night VFR Endorsement

LESSON PLAN AND TRAINING RECORD
NVFR(A) 4: NIGHT CIRCUITS

Flight no:	NVFR(A)4.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Night circuits
- Assessment of competency to conduct first solo flight at night

PRE-FLIGHT KNOWLEDGE **Long Briefing: as required Pre-flight Briefing: 0.3 hour** **Underpinning knowledge: as required**	
Content	
Long briefing – revision as required • Preparation for first solo flight at night	
Underpinning knowledge • Review/expand previously introduced knowledge as appropriate • Assess knowledge required for first solo flight at night	
HF & NTS • Revise as required	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

LESSON PLAN AND TRAINING RECORD
NVFR(A) 4: NIGHT CIRCUITS

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual (Night)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
NVR1.1	Control aircraft on the ground at night	2	
NVR1.2	Activate pilot activated lighting (PAL)	2	
NVR1.3	Take-off aircraft at night	2	
NVR1.4	Fly a circuit pattern at night	2	
NVR1.5	Manage emergency situations at night	2	
NVR1.6	Perform a go-around	2	
NVR1.7	Land at night, with and without the use of aircraft landing lights	2	
NVR2.1	Determine aircraft meets requirements for NVFR flight	2	
NVR2.4	Determine operational requirements	2	
NVR2.10	Comply with air traffic control rules and procedures for NVFR flights	2	
NTS1.1	Maintain effective lookout	2	
NTS1.2	Maintain situational awareness	2	
NTS1.3	Assess situations and make decisions	2	
NTS1.4	Set priorities and manage tasks	2	
NTS1.5	Maintain effective communications and interpersonal relationships	2	
NTS2.1	Recognise and manage threats	2	
NTS2.2	Recognise and manage errors	2	
NTS2.3	Recognise and manage undesired aircraft state	2	

***Enter the performance standard achieved if it is different to that required**
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved

LESSON PLAN AND TRAINING RECORD
NVFR(A) 4: NIGHT CIRCUITS

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to first night solo flight?#	**Yes**	**No**

 # The trainee must be assessed as capable of conducting the first night solo flight safely. A minimum of performance standard 2 must have been achieved by the trainee in each of the assessments outlined in this syllabus (lessons NVFR(A)1-4). The requirements of CASR Parts 61 and 141 must also be met.

Instructor's signature & date	**Trainee's signature & date**

NVFR Rating – Single Engine Aeroplane Night VFR Endorsement

LESSON PLAN AND TRAINING RECORD
NVFR(A) 5: NIGHT CIRCUITS - SOLO

Flight no:	NVFR(A)5	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Solo circuits in accordance with the limitations and guidelines advised by the authorising flight instructor
- **Suggested flight time: 1.0 hour**

Operational Limitations:

Note: Except in emergency or urgency situations, or in the interests of maintaining safety, the trainee must not operate contrary to the authorisation specified by the instructor

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

NVFR Rating – Single Engine Aeroplane Night VFR Endorsement

LESSON PLAN AND TRAINING RECORD
NVFR(A) 6: NIGHT NAVIGATION EXERCISE #1

Flight no:	NVFR(A)6.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Night navigation route: YRED – YBSU – YMYB – YKRY - YRED
- Circuits and full stop landing at YMYB
- Revise instrument flight
- Diversion

PRE-FLIGHT KNOWLEDGE
Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Long briefing – Night Navigation
- LSALT calculations
- Weather considerations
- Aerodrome lighting and navigation aid requirements
- Flight plan and 'mud map' preparation
- Alternates – selection and planning
- Inadvertent entry into IMC
- 'Black hole' effect

LESSON PLAN AND TRAINING RECORD
NVFR(A) 6: NIGHT NAVIGATION EXERCISE #1

PRE-FLIGHT KNOWLEDGE
Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Underpinning knowledge [NVR2 4(a)-(q)]
- Navigation requirements for:
  - a night visual flight using radio navigation systems
  - a night visual flight using self-contained or long-range navigation systems
  - a night visual flight using visual reference to ground and water
- Navigation tolerance for a night visual flight avoiding CTA
- Requirements for:
  - positive radio fixing
  - the most precise track guidance
- Navigation requirements for night visual flight with respect to time interval between fixes, accuracy of time reference, and accuracy and procedures in track-keeping
- Procedures for night visual flight in all classes of airspace when diverting from track due to navigation or weather
- Route for night visual flight with respect to forecast weather, controlled airspace, prohibited, restricted and danger areas, specific route limitations, airways operational requirements and availability of published routes, enroute alternate aerodromes, navigation aids, rated coverage and radio communication
- Compulsory reporting points
- Route, aircraft equipment and navigation requirements for night VFR
- LSALT for a night visual flight for a route published on a chart
- Dimensions of the significant safety sector when calculating LSALT for a route not published on a chart
- Methods of calculating LSALT for a route not published on a chart
- Calculation of LSALT when uncertain of position
- Conditions for descent below LSALT
- Pre-flight altimeter accuracy check for a night visual flight
- Altimetry procedures to all stages of a night visual flight
- Operating at aerodromes where surrounding light is limited
- Part 61 MOS Schedule 3 Section 2.7:
  - the privileges and limitations of the rating
  - the minimum NVFR aircraft equipment requirements
  - aircraft landing area dimension and lighting requirements
  - the principles of operations, limitations and errors for the radio navigation systems used
  - the flight planning/notification requirements including lowest safe altitude (LSALT), weather, fuel and lighting
  - the requirements for departure and descent for clearance from terrain
  - the alternate aerodrome planning requirements
  - the operation of Pilot Activated Lighting (PAL)
  - the air traffic control (ATC) procedures relevant to NVFR operations

HF & NTS
- Part 61 MOS Schedule 3 Section 2.7:
  - the human factors and physiological limitations for the conduct of operations at night as described in CASA guidance material for NVFR operations
- Use of checklists and standard operating procedures to prevent errors [NTS2 4(h)]
- Task management including [NVR 4(i)]:
  - workload organisation and priority setting to ensure optimum safe outcome of the flight
  - event planning to occur in a logical and sequential manner
  - anticipating events to ensure sufficient opportunity is available for completion
  - using technology to reduce workload and improve cognitive and manipulative activities
  - task prioritisation and protection whilst filtering and managing real time information

LESSON PLAN AND TRAINING RECORD
NVFR(A) 6: NIGHT NAVIGATION EXERCISE #1

PRE-FLIGHT KNOWLEDGE **Long Briefing: 0.8 hour Pre-flight Briefing: 0.3 hour** **Underpinning knowledge: as required**	
Content	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
• Schedule Night VFR aeronautical knowledge examination	
Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 2.0 hours dual (night) (0.2 IF)

MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** Required	Achieved*
NVR2.2	**Obtain and use current operational documents**		
(a)	operational documents applicable to the flight are obtained and checked for currency	2	
(b)	applicable information contained in documents for flight planning and management is interpreted and applied	2	
(c)	documents required for the flight are stowed and accessibility for the pilot during flight is ensured	2	
NVR2.3	**Prepare flight plan for NVFR flight**		
(a)	charts suitable for intended NVFR flight are selected and prepared	2	
(b)	applicable information to prepare a flight plan which details tracks, distances, times, altitudes to be flown and fuel requirements to reach destination are obtained, analysed and applied	2	
(c)	meteorological, airways facilities, aerodrome and NOTAM information applicable to planning and conducting a flight is obtained, interpreted and applied	2	
(d)	routes to optimise options in the event of an engine failure are planned	2	
NVR2.4	**Determine operational requirements**		
(d)	holding, alternate and reserve fuel requirements due to weather, navigation aid availability and aerodrome lighting are determined in accordance with operational requirements	2	
NVR2.5	**Make flight notification**		
(a)	flight notification is prepared for planned NVFR flight	2	
(b)	completed flight notification is submitted	2	

LESSON PLAN AND TRAINING RECORD
NVFR(A) 6: NIGHT NAVIGATION EXERCISE #1

FLIGHT TRAINING
Suggested flight time: 2.0 hours dual (night) (0.2 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved*
(c)	flight notification acceptance is confirmed	2	
NVR2.6	**Program navigation system**		
(a)	prepare data for transfer to approved airborne navigation system	2	
(b)	navigation data is loaded and checked	2	
NVR2.7	**Select, operate and monitor navigation aids and systems**		
(a)	appropriate navigation aids and systems for the planned NVFR flight are selected and operated in accordance navigation aid and system requirements	2	
(b)	integrity of navigation aid and systems information is monitored and maintained	2	
NVR2.8	**Make visual departure at night**		
(a)	obstacle clearance is ensured until reaching LSALT	2	
(b)	departure track is intercepted within 5 nm of aerodrome	2	
(c)	conduct take-off and departure from an aerodrome which is remote from ground lighting as follows:		
	(i) climb out after take-off, using instruments as the primary reference	2	
	(ii) after take-off checks are performed at a safe height	2	
NVR2.9	**Navigate the aircraft under NVFR**		
(a)	cockpit and instrument lighting are adjusted to allow reference to documentation, instruments and lookout	2	
(b)	manages and interprets outputs of on-board navigation systems	2	
(c)	aircraft position fix is determined visually or with reference to navigation aid and system	2	
(d)	updates navigation log	2	
(e)	maintains fuel log	2	
(f)	uses a recognised navigation work cycle	2	
(g)	tracks are intercepted to and from visually or with reference to navigation aids and systems	2	
(h)	track is maintained within tolerances specified in published procedures	2	
(i)	timings are recorded, assessed and revised as required	2	
(j)	station passage is recognised	2	
(k)	planned route above LSALT is maintained	2	
(l)	route and destination weather conditions are monitored and appropriate actions are executed	2	
(m)	descent point is calculated and amended	2	
NVR2.11	**Manage hazardous weather conditions**		
(a)	hazardous weather conditions are identified and avoided	2	
(b)	procedures for avoidance of hazardous weather are demonstrated and explained	2	
(c)	aircraft systems are employed to mitigate the effects of hazardous weather	2	
NVR2.12	**Manage emergency situations at night**		
(a)	(in simulated conditions) aircraft control is maintained	2	
(b)	emergency situation is managed in accordance published procedures	2	
(c)	electrical lighting and power sources are monitored	2	
(d)	electrical lighting and power source emergency procedures are conducted as appropriate	2	
NVR2.13	**Conduct a diversion to revised route or alternate aerodrome at night**		
(a)	requirement for an unplanned diversion is recognised and confirmed	2	
(b)	route to alternate aerodrome, navigation aid and revised track is determined	2	

LESSON PLAN AND TRAINING RECORD
NVFR(A) 6: NIGHT NAVIGATION EXERCISE #1

FLIGHT TRAINING **Suggested flight time: 2.0 hours dual (night) (0.2 IF)**			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	 **Achieved***
(c)	planned route maintains height above LSALT in accordance with regulations while flying under NVFR	2	
(d)	flight planned route is diverted to track to an alternate aerodrome, navigation aid or aerodrome	2	
(e)	operational information for alternate aerodrome(s) is reviewed and applied according to published procedures	2	
(f)	fuel plan is reviewed and amended according to published procedures	2	
NVR2.14	**Make visual approach at night**		
(a)	descent below LSALT is conducted in accordance with published procedures;	2	
(b)	track is maintained to destination aerodrome	2	
(c)	conduct an approach and landing at an aerodrome that is remote from extensive ground lighting	2	
NVR2.15	**Perform a go-around**		
(a)	the need to conduct a go-around is recognised	2	
(b)	go-around is performed from any point on base and final approach legs	2	
IFF.1	**Determine and monitor the serviceability of flight instruments and instrument power sources**	2	
IFF.2	**Perform manoeuvres using full instrument panel**	2	
IFL.1	**Recognise failure of attitude indicator and stabilised heading indicator**	2	
IFL.2	**Perform manoeuvres – limited panel** *(during normal cruise)*	2	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	 **Achieved**

	LESSON PLAN AND TRAINING RECORD **NVFR(A) 6: NIGHT NAVIGATION EXERCISE #1**

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

NVFR Rating – Single Engine Aeroplane Night VFR Endorsement

LESSON PLAN AND TRAINING RECORD
NVFR(A) 7: NIGHT NAVIGATION EXERCISE #2

Flight no:	NVFR(A)7.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- VMC by day - recover from upset situations and unusual attitudes during simulated instrument flight
- Night navigation route: **YRED – YBSU – YBUD – YHBA - YRED**
- Circuits and full stop landing at YBUD
- Revise instrument flight
- Diversion
- **Assess** all performance criteria
- Flight manoeuvres to be performed within the flight tolerances mentioned in Table 1, Schedule 8 of the Part 61 MOS

PRE-FLIGHT KNOWLEDGE
Long Briefing: as required Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Long briefing – Revision as required

Underpinning knowledge
- Review previously introduced underpinning knowledge as required
- Flight test knowledge requirements:
  - the principles and limitations of the night VFR rating and the night VFR endorsement that is covered by the flight test
  - flight review requirements
  - night recency requirements
  - NVFR operations
  - interpreting operational and meteorological information
  - ground and aircraft lighting requirements
  - night VFR planning
  - use of instrument and navigation systems
  - take-off minima
  - holding and alternate requirements
  - night VFR procedures for all airspace classifications
  - departure and approach procedures
  - operations below LSALT and MSA for day and night operations
  - hazardous weather and conditions
  - GNSS
  - ERSA normal and emergency procedures

LESSON PLAN AND TRAINING RECORD
NVFR(A) 7: NIGHT NAVIGATION EXERCISE #2

PRE-FLIGHT KNOWLEDGE **Long Briefing: as required Pre-flight Briefing: 0.3 hour** **Underpinning knowledge: as required**	
Content	
HF & NTS • Review previously introduced HF & NTS knowledge and considerations	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 2.9 hours dual (0.4 day, 2.5 night) (0.3 IF)

MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
NVR1.1	**Control aircraft on the ground at night**		
(a)	instrument and cockpit lighting are adjusted to an appropriate level for taxiing	1	
(b)	ATC instructions and manoeuvres of the aircraft on the ground at night within the approved movement area as defined by aerodrome ground lighting are complied with	1	
(c)	aircraft lighting to identify obstructions, other aircraft and taxiway and runway limits is used as required	1	
(d)	aircraft is taxied at a speed which allows for an adequate lookout to be maintained to avoid obstructions	1	
NVR1.2	**Activate pilot activated lighting (PAL)**		
(a)	operational documents applicable to the flight are obtained and checked for currency	1	
(b)	applicable information contained in documents for flight planning and management is interpreted and applied	1	
(c)	documents required for the flight are stowed and accessibility for the pilot during flight is ensured	1	
NVR1.3	**Take-off aircraft at night**		
(a)	aircraft is lined up correctly in centre of runway in take-off direction	1	
(b)	line-up checks appropriate to night take-off are completed	1	
(c)	take-off by reference to flare path and runway lighting and aircraft instruments is executed	1	
(d)	aircraft is rotated at manufacturer's recommended speed	1	

LESSON PLAN AND TRAINING RECORD
NVFR(A) 7: NIGHT NAVIGATION EXERCISE #2

FLIGHT TRAINING
Suggested flight time: 2.9 hours dual (0.4 day, 2.5 night) (0.3 IF)

MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved*
(e)	climb attitude and control aircraft in climb, after take-off solely by reference to instruments is completed	1	
(f)	alignment with runway by visual reference and lookout is established and maintained	1	
(g)	after take-off, checks are performed at a safe height	1	
NVR1.4	**Fly a circuit pattern at night**		
	perform a circuit pattern safely and in accordance with the specified procedures and approved techniques	1	
NVR1.5	**Manage emergency situations at night**		
(a)	(in simulated conditions) aircraft control is maintained	1	
(b)	emergency situation is managed in accordance published procedures	1	
(c)	electrical lighting and power sources are monitored	1	
(d)	electrical lighting and power source emergency procedures are conducted as appropriate	1	
NVR1.6	**Perform a go-around**		
(a)	the need to conduct a go-around is recognised	1	
(b)	go-around is performed from any point on base and final approach legs	1	
NVR1.7	**Land at night, with and without the use of aircraft landing lights**		
(a)	circuit entry and pattern are performed with reference to runway environment	1	
(b)	safe altitude is maintained by reference to aircraft instruments and runway lighting	1	
(c)	aircraft is safely landed at night with and without landing lights	1	
(d)	after landing checks are performed	1	
NVR2.1	**Determine aircraft meets requirements for NVFR flight**		
(a)	aircraft requirements for NVFR flight are determined	1	
(b)	flight and navigation instruments, minimum electrical lighting and navigation equipment and any other requirements which are fitted to the aircraft are checked to ensure they are suitable and serviceable for NVFR flight	1	
NVR2.2	**Obtain and use current operational documents**		
(a)	operational documents applicable to the flight are obtained and checked for currency	1	
(b)	applicable information contained in documents for flight planning and management is interpreted and applied	1	
(c)	documents required for the flight are stowed and accessibility for the pilot during flight is ensured	1	
NVR2.3	**Prepare flight plan for NVFR flight**		
(a)	charts suitable for intended NVFR flight are selected and prepared	1	
(b)	applicable information to prepare a flight plan which details tracks, distances, times, altitudes to be flown and fuel requirements to reach destination are obtained, analysed and applied	1	
(c)	meteorological, airways facilities, aerodrome and NOTAM information applicable to planning and conducting a flight is obtained, interpreted and applied	1	
(d)	routes to optimise options in the event of an engine failure are planned	1	
NVR2.4	**Determine operational requirements**		
(a)	suitability of the aerodrome lighting for night operations is determined	1	
(b)	curfew requirements are complied with	1	
(c)	duration of flight is determined	1	
(d)	holding, alternate and reserve fuel requirements due to weather, navigation aid availability and aerodrome lighting are determined in accordance with operational requirements	1	
(e)	total fuel requirements are calculated	1	

LESSON PLAN AND TRAINING RECORD
NVFR(A) 7: NIGHT NAVIGATION EXERCISE #2

FLIGHT TRAINING Suggested flight time: 2.9 hours dual (0.4 day, 2.5 night) (0.3 IF)			
MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
NVR2.5	**Make flight notification**		
(a)	flight notification is prepared for planned NVFR flight	1	
(b)	completed flight notification is submitted	1	
(c)	flight notification acceptance is confirmed	1	
NVR2.6	**Program navigation system**		
(a)	prepare data for transfer to approved airborne navigation system	1	
(b)	navigation data is loaded and checked	1	
NVR2.7	**Select, operate and monitor navigation aids and systems**		
(a)	appropriate navigation aids and systems for the planned NVFR flight are selected and operated in accordance navigation aid and system requirements	1	
(b)	integrity of navigation aid and systems information is monitored and maintained	1	
NVR2.8	**Make visual departure at night**		
(a)	obstacle clearance is ensured until reaching LSALT	1	
(b)	departure track is intercepted within 5 nm of aerodrome	1	
(c)	conduct take-off and departure from an aerodrome which is remote from ground lighting as follows:		
	(i) climb out after take-off, using instruments as the primary reference	1	
	(ii) after take-off checks are performed at a safe height	1	
NVR2.9	**Navigate the aircraft under NVFR**		
(a)	cockpit and instrument lighting are adjusted to allow reference to documentation, instruments and lookout	1	
(b)	manages and interprets outputs of on-board navigation systems	1	
(c)	aircraft position fix is determined visually or with reference to navigation aid and system	1	
(d)	updates navigation log	1	
(e)	maintains fuel log	1	
(f)	uses a recognised navigation work cycle	1	
(g)	tracks are intercepted to and from visually or with reference to navigation aids and systems	1	
(h)	track is maintained within tolerances specified in published procedures	1	
(i)	timings are recorded, assessed and revised as required	1	
(j)	station passage is recognised	1	
(k)	planned route above LSALT is maintained	1	
(l)	route and destination weather conditions are monitored and appropriate actions are executed	1	
(m)	descent point is calculated and amended	1	
NVR2.10	**Comply with air traffic control rules and procedures for NVFR flights**		
(a)	separation from other air traffic maintained	1	
(b)	airspace requirements are complied with	1	
(c)	two-way communication is maintained with ATS and other aircraft	1	
(d)	ATC clearances and radar vectoring instructions are complied with	1	
NVR2.11	**Manage hazardous weather conditions**		
(a)	hazardous weather conditions are identified and avoided	1	
(b)	procedures for avoidance of hazardous weather are demonstrated and explained	1	
(c)	aircraft systems are employed to mitigate the effects of hazardous weather	1	

LESSON PLAN AND TRAINING RECORD
NVFR(A) 7: NIGHT NAVIGATION EXERCISE #2

FLIGHT TRAINING
Suggested flight time: 2.9 hours dual (0.4 day, 2.5 night) (0.3 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
NVR2.12	**Manage emergency situations at night**		
(a)	(in simulated conditions) aircraft control is maintained	1	
(b)	emergency situation is managed in accordance published procedures	1	
(c)	electrical lighting and power sources are monitored	1	
(d)	electrical lighting and power source emergency procedures are conducted as appropriate	1	
NVR2.13	**Conduct a diversion to revised route or alternate aerodrome at night**		
(a)	requirement for an unplanned diversion is recognised and confirmed	1	
(b)	route to alternate aerodrome, navigation aid and revised track is determined	1	
(c)	planned route maintains height above LSALT in accordance with regulations while flying under NVFR	1	
(d)	flight planned route is diverted to track to an alternate aerodrome, navigation aid or aerodrome	1	
(e)	operational information for alternate aerodrome(s) is reviewed and applied according to published procedures	1	
(f)	fuel plan is reviewed and amended according to published procedures	1	
NVR2.14	**Make visual approach at night**		
(a)	descent below LSALT is conducted in accordance with published procedures;	1	
(b)	track is maintained to destination aerodrome	1	
(c)	conduct an approach and landing at an aerodrome that is remote from extensive ground lighting	1	
NVR2.15	**Perform a go-around**		
(a)	the need to conduct a go-around is recognised	1	
(b)	go-around is performed from any point on base and final approach legs	1	
IFF.1	**Determine and monitor the serviceability of flight instruments and instrument power sources**		
(a)	determine serviceability of flight and navigational instruments	1	
(b)	perform functional checks of flight and navigational instruments where applicable prior to take-off	1	
(c)	monitor flight instrument and instrument power sources and react to any warnings, unserviceability or erroneous indications	1	
IFF.2	**Perform manoeuvres using full instrument panel**	1	
(a)	interpret flight instrument indications and apply procedures and techniques to achieve and maintain a specified flight path using the aircraft's full instrument panel	1	
(b)	set and maintain power and attitude by reference to the full instrument panel to achieve the following:		
	(i) straight and level performance during normal cruise within the flight tolerances	1	
	(ii) nominated climb performance within the flight tolerances	1	
	(iii) descent performance within the flight tolerances	1	
(c)	set and maintain power and attitude by reference to the full instrument panel to establish a rate 1 turn onto a nominated heading within the flight tolerances	1	
IFF.3	**Recover from upset situations and unusual attitudes** *(VMC by day)*	1	
(a)	correctly identify upset situations and unusual attitudes under simulated IMC	1	
(b)	recover to controlled flight from upset situations and unusual attitudes under simulated IMC from any combination of the following aircraft states:		
	(i) high and low-nose attitudes	1	
	(ii) varying angles of bank	1	
	(iii) various power settings	1	
	(iv) various aircraft configurations	1	
	(v) unbalanced flight	1	

LESSON PLAN AND TRAINING RECORD
NVFR(A) 7: NIGHT NAVIGATION EXERCISE #2

FLIGHT TRAINING **Suggested flight time: 2.9 hours dual (0.4 day, 2.5 night) (0.3 IF)**			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	**Achieved***
IFL.1	**Recognise failure of attitude indicator and stabilised heading indicator**		
(a)	monitor flight instruments and instrument power sources and recognise warning indicators or erroneous instrument indications	**1**	
(b)	transition from a full instrument panel to a limited instrument panel	**1**	
IFL.2	**Perform manoeuvres – limited panel**	**1**	
(a)	interpret and respond appropriately to instrument indications	**1**	
(b)	apply power and attitude settings to achieve straight and level performance during:		
	(i) normal cruise	**1**	
	(ii) approach configuration with flaps (when fitted) and undercarriage down	**1**	
(c)	apply power and attitude settings to achieve:		
	(i) nominated climb performance;	**1**	
	(ii) nominated descent performance	**1**	
	(iii) during climb, descent and straight and level flight, rate 1 turns onto a nominated heading	**1**	
(d)	trim (as applicable) and balance aircraft	**1**	
(e)	establish level flight at a nominated altitude, from a climb or descent during straight or turning flight	**1**	
IFL.3	**Recover from upset situations and unusual attitudes – limited panel** *(VMC by day)*		
(a)	correctly identify upset situations and unusual attitudes under simulated IMC	**1**	
(b)	recover to stabilised straight and level flight using approved techniques from upset situations and unusual attitudes under simulated IMC from any combination of the following aircraft states:		
	(i) high and low-nose attitudes	**1**	
	(ii) varying angles of bank	**1**	
	(iii) various power settings	**1**	
	(iv) various aircraft configurations	**1**	
	(v) unbalanced flight	**1**	
IFL.4	**Re-establish visual flight**		
(a)	transition from visual flight conditions to instrument flight conditions while maintaining control of the aircraft	**1**	
(b)	perform a manoeuvre to re-establish visual flight	**1**	
(c)	implement a plan that ensures the flight continues in VMC	**1**	
NTS1.1	**Maintain effective lookout**		
(a)	maintain traffic separation using a systematic visual scan technique at a rate determined by traffic density, visibility and terrain	**1**	
(b)	maintain radio listening watch and interpret transmissions to determine traffic location and intentions	**1**	
(c)	perform airspace-cleared procedure before commencing any manoeuvre	**1**	
NTS1.2	**Maintain situational awareness**		
(a)	monitor all aircraft systems using a systematic scan technique	**1**	
(b)	collect information to facilitate ongoing system management	**1**	
(c)	monitor flight environment for deviations from planned operations	**1**	
(d)	collect flight environment information to update planned operations	**1**	
NTS1.3	**Assess situations and make decisions**		
(a)	identify problems	**1**	
(b)	analyse problems	**1**	

LESSON PLAN AND TRAINING RECORD
NVFR(A) 7: NIGHT NAVIGATION EXERCISE #2

FLIGHT TRAINING Suggested flight time: 2.9 hours dual (0.4 day, 2.5 night) (0.3 IF)			
MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
(c)	identify solutions	1	
(d)	assess solutions and risks	1	
(e)	decide on a course of action	1	
(f)	communicate plans of action (if appropriate)	1	
(g)	allocate tasks for action (if appropriate)	1	
(h)	take actions to achieve optimum outcomes for the operation	1	
(i)	monitor progress against plan	1	
(j)	re-evaluate plan to achieve optimum outcomes	1	
NTS1.4	**Set priorities and manage tasks**		
(a)	organise workload and priorities to ensure optimum outcome of the flight	1	
(b)	plan events and tasks to occur sequentially	1	
(c)	anticipate events and tasks to ensure sufficient opportunity for completion	1	
(d)	use technology to reduce workload and improve cognitive and manipulative activities	1	
NTS1.5	**Maintain effective communications and interpersonal relationships**		
(a)	establish and maintain effective and efficient communications and interpersonal relationships with all stakeholders to ensure the optimum outcome of the flight	1	
(b)	define and explain objectives to stakeholders	1	
(c)	demonstrate a level of assertiveness that ensures the optimum completion of the flight	1	
NTS2.1	**Recognise and manage threats**		
(a)	identify relevant environmental or operational threats that are likely to affect the safety of the flight	1	
(b)	identify when competing priorities and demands may represent a threat to the safety of the flight	1	
(c)	develop and implement countermeasures to manage threats	1	
(d)	monitor and assess flight progress to ensure a safe outcome, or modify actions when a safe outcome is not assured	1	
NTS2.2	**Recognise and manage errors**		
(a)	apply checklists and standard operating procedures to prevent aircraft handling, procedural or communication errors	1	
(b)	identify committed errors before safety is affected or the aircraft enters an undesired state	1	
(c)	monitor the following to collect and analyse information to identify potential or actual errors:		
	(i) aircraft systems using a systematic scan technique	1	
	(ii) the flight environment	1	
	(iii) other crew	1	
(d)	implement countermeasures to prevent errors or take action in the time available to correct errors before the aircraft enters an undesired state	1	
NTS2.3	**Recognise and manage undesired aircraft state**		
(a)	recognise an undesired aircraft state	1	
(b)	prioritise tasks to ensure an undesired aircraft state is managed effectively	1	
(c)	apply corrective actions to recover an undesired aircraft state in a safe and timely manner	1	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

LESSON PLAN AND TRAINING RECORD
NVFR(A) 7: NIGHT NAVIGATION EXERCISE #2

CONSOLIDATION AND/OR REMEDIAL TRAINING			
		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

NVFR Rating – Single Engine Aeroplane Night VFR Endorsement

LESSON PLAN AND TRAINING RECORD
NVFR(A) 8: NIGHT NAVIGATION EXERCISE #3 - PRE-LICENCE ASSESSMENT

Flight no:	NVFR(A)8.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- VMC by day - recover from upset situations and unusual attitudes during simulated instrument flight
- Night navigation route: **YRED – YKRY – YBUD – YHBA – YRED.**
- Circuits and full stop landing at YHBA OR YKRY (DEPENDS ON WHICH DESTINATION IS DIVERTED)
- **Assess** all performance criteria in preparation for flight test
- Flight manoeuvres to be performed within the flight tolerances mentioned in Table 1, Schedule 8 of the Part 61 MOS

PRE-FLIGHT KNOWLEDGE **Long Briefing: as required Pre-flight Briefing: 0.3 hour** **Underpinning knowledge: as required**	
Content	
Long briefing – Revision as required	
Underpinning knowledge • Assess underpinning knowledge • Review flight test knowledge requirements	
HF & NTS • Review previously introduced HF & NTS knowledge and considerations	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Theory examination • Night VFR(A) aeronautical knowledge examination (in-house) (in accordance with the knowledge standards specified in the Part 61 MOS) • Knowledge deficiency report (required when the knowledge examination pass is less than 100%)	
Pre-flight knowledge components complete:	**Instructor's signature & date**

LESSON PLAN AND TRAINING RECORD
NVFR(A) 8: NIGHT NAVIGATION EXERCISE #3 - PRE-LICENCE ASSESSMENT

Performance Standard		
3	2	1
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 2.9 hours dual (0.4 day, 2.5 night) (0.3 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
NVR1.1	Control aircraft on the ground at night	1	
NVR1.2	Activate pilot activated lighting (PAL)	1	
NVR1.3	Take-off aircraft at night	1	
NVR1.4	Fly a circuit pattern at night	1	
NVR1.5	Manage emergency situations at night	1	
NVR1.6	Perform a go-around	1	
NVR1.7	Land at night, with and without the use of aircraft landing lights	1	
NVR2.1	Determine aircraft meets requirements for NVFR flight	1	
NVR2.2	Obtain and use current operational documents	1	
NVR2.3	Prepare flight plan for NVFR flight	1	
NVR2.4	Determine operational requirements	1	
NVR2.5	Make flight notification	1	
NVR2.6	Program navigation system	1	
NVR2.7	Select, operate and monitor navigation aids and systems	1	
NVR2.8	Make visual departure at night	1	
NVR2.9	Navigate the aircraft under NVFR	1	
NVR2.10	Comply with air traffic control rules and procedures for NVFR flights	1	
NVR2.11	Manage hazardous weather conditions	1	
NVR2.12	Manage emergency situations at night	1	
NVR2.13	Conduct a diversion to revised route or alternate aerodrome at night	1	
NVR2.14	Make visual approach at night	1	
NVR2.15	Perform a go-around	1	
IFF.1	Determine and monitor the serviceability of flight instruments and instrument power sources	1	
IFF.2	Perform manoeuvres using full instrument panel	1	
IFF.3	Recover from upset situations and unusual attitudes *(VMC by day)*	1	
IFL.1	Recognise failure of attitude indicator and stabilised heading indicator	1	
IFL.2	Perform manoeuvres – limited panel	1	
IFL.3	Recover from upset situations and unusual attitudes – limited panel *(VMC by day)*	1	
IFL.4	Re-establish visual flight	1	

LESSON PLAN AND TRAINING RECORD
NVFR(A) 8: NIGHT NAVIGATION EXERCISE #3 - PRE-LICENCE ASSESSMENT

FLIGHT TRAINING Suggested flight time: 2.9 hours dual (0.4 day, 2.5 night) (0.3 IF)			
		Performance Standard	
MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Required	Achieved*
NTS1.1	Maintain effective lookout	1	
NTS1.2	Maintain situational awareness	1	
NTS1.3	Assess situations and make decisions	1	
NTS1.4	Set priorities and manage tasks	1	
NTS1.5	Maintain effective communications and interpersonal relationships	1	
NTS2.1	Recognise and manage threats	1	
NTS2.2	Recognise and manage errors	1	
NTS2.3	Recognise and manage undesired aircraft state	1	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING			
		Performance Standard	
MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Required	Achieved

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

LESSON PLAN AND TRAINING RECORD
NVFR(A) 8: NIGHT NAVIGATION EXERCISE #3 - PRE-LICENCE ASSESSMENT

COMMENTS AND OUTCOME		
Proceed to NVFR(A) flight test?#	**Yes**	**No**

#Each of the performance criteria contained within the units of competency for the Night VFR Rating –Single engine aeroplane night VFR endorsement must have been assessed to performance standard 1, on a minimum of two separate flights.

Instructor's signature & date	**Trainee's signature & date**

ACCELERATED COMPETENCY

Flight no:		**Trainee name & ARN:**	
Date:		**Instructor:**	

FLIGHT TRAINING		
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard Achieved**

COMMENTS

Instructor's signature & date	**Trainee's signature & date**

This form is to be used to record the assessments which are made ahead of the syllabus schedule (i.e. not included in the lesson plan and training record form).

Enter the assessed performance criteria and the standard achieved. Attach the form to the lesson plan and training record form for the lesson in which the early assessment was made.

5.5 DESIGN FEATURE SYLLABUS

Planning Matrix **Design Feature Endorsements - Retractable Undercarriage and Manual Propeller Pitch Control v1.0**

Performance Standards
3 = Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue.
2 = Demonstrates a developing level of proficiency.
1 = Achieves competency to the standard required for qualification issue.

		1 General handling	2 Circuits	3 Consolidation	4 Endorsement check*	Total hours
	Dual day	1.2	1.0	1.0	2.0*	5.2
Units, Elements and Performance Criteria						
DFE2	**Retractable undercarriage**					
DFE2.1	**Retractable undercarriage in normal flight**					
(a)	retract undercarriage	3	2	1	1	
(b)	establish a positive rate of climb before selecting undercarriage up	3	2	1	1	
(c)	identify undercarriage selector and select undercarriage up	3	2	1	1	
(d)	confirm undercarriage is in transit	3	2	1	1	
(e)	confirm undercarriage is in the retracted and locked position by reference to undercarriage position indicators	3	2	1	1	
(f)	comply with undercarriage speed limitations (VLO)	3	2	1	1	
(g)	lower undercarriage	3	2	1	1	
(h)	comply with undercarriage lowering speed limits (VLE)	3	2	1	1	
(i)	identify undercarriage selector and select undercarriage down	3	2	1	1	
(j)	confirm undercarriage is in transit	3	2	1	1	
(k)	confirm undercarriage is in the lowered and locked position by reference to undercarriage position indicators	3	2	1	1	
DFE2.2	**Manage abnormal and emergency procedures applicable to retractable undercarriage**					
(a)	identify abnormal operation of undercarriage	3	2	1	1	
(b)	control aircraft	3	2	1	1	
(c)	manage abnormal or emergency operation of undercarriage to achieve a safe flight outcome	3	2	1	1	
DFE3	**Manual propeller pitch control**					
DFE3.1	**Perform pre-flight and pre-take-off checks for manual propeller pitch control**					
(a)	perform propeller pre-flight checks ensuring the serviceability of the following:					
	(i) propeller	3	2	1	1	
	(ii) spinner (when fitted)	3	2	1	1	
	(iii) backing plate	3	2	1	1	
(b)	CSU control rods and cables are checked to confirm they are intact and secure (when visible)	3	2	1	1	
(c)	perform propeller pre-take-off checks, including the following:					
	(i) oil temperature and pressure within limits	3	2	1	1	
	(ii) function of propeller pitch control at specified RPM	3	2	1	1	
	(iii) function of propeller feather system when applicable					
DFE3.2	**Operate manual propeller pitch control during ground and flight operations**					
(a)	operates manual propeller pitch control on the ground within the limitations and conditions specified in AFM and POH, ensuring:					
	(i) idle RPM within limits	3	2	1	1	
	(ii) propeller RPM responds appropriately to throttle	3	2	1	1	
	(iii) engine RPM is within limitations when take-off power is set	3	2	1	1	
(b)	operates manual propeller pitch control in flight within the limitations and conditions specified in AFM and POH and:					
	(i) sets RPM as required	3	2	1	1	
	(ii) monitors RPM remains within specified limits	3	2	1	1	
	(iii) synchronises engine RPM using propeller control on multi-engine aircraft					
	(iv) avoids oil congelation in cold weather operations by cycling engine RPM	3	2	1	1	
DFE3.3	**Manage abnormal and emergency procedures for a manual propeller pitch control**					
(a)	identifies abnormal or emergency operations of manual propeller pitch control or CSU	3	2	1	1	
(b)	maintains control of engine RPM	3	2	1	1	
(c)	performs appropriate abnormal or emergency procedures	3	2	1	1	
(d)	feathers and unfeathers propeller					

*****_DFE 4 may be combined with the CPL non-integrated training course lesson CPL (A) 7 (navigation exercise #4)_

Note – general competency requirement:

- **In addition to demonstrating competency in the units DFE2 and DFE3, trainees must meet the general competency requirement of CASR 61.385 prior to exercising the privileges of their pilot licence within the aeroplane.**
- **Lesson plan and training records provide an example of items which may be included during endorsement training in order to meet the general competency requirement; however training providers must determine the most appropriate inclusions when considering the aeroplane complexity, operating procedures and limitations.**

1

Retractable Undercarriage and Manual Propeller Pitch Control Design Feature Endorsements

LESSON PLAN AND TRAINING RECORD
DFE 1: GENERAL HANDLING

Flight no:	DFE 1.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- Introduction to retractable undercarriage and variable pitch propeller systems and their operation
- Pre-flight considerations - including weight and balance and performance calculations, items to be inspected relevant to retractable undercarriage and manual propeller pitch control, loading of passengers and cargo
- Cockpit controls and indicators, warning systems
- Normal, abnormal and emergency procedures applicable to manual propeller pitch control and retractable undercarriage, including observation of operating limitations for retractable undercarriage
- Aeroplane familiarisation and general competency – other operating systems and limitations, navigation systems, general handling exercises including steep turns, stalling, practice forced landing#

#The CASR 61.385 general competency requirement must be met prior to endorsement issue. The flight training and assessment required to meet this requirement must be determined by the training provider, when taking into account the aeroplane complexity, operating procedures and limitations. This syllabus provides an example only.

PRE-FLIGHT KNOWLEDGE
Long Briefing: 1.0 hour each Pre-flight Briefing: 0.5 hour
Underpinning knowledge: as required

Content

Long briefings (for completion prior to flight lesson DFE1):

- **Retractable undercarriage system**
- **Constant speed unit and variable pitch propeller**
- **Aeroplane navigation and operating systems, general handling, normal and abnormal operations**

Underpinning knowledge

- Contents of the flight manual and POH
- **DFE2 Retractable undercarriage -** source of power, cockpit indications for down and locked, retracted and in transit, conditions causing undercarriage warning horn to sound, how landing gear doors are opened and closed, method of preventing retraction on the ground, VLE, VLO, how long the undercarriage takes to extend and retract, emergency procedures to extend and lock the undercarriage down [DFE2 4(a)-(k)]
- **DFE3 Manual propeller pitch control** - effects of loss of oil pressure to the CSU, effects of loss of oil pressure on propeller pitch (if applicable), effects of counterweights on engine RPM (if applicable), the function of oil pressure on the CSU, the function of the fine and coarse pitch stops, the effect that failure of the fine pitch stops may cause, the effects of the use of carburettor heat, propeller over-speed, indications of engine ice, indications that carburettor ice has been cleared, effects on manifold pressure of reducing RPM in a normally aspirated engine below full throttle height [DFE3 4(a)-(k)]

LESSON PLAN AND TRAINING RECORD
DFE 1: GENERAL HANDLING

PRE-FLIGHT KNOWLEDGE
Long Briefing: 1.0 hour each Pre-flight Briefing: 0.5 hour
Underpinning knowledge: as required

Content

HF & NTS

- Effective communication under normal and non-normal circumstances, task management [NTS1 & NTS2 4(a), NTS1 4(b), NTS2 4(i)]
- Threat and error management detailing processes that can be used to identify and mitigate or control threats and errors, the application of situation awareness to identifying real or potential environmental or operational threats to flight safety, developing and implementing plans of action for removing and mitigating threats, and removing and mitigating errors, undesired aircraft states, including prevention, identifying and controlling, how an undesired aircraft state can develop from an unmanaged threat or error, use of checklists and standard operating procedures to prevent errors [NTS2 4(b)-(f),(g)]
- Potential causes for inadvertent undercarriage retraction on the ground and failure to extend undercarriage in flight

Pre-flight briefing

- Review flight sequences, what to expect, see & do
- Check essential knowledge
- Reinforce threat & error management
- Reinforce significant airmanship points

Pre-flight knowledge components complete:	Instructor's signature & date

Performance Standard		
3	2	1
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.2 hours dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
Design Feature Endorsement Competencies			
DFE3.1	**Perform pre-flight and pre-take-off checks for manual propeller pitch control**		
(a)	perform propeller pre-flight checks ensuring the serviceability of the following:		
	(i) propeller	3	
	(ii) spinner (when fitted)	3	
	(iii) backing plate	3	
(b)	CSU control rods and cables are checked to confirm they are intact and secure (when visible)	3	
(c)	perform propeller pre-take-off checks, including the following:		

LESSON PLAN AND TRAINING RECORD
DFE 1: GENERAL HANDLING

FLIGHT TRAINING Suggested flight time: 1.2 hours dual			
MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
	(i) oil temperature and pressure within limits	3	
	(ii) function of propeller pitch control at specified RPM	3	
DFE3.2	**Operate manual propeller pitch control during ground and flight operations**		
(a)	operates manual propeller pitch control on the ground within the limitations and conditions specified in AFM and POH, ensuring:		
	(i) idle RPM within limits	3	
	(ii) propeller RPM responds appropriately to throttle	3	
	(iii) engine RPM is within limitations when take-off power is set	3	
(b)	operates manual propeller pitch control in flight within the limitations and conditions specified in AFM and POH and:		
	(i) sets RPM as required	3	
	(ii) monitors RPM remains within specified limits	3	
	(iv) avoids oil congelation in cold weather operations by cycling engine RPM	3	
DFE3.3	**Manage abnormal and emergency procedures for a manual propeller pitch control**		
(a)	identifies abnormal or emergency operations of manual propeller pitch control or CSU	3	
(b)	maintains control of engine RPM	3	
(c)	performs appropriate abnormal or emergency procedures	3	
DFE2.1	**Retractable undercarriage in normal flight**		
(a)	retract undercarriage	3	
(b)	establish a positive rate of climb before selecting undercarriage up	3	
(c)	identify undercarriage selector and select undercarriage up	3	
(d)	confirm undercarriage is in transit	3	
(e)	confirm undercarriage is in the retracted and locked position by reference to undercarriage position indicators	3	
(f)	comply with undercarriage speed limitations (VLO)	3	
(g)	lower undercarriage	3	
(h)	comply with undercarriage lowering speed limits (VLE)	3	
(i)	identify undercarriage selector and select undercarriage down	3	
(j)	confirm undercarriage is in transit	3	
(k)	confirm undercarriage is in the lowered and locked position by reference to undercarriage position indicators	3	
DFE2.2	**Manage abnormal and emergency procedures applicable to retractable undercarriage**		
(a)	identify abnormal operation of undercarriage	3	
(b)	control aircraft	3	
(c)	manage abnormal or emergency operation of undercarriage to achieve a safe flight outcome	3	

LESSON PLAN AND TRAINING RECORD
DFE 1: GENERAL HANDLING

FLIGHT TRAINING
Suggested flight time: 1.2 hours dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
Aeroplane General Competency			
C2.1	**Pre-flight actions and procedures** *(including minimum equipment list, weight & balance calculations, take-off and landing performance calculations)*	2	
C4.1	**Plan fuel requirements**	2	
C2.2	**Perform pre-flight inspection** *(including retractable undercarriage pre-flight checks)*	2	
C4.2	**Manage fuel system**	2	
C5	**Manage passengers and cargo** *(including pre-flight safety briefing, use of seat harnesses, escape hatches, exits and emergency equipment. Loading of cargo, distribution and limitations)*	2	
A1.1	**Start engine**	2	
A1.2	**Taxi aeroplane**	2	
A2.1	**Carry out pre take-off procedures**	2	
A2.2	**Take off aeroplane**	2	
A2.4	**Carry out after take-off procedures**	2	
A3.1	**Climb aeroplane** *(including best angle and best rate climb)*	2	
A3.2	**Maintain straight and level flight** *(including at slow speed and during acceleration and deceleration)*	2	
A3.4	**Turn aeroplane**	2	
A5.1	**Enter and recover from stall** *(including incipient stall, stall without power applied, turning and climbing stalls, approach configuration stalls)*	2	
A5.3	**Turn aeroplane steeply**	2	
A6.3	**Perform forced landing (simulated)** *(simulated complete engine failure)*	2	
A3.3	**Descend aeroplane** *(including glide and powered descents)*	2	
NTS1.1	**Maintain effective lookout**	2	
NTS1.2	**Maintain situational awareness**	2	
NTS1.3	**Assess situations and make decisions**	2	
NTS1.4	**Set priorities and manage tasks**	2	
NTS1.5	**Maintain effective communications and interpersonal relationships**	2	
NTS2.1	**Recognise and manage threats**	2	
NTS2.2	**Recognise and manage errors**	2	
NTS2.3	**Recognise and manage undesired aircraft state**	2	
A4.1	**Land aeroplane**	2	
A1.1	**Stop engine**	2	
C2.3	**Post-flight actions and procedures**	2	

	LESSON PLAN AND TRAINING RECORD **DFE 1: GENERAL HANDLING**

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

Retractable Undercarriage and Manual Propeller Pitch Control Design Feature Endorsements

LESSON PLAN AND TRAINING RECORD
DFE 2: CIRCUITS

Flight no:	DFE 2.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- Circuits, including#:
  - normal take-off, crosswind take-off, 'short field' take-off, manage engine failure on take-off (simulated), manage engine failure in the circuit area (simulated)
  - land aeroplane, land aeroplane in a crosswind, short landing, conduct missed approach, recovery from missed landing
- Revise DFE units of competency

#The CASR 61.385 general competency requirement must be met prior to endorsement issue. The flight training and assessment required to meet this requirement must be determined by the training provider, when taking into account the aeroplane complexity, operating procedures and limitations. This syllabus provides an example only.

PRE-FLIGHT KNOWLEDGE
Long Briefing: 0.8 hours Pre-flight Briefing: 0.3 hour
Underpinning knowledge: as required

Content

Long briefing – Circuits
- Take-off technique
- Aeroplane operating procedures and checklists
- Traffic management
- Approach technique, judgement of aeroplane approach profile and regaining correct approach path
- Landing technique
- Procedures and cautions during landing roll

Underpinning knowledge
- Revise as required

HF & NTS
- Revise as required
- Emphasise the use of checklists and standard operating procedures to prevent errors [NTS2 4(h)]
- Traffic management – speed control, circuit pattern adjustments

Pre-flight briefing
- Review flight sequences, what to expect, see & do
- Check essential knowledge
- Reinforce threat & error management
- Reinforce significant airmanship points

Pre-flight knowledge components complete:	**Instructor's signature & date**

LESSON PLAN AND TRAINING RECORD
DFE 2: CIRCUITS

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 1.0 hour dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
Design Feature Endorsement Competencies			
DFE3.1	**Perform pre-flight and pre-take-off checks for manual propeller pitch control**		
(a)	perform propeller pre-flight checks ensuring the serviceability of the following:		
	(i) propeller	2	
	(ii) spinner (when fitted)	2	
	(iii) backing plate	2	
(b)	CSU control rods and cables are checked to confirm they are intact and secure (when visible)	2	
(c)	perform propeller pre-take-off checks, including the following:		
	(i) oil temperature and pressure within limits	2	
	(ii) function of propeller pitch control at specified RPM	2	
DFE3.2	**Operate manual propeller pitch control during ground and flight operations**		
(a)	operates manual propeller pitch control on the ground within the limitations and conditions specified in AFM and POH, ensuring:		
	(i) idle RPM within limits	2	
	(ii) propeller RPM responds appropriately to throttle	2	
	(iii) engine RPM is within limitations when take-off power is set	2	
(b)	operates manual propeller pitch control in flight within the limitations and conditions specified in AFM and POH and:		
	(i) sets RPM as required	2	
	(ii) monitors RPM remains within specified limits	2	
	(iv) avoids oil congelation in cold weather operations by cycling engine RPM	2	
DFE3.3	**Manage abnormal and emergency procedures for a manual propeller pitch control**		
(a)	identifies abnormal or emergency operations of manual propeller pitch control or CSU	2	
(b)	maintains control of engine RPM	2	
(c)	performs appropriate abnormal or emergency procedures	2	
DFE2.1	**Retractable undercarriage in normal flight**		
(a)	retract undercarriage	2	
(b)	establish a positive rate of climb before selecting undercarriage up	2	
(c)	identify undercarriage selector and select undercarriage up	2	
(d)	confirm undercarriage is in transit	2	
(e)	confirm undercarriage is in the retracted and locked position by reference to undercarriage position indicators	2	
(f)	comply with undercarriage speed limitations (VLO)	2	
(g)	lower undercarriage	2	
(h)	comply with undercarriage lowering speed limits (VLE)	2	

LESSON PLAN AND TRAINING RECORD
DFE 2: CIRCUITS

FLIGHT TRAINING **Suggested flight time: 1.0 hour dual**			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** Required	Achieved*
(i)	identify undercarriage selector and select undercarriage down	2	
(j)	confirm undercarriage is in transit	2	
(k)	confirm undercarriage is in the lowered and locked position by reference to undercarriage position indicators	2	
DFE2.2	**Manage abnormal and emergency procedures applicable to retractable undercarriage**		
(a)	identify abnormal operation of undercarriage	2	
(b)	control aircraft	2	
(c)	manage abnormal or emergency operation of undercarriage to achieve a safe flight outcome	2	
Aeroplane Familiarisation and General Competency			
A2.2	**Take off aeroplane**	2	
A2.3	**Take off aeroplane in a crosswind**	2	
A2.5	**Take off aeroplane from ‘short field’**	2	
A6.1	**Manage engine failure - take-off (simulated)**	2	
A2.4	**Carry out after take-off procedures**	2	
A3.6	**Perform circuits and approaches**	2	
A6.2	**Manage engine failure in the circuit area (simulated)**	2	
NTS1.1	**Maintain effective lookout**	2	
NTS1.2	**Maintain situational awareness**	2	
NTS1.3	**Assess situations and make decisions**	2	
NTS1.4	**Set priorities and manage tasks**	2	
NTS1.5	**Maintain effective communications and interpersonal relationships**	2	
NTS2.1	**Recognise and manage threats**	2	
NTS2.2	**Recognise and manage errors**	2	
NTS2.3	**Recognise and manage undesired aircraft state**	2	
A4.1	**Land aeroplane**	2	
A4.2	**Land aeroplane in a crosswind**	2	
A4.3	**Conduct a missed approach**	2	
A4.4	**Perform recovery from missed landing**	2	
A4.5	**Short landing**	2	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

LESSON PLAN AND TRAINING RECORD
DFE 2: CIRCUITS

CONSOLIDATION AND/OR REMEDIAL TRAINING			
		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Required**	**Achieved**

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

Retractable Undercarriage and Manual Propeller Pitch Control Design Feature Endorsements

LESSON PLAN AND TRAINING RECORD
DFE 4: PRE-ENDORSEMENT CHECK

Flight no:	DFE 4.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
May be combined with CPL(A) 7 (navigation exercise #4) – CPL non-integrated training course
- Design feature endorsement assessment
- Navigation route: [Enter navigation route]
- **Assess**:
  - DFE units of competency
  - general competency to meet the requirement of CASR 61.385
  - flight manoeuvres to be performed within the flight tolerances applicable to the private level, as mentioned in Schedule 8 of the Part 61 MOS

#The CASR 61.385 general competency requirement must be met prior to endorsement issue. The flight training and assessment required to meet this requirement must be determined by the training provider, when taking into account the aeroplane complexity, operating procedures and limitations. This syllabus provides an example only.

PRE-FLIGHT KNOWLEDGE **Long Briefing: as required Pre-flight Briefing: as required** **Underpinning knowledge: as required**	
Content	
Long briefing • Revision as required	
Underpinning knowledge • Review as required relating to design feature endorsements, observe application of knowledge during flight • Privileges and limitations of the design feature endorsements	
HF & NTS • As required	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

LESSON PLAN AND TRAINING RECORD
DFE 4: PRE-ENDORSEMENT CHECK

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING **Suggested flight time: 2.0 hours dual**			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	**Achieved***
Design Feature Endorsement Competencies			
DFE3.1	Perform pre-flight and pre-take-off checks for manual propeller pitch control	1	
DFE3.2	Operate manual propeller pitch control during ground and flight operations	1	
DFE3.3	Manage abnormal and emergency procedures for a manual propeller pitch control	1	
DFE2.1	Retractable undercarriage in normal flight	1	
DFE2.2	Manage abnormal and emergency procedures applicable to retractable undercarriage	1	
Aeroplane Familiarisation and General Competency			
C2.1	Pre-flight actions and procedures	1	
C4.1	Plan fuel requirements	1	
C2.2	Perform pre-flight inspection	1	
C4.2	Manage fuel system	1	
C5	Manage passengers and cargo	1	
A1.1	Start engine	1	
A1.2	Taxi aeroplane	1	
A2.1	Carry out pre take-off procedures	1	
A2.2	Take off aeroplane	1	
A2.3	Take off aeroplane in a crosswind	1	
A2.5	Take off aeroplane from ‘short field’	1	
A6.1	Manage engine failure - take-off (simulated)	1	
A2.4	Carry out after take-off procedures	1	
A3.1	Climb aeroplane	1	
A3.2	Maintain straight and level flight	1	
A3.4	Turn aeroplane	1	
A5.1	Enter and recover from stall	1	
A5.3	Turn aeroplane steeply	1	
A6.3	Perform forced landing (simulated)	1	
A3.3	Descend aeroplane	1	
A3.6	Perform circuits and approaches	1	
A6.2	Manage engine failure in the circuit area (simulated)	1	
NTS1.1	Maintain effective lookout	1	
NTS1.2	Maintain situational awareness	1	

LESSON PLAN AND TRAINING RECORD
DFE 4: PRE-ENDORSEMENT CHECK

FLIGHT TRAINING Suggested flight time: 2.0 hours dual			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard Required	 Achieved*
NTS1.3	Assess situations and make decisions	1	
NTS1.4	Set priorities and manage tasks	1	
NTS1.5	Maintain effective communications and interpersonal relationships	1	
NTS2.1	Recognise and manage threats	1	
NTS2.2	Recognise and manage errors	1	
NTS2.3	Recognise and manage undesired aircraft state	1	
A4.1	Land aeroplane	1	
A4.2	Land aeroplane in a crosswind	1	
A4.3	Conduct a missed approach	1	
A4.4	Perform recovery from missed landing	1	
A4.5	Short landing	1	
A1.1	Stop engine	1	
C2.3	Post-flight actions and procedures	1	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard Required	 Achieved

LESSON PLAN AND TRAINING RECORD
DFE 4: PRE-ENDORSEMENT CHECK

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Issue retractable undercarriage and manual propeller pitch control design feature endorsements? ^	**Yes**	**No**

^Each of the performance criteria contained within the units of competency for the design feature endorsements must have been assessed to performance standard 1, on a minimum of two separate flights. The trainee must also meet the general competency requirement of CASR 61.385.

Instructor's signature & date	**Trainee's signature & date**

5.6 CPL SYLLABUS

Commercial Pilot Licence – Aeroplane Category Rating
Non-integrated Training Course

SYLLABUS INTRODUCTION

Overview

This syllabus describes the flight training and assessment activities to be undertaken during the commercial pilot licence (non-integrated) – aeroplane category rating training course.

The aim of the course is to provide the student with the required skills, knowledge and attitudes to safely exercise the commercial pilot licence– aeroplane category rating.

Flight training lessons include general handling and navigation exercises incorporating operations at controlled aerodromes and in controlled airspace, basic and advanced manoeuvres, circuit operations, basic instrument flight and procedures in the event of abnormal situations and emergencies. Human factors and non-technical skills awareness and application are also included.

Manual propeller pitch control and retractable undercarriage design feature endorsement training is conducted following the completion of CPL lesson 6 (for students not already holding these endorsements). Details of this training course are contained in a separate syllabus.

The privileges and limitations of the commercial pilot licence – aeroplane category rating are defined in CASR Part 61 Subpart 61.I.

Competency Standards

Practical flight competency standards

Flight training is provided to allow the student to meet the prescribed Part 61 MOS practical flight competency standards. Student performance is assessed against these flight competency standards. The standards required for the completion of this course and the issue of the licence are captured by the following units of competency:

Unit code	Unit of competency
C1	Communicating in the aviation environment
C2	Perform pre- and post-flight actions and procedures
C3	Operate aeronautical radio
C4	Manage fuel
C5	Manage passengers and cargo
NTS1	Non-technical skills 1
NTS2	Non-technical skills 2
NAV	Navigate aircraft
A1	Control aeroplane on the ground
A2	Take-off aeroplane
A3	Control aeroplane in normal flight
A4	Land aeroplane
A5	Aeroplane advanced manoeuvres
A6	Manage abnormal situations – single-engine aeroplanes
IFF	Instrument flight full panel
IFL	Limited instrument panel manoeuvres
RNE	Radio navigation – enroute
ONTA	Operate at non-towered aerodrome
OGA	Operate in Class G airspace
CTR	Operate at a controlled aerodrome
CTA	Operate in controlled airspace

Commercial Pilot Licence – Aeroplane Category Rating

SYLLABUS INTRODUCTION

Competency Standards

Aeronautical knowledge standards

The knowledge required to meet the aeronautical knowledge standards prescribed by the Part 61 MOS may be attained through student self-study or more formal training. Theory topics and content are described in the following units of knowledge:

Unit code	Unit of knowledge
CAKC	CPL Aeronautical knowledge
CAKA	CPL Aeronautical knowledge - aeroplane
CADC	CPL Aerodynamics
CADA	CPL Aerodynamics - aeroplane
CFRC	CPL Flight rules and air law
CFRA	CPL Flight rules and air law - aeroplane
CHFC	CPL Human factors
CNVC	CPL Navigation
CMTC	CPL Meteorology
COPC	CPL Ops, performance and planning
COPA	CPL Ops, performance and planning - aeroplane

Course prerequisites

This course has been developed for students who already hold a private pilot licence and aeroplane category rating. Students should have completed at least 2.3 hours of dual instrument time have logged at least 89.5 hours in command.

Students must be at least 18 years old to apply for a commercial pilot licence.

Pre-course assessment flight and course duration

The course may be undertaken on a part-time or full-time basis.

The syllabus is based on a total flight time of 46.8 hours inclusive of the CPL aeroplane category flight test; however the time required to achieve competency will vary from student to student.

Prior to commencing the course, students will undertake an assessment flight with the HOO or nominated senior instructor. A training plan will be tailored in order to meet the training needs of each student, as determined by their level of competency and prior experience. Adjustments to this syllabus will be made to meet the training plan, where required.

Course resources

Flight training is undertaken in the C150,C152 and the C172RG.

Other resources include a model aeroplane, cockpit cut-out, instrument flight hood or foggles, navigation charts and navigation equipment.

Commercial Pilot Licence – Aeroplane Category Rating

SYLLABUS INTRODUCTION

Syllabus documentation

Syllabus documentation includes:

- a planning matrix
- a lesson plan and training record for each flight.

Refer to Part 5A/Section 5.1* of the operations manual for a guide to the use of the syllabus documents.

Lesson sequence and allowable variations

The planning matrix provides the sequence of flight training lessons.

Any variations to the lesson sequence are only to be made with the prior approval of the HOO or authorising instructor.

Flight in command

The course includes 10.5 hours of command flight time.

Prior to authorising a student to conduct a solo exercise, instructors must ensure the requirements of section 3B1.1/3.4.1.1* are met. The student's flight plan and fuel calculations must be reviewed for accuracy.

Non-technical skills

Non-technical skills do not appear in the 'lesson content' section of every lesson plan and training record, however apply to every flight lesson. Instructors are to continually monitor the student's application of these skills.

Aeronautical knowledge examinations

Successful completion of the following examinations are required prior to or during the course:

Exam code	Subject	Pass standard %
CNAV	CPL Navigation	70
CMET	CPL Meteorology	70
CHUF	CPL Human factors	70
CLWA	CPL Flight rules and air law – aeroplane	80
CADA	CPL Aerodynamics – aeroplane	70
CSYA	CPL Aircraft general knowledge – aeroplane	70
CFPA	CPL Operation, performance and planning - aeroplane	70

Aeronautical knowledge examinations are conducted in the ground examination facility. Refer to Part 3E/Section 3.7* for further information regarding the conduct of these exams.

Knowledge Deficiency Report

If a student passes any of the CPLA aeronautical knowledge examinations with a score of less than 100%, a report shall be prepared about the competency standards in which the student's knowledge is deficient (a knowledge deficiency report). Following further self-study, an instructor holding a grade 1 or 2 training endorsement must orally assess the student's knowledge to ensure the deficiencies noted on the knowledge deficiency report have been addressed (i.e. knowledge corrected to 100%).

A copy of the knowledge deficiency report for each CPLA examination must be provided to the flight examiner who is to conduct the flight test.

Commercial Pilot Licence – Aeroplane Category Rating

SYLLABUS INTRODUCTION

Flight test

Upon successful completion of the course students must pass the CPL aeroplane category flight test, prior to making application for the commercial pilot licence.

The test is conducted by a flight examiner and involves a ground component and a cross-country flight of approximately 2.8 hours (2.5 hours airborne time). An assessment of general handling competencies is included in the test.

Flight test standards are contained in Schedule 5 App I.1 to the Part 61 MOS. Manoeuvres must be performed within the flight tolerances specified in table 2, Section 1 of Schedule 8 of the MOS.

For flight test procedures and information regarding the booking of flight tests, refer to section 3F1/3.8.1*.

Document control and access information

This syllabus is a managed document and is uncontrolled if printed. Refer to the version number and date in the footer to ensure that the current syllabus is being referenced.

It is available in electronic format. Paper copies are also provided for use by instructors and students.

Syllabus documentation is to be read in conjunction with Advanced aviation training's operations manual, CASR Parts 61, 141 and the Part 61 Manual of Standards.

*MAAT manual reference

Planning Matrix **Commercial Pilot Licence - Aeroplanes (non-integrated, for PPL holders) v1.0**

Performance Standards
3 = Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue
2 = Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision
1 = Achieves competency to the standard required for qualification issue.

**C150 / C152 lessons 1 to 6. C-172RG lesson 7 onwards (please see note at foot of this matrix).*

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Total hours
		General handling & circuits	General handling & BIF	Navigation exercise # 1	Navigation exercise # 2	Navigation exercise # 3- Solo	BIF& navaid training*	Navigation exercise # 4*	Navigation exercise # 5	Navigation exercise # 6 - Solo	BIF& navaid training	Navigation exercise # 7	Navigation exercise # 8	General handling - Solo	Navigation exercise #9 - Solo	Navigation exercise #10	General handling/BIF/navaid	Pre-licence	Flight Test	
	Dual day	2.0	2.0	2.5	2.5		1.7	2.5	3.0		1.8	3.0	3.5			3.5	2.5	3.0	2.8	36.3
	Solo day					2.5				3.0				1.5	3.5					10.5
	Instrument flight time		1.0		0.3		1.5	0.3	0.3		1.5		0.4			0.4	1.3	0.4	0.3	7.7
	Aeronautical knowledge examinations	CPLA Aeronautical Knowledge Examinations																		
Units, Elements and Performance Criteria																				
C1	**Communicating in the aviation environment**																			
C1.1	**Communicating face-to-face**																			
(a)	pronounces words clearly, using an accent that does not cause difficulties in understanding	2										1	1							
(b)	conveys information in clearly structured sentences without confusion or ambiguity	2										1	1							
(c)	uses an extensive vocabulary to accurately communicate on general and technical topics, without excessive use of jargon, slang or colloquial language	2										1	1							
(d)	speaks fluently without long pauses, repetition or excessive false starts	2										1	1							
(e)	responds to communications with actions that demonstrate that the information has been received and understood	2										1	1							
(f)	exchanges information clearly in a variety of situations with both expert and non-expert English speakers while giving and receiving timely and appropriate responses	2										1	1							
(g)	uses appropriate techniques to validate communications	2										1	1							
C1.2	**Operational communication using an aeronautical radio**																			
(a)	maintain effective communication with others on operational matters	2										1	1							
(b)	communicate effectively in unfamiliar, stressful or non-standard situations	2										1	1							
(c)	apply the phonetic alphabet	2										1	1							
(d)	transmit numbers	2										1	1							
(e)	make appropriate transmissions using standard aviation phraseology	2										1	1							
(f)	use plain English effectively when standard phraseology is inadequate	2										1	1							
(g)	receive appropriate responses to transmissions	2										1	1							
(h)	respond to transmissions and take appropriate action	2										1	1							
(i)	recognise and manage communication errors and misunderstandings effectively	2										1	1							
(j)	seek clarification in the time available if a message is unclear or uncertainty exists	2										1	1							
(k)	react appropriately to a variety of regional accents	2										1	1							
(l)	communicate effectively in unexpected, stressful or non-standard situations using standard phraseology or plain English	2										1	1							
C2	**Perform pre- and post-flight actions and procedures**																			
C2.1	**Pre-flight actions and procedures**																			
(a)	complete all required pre-flight administration documentation	2										1	1							
(b)	obtain, interpret and apply information contained in the required pre-flight operational documentation, including the following:																			
	(i) minimum equipment list (MEL)	2										1	1							
	(ii) maintenance release	2										1	1							
	(iii) weather forecasts	2										1	1							
	(iv) local observations	2										1	1							
	(v) Notice to Airmen (NOTAM)	2										1	1							
	(vi) global navigation satellite system (GNSS) receiver autonomous integrity monitoring (RAIM) information	2										1	1							
	(vii) En Route Supplement Australia (ERSA)	2										1	1							
	(viii) Aeronautical Information Package (AIP)	2										1	1							
(c)	identify special aerodrome procedures	2										1	1							
(d)	identify all relevant radio and navigation aid facilities to be used during the flight (if applicable)	2										1	1							
(e)	determine the suitability of the current and forecast weather conditions for the proposed flight	2										1	1							
(f)	using the aircraft documents, calculate the following for a given set of environmental and operational conditions:																			
	(i) weight and balance	2														1		1		
	(iii) take-off and landing performance	2														1		1		
	(iv) fuel requirements	2														1		1		
(g)	determine whether the aircraft is serviceable for the proposed flight	2										1	1							
C2.2	**Perform pre-flight inspection**																			
(a)	identify and secure equipment and documentation that is required for the flight	2										1	1							
(b)	complete an internal and external check of the aircraft	2										1	1							
(c)	identify all defects or damage to the aircraft	2										1	1							
(d)	report to, and seek advice from, qualified personnel to determine the action required in relation to any identified defects or damage	2										1	1							
(e)	ensure all aircraft locking and securing devices, covers and bungs are removed and stowed securely	2										1	1							
(f)	certify the aircraft flight technical log entering any defects or endorsements to permissible unserviceabilities as appropriate	2										1	1							
(g)	complete and certify the daily inspection (if authorised to do so)	2										1	1							
C2.3	**Post-flight actions and procedures**																			
(a)	shut down aircraft	2										1	1							
(b)	conduct post-flight inspection and secure the aircraft (if applicable)	2										1	1							
(c)	complete all required post-flight administration documentation	2										1	1							
C3	**Operate aeronautical radio**																			
C3.1	**Operate radio equipment**																			
(a)	confirm serviceability of radio equipment	2										1	1							
(b)	conduct transmission and receipt of radio communications using appropriate procedures and phraseology	2										1	1							
(c)	maintain a listening watch and respond appropriately to applicable transmissions	2										1	1							
(d)	conduct appropriate emergency and urgency transmissions	2										1	1							

1

Planning Matrix — Commercial Pilot Licence - Aeroplanes (non-integrated, for PPL holders) v1.0

Performance Standards
3 = Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue
2 = Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision
1 = Achieves competency to the standard required for qualification issue.

**C150 / C152 lessons 1 to 6. C-172RG lesson 7 onwards (please see note at foot of this matrix).*

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
		General handling & circuits	General handling & BIF	Navigation exercise # 1	Navigation exercise # 2	Navigation exercise # 3- Solo	BIF& navaid training*	Navigation exercise # 4*	Navigation exercise # 5	Navigation exercise # 6 - Solo	BIF& navaid training	Navigation exercise # 7	Navigation exercise # 8	General handling - Solo	Navigation exercise #9 - Solo	Navigation exercise #10	General handling/BIF/navaid	Pre-licence	Flight Test	Total hours
	Dual day	2.0	2.0	2.5	2.5		1.7	2.5	3.0		1.8	3.0	3.5			3.5	2.5	3.0	2.8	36.3
	Solo day					2.5				3.0				1.5	3.5					10.5
	Instrument flight time		1.0		0.3		1.5	0.3	0.3		1.5		0.4			0.4	1.3	0.4	0.3	7.7
	Aeronautical knowledge examinations	CPLA Aeronautical Knowledge Examinations																		
C3.2	**Manage R/T equipment malfunctions**																			
(a)	perform radio failure procedures				2							1	1							
(b)	use fault finding procedures and perform corrective actions				2							1	1							
C3.3	**Operate transponder**																			
(a)	operate a transponder during normal, abnormal and emergency operations	2										1	1							
(b)	recall transponder emergency codes	2										1	1							
C4	**Manage fuel**																			
C4.1	**Plan fuel requirements**																			
(a)	determine the required fuel reserves	2														1		1		
(b)	determine the quantity of fuel required taking into account operational requirements and relevant abnormal or emergency conditions and contingencies	2														1		1		
(c)	determine the total fuel required for the flight	2														1		1		
C4.2	**Manage fuel system**																			
(a)	verify fuel quantity on-board aircraft prior to flight using two independent methods	2														1		1		
(b)	ensure the fuel caps are secured	2														1		1		
(c)	perform fuel quality check prior to flight	2														1		1		
(d)	ensure fuel drain cocks are closed	2														1		1		
(e)	monitor fuel usage during the flight	2														1		1		
(f)	accurately maintain fuel log	2														1		1		
(g)	calculate and state endurance at any point during flight	2														1		1		
(h)	perform fuel tank changes correctly	2														1		1		
(i)	maintain fuel load within aircraft limits	2														1		1		
(j)	operate the fuel cross-feed system correctly (if fitted)	2														1		1		
(k)	operate fuel pumps and engine controls correctly	2														1		1		
(l)	configure the aircraft correctly to achieve best range performance and correctly calculate the revised range of operation				2				2				2			1		1		
(m)	configure the aircraft correctly to achieve best endurance performance and correctly calculate the revised operational endurance				2				2				2			1		1		
C4.3	**Refuel aircraft**																			
(a)	identify the correct type of fuel to be used				2							1	1							
(b)	ensure aircraft is earthed prior to refuelling and defueling operations				2							1	1							
(c)	correctly load and unload fuel				2							1	1							
(d)	ensure required fuel quantity is loaded				2							1	1							
(e)	ensure fuel caps are closed and secured after fuelling operations				2							1	1							
(f)	perform fuel quality checks				2							1	1							
C5	**Manage passengers and cargo**																			
C5.1	**Manage passengers**																			
(a)	supervise passenger safety				2											1		1		
(b)	encourage passengers to participate in and contribute to the safe outcome of the flight				2											1		1		
(c)	conduct pre-flight passenger safety briefing				2											1		1		
(d)	ensure passengers are aware of, and avoid interference with, flight and systems controls				2											1		1		
(e)	ensure passengers are aware of, and comply with, the use of seat harnesses				2											1		1		
(f)	ensure passengers are aware of the use of escape hatches, exits and emergency equipment on board the aircraft				2											1		1		
(g)	manage passenger safety in the event of abnormal or in-flight emergency situations				2											1		1		
C5.2	**Aid and assist passengers**																			
(a)	establish and maintain clear communications with passengers				2											1		1		
(b)	assist with passenger comfort both when airside and in flight				2											1		1		
C5.3	**Manage cargo**																			
(a)	manage loading, unloading and security of cargo during flight operations				2											1		1		
(b)	identify dangerous goods and apply procedures to ensure safety and security				2											1		1		
A1	**Control aeroplane on the ground**																			
A1.1	**Start and stop engine**																			
(a)	perform engine start and after start actions	2															1	1		
(b)	perform engine shutdown and after shutdown actions	2															1	1		
(c)	manage engine start and shutdown malfunctions and emergencies				2			2									1	1		
(d)	considers ground surface in relation to contamination and propeller care during engine start and stop activities	2															1	1		
A1.2	**Taxi aeroplane**																			
(a)	use aerodrome or landing area charts to taxi aircraft	2										1	1							
(b)	comply with taxiway and other aerodrome markings, right-of-way rules and ATC or marshalling instructions when applicable	2										1	1							
(c)	perform applicable taxi checks, including the following:																			
	(i) brakes and steering function normally and take appropriate action in the event of a malfunction	2										1	1							
	(ii) instruments for correct readings	2										1	1							
	(iii) altimeter setting	2										1	1							
(d)	maintain safe taxi speed and control of the aircraft	2										1	1							
(e)	maintain safe spacing from other aircraft, obstructions, and persons	2										1	1							
(f)	taxi the aeroplane along the centre of the taxiway	2										1	1							
(g)	avoid causing a hazard to other aircraft, objects or persons	2										1	1							

2

Planning Matrix **Commercial Pilot Licence - Aeroplanes (non-integrated, for PPL holders) v1.0**

Performance Standards
3 = Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue
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1 = Achieves competency to the standard required for qualification issue.

**C150 / C152 lessons 1 to 6. C-172RG lesson 7 onwards (please see note at foot of this matrix).*

		1 General handling & circuits	2 General handling & BIF	3 Navigation exercise # 1	4 Navigation exercise # 2	5 Navigation exercise # 3- Solo	6 BIF& navaid training*	7 Navigation exercise # 4*	8 Navigation exercise # 5	9 Navigation exercise # 6 - Solo	10 BIF& navaid training	11 Navigation exercise # 7	12 Navigation exercise # 8	13 General handling - Solo	14 Navigation exercise #9 - Solo	15 Navigation exercise #10	16 General handling/BIF/navaid	17 Pre-licence	18 Flight Test	Total hours
	Dual day	2.0	2.0	2.5	2.5		1.7	2.5	3.0		1.8	3.0	3.5			3.5	2.5	3.0	2.8	36.3
	Solo day					2.5				3.0				1.5	3.5					10.5
	Instrument flight time		1.0		0.3		1.5	0.3	0.3		1.5		0.4			0.4	1.3	0.4	0.3	7.7
	Aeronautical knowledge examinations	CPLA Aeronautical Knowledge Examinations																		
(h)	correct handling techniques are applied to take into account wind from all four quadrants	2									1	1								
(i)	correctly manage the engine during taxi manoeuvres	2									1	1								
A2	**Take-off aeroplane**																			
	A2.1 Carry out pre take-off procedures																			
(a)	correctly identify critical airspeeds, configurations, and emergency and abnormal procedures for normal and crosswind take-offs	2															1	1		
(b)	work out a plan of action, in advance, to ensure the safest outcome in the event of abnormal operations	2															1	1		
(c)	verify and correctly apply correction for the existing wind component to the take-off performance	2															1	1		
(d)	perform all pre take-off and line-up checks required by the aircraft checklist	2															1	1		
(e)	ensure approach path is clear of conflicting traffic and other hazards before lining up for take-off	2															1	1		
(f)	align the aeroplane on the runway centreline	2															1	1		
	A2.2 Take off aeroplane																			
(a)	apply the controls correctly to maintain longitudinal alignment on the centreline of the runway, if appropriate, prior to initiating and during the take-off	2															1	1		
(b)	adjust the power controls taking into account the existing conditions	2															1	1		
(c)	monitor power controls, settings, and instruments during take-off to ensure all predetermined parameters are achieved and maintained	2															1	1		
(d)	adjust the controls to attain the desired pitch attitude at the predetermined airspeed to attain the desired performance	2															1	1		
(e)	perform the take-off applying the required pitch, roll and yaw inputs as appropriate in a smooth, coordinated manner	2															1	1		
(f)	trim the aeroplane accurately	2															1	1		
(g)	perform gear and flap retractions, power adjustments (as applicable) and other required pilot-related activities	2															1	1		
(h)	maintain flight path along the runway extended centreline	2															1	1		
(i)	apply the applicable noise abatement and wake turbulence avoidance procedures	2															1	1		
(j)	recognise take-off abnormalities and take appropriate action to reject take-off (can be simulated)	2															1	1		
	A2.3 Take off aeroplane in a crosswind																			
(a)	perform a take-off in an aeroplane making appropriate adjustments for the crosswind conditions	2							2								1	1		
(b)	maintain the runway centreline and extended centreline	2							2								1	1		
	A2.4 Carry out after take-off procedures																			
(a)	perform after take-off checklist	2															1	1		
(b)	maintain the appropriate climb segment at the nominated heading and airspeed	2															1	1		
(c)	manoeuvre according to local and standard procedures	2															1	1		
(d)	maintain traffic separation	2															1	1		
	A2.5 Take off aeroplane from 'short field'																			
(a)	calculate take-off and landing performance in accordance with the aeroplane's performance charts	2						2					2				1	1		
(b)	perform take-off aeroplane to achieve the minimum length take-off performance	2						2					2				1	1		
(c)	perform take-off aeroplane to achieve the obstacle clearance parameters	2						2					2				1	1		
A3	**Control aeroplane in normal flight**																			
	A3.1 Climb aeroplane																			
(a)	operate and monitor all aircraft systems when commencing, during, and completing a climbing flight manoeuvre	2															1	1		
(b)	adjust altimeter subscale according to applicable settings	2															1	1		
(c)	identify and avoid terrain and traffic	2															1	1		
(d)	for the following climbing manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:																			
	(i) cruise climb	2															1	1		
	(ii) best angle climb	2															1	1		
	(iii) best rate climb	2															1	1		
(e)	anticipate level-off altitude and achieve straight and level flight	2															1	1		
	A3.2 Maintain straight and level flight																			
(a)	operate and monitor all aircraft systems during straight and level flight manoeuvres	2															1	1		
(b)	adjust altimeter subscale according to applicable settings	2															1	1		
(c)	identify and avoid terrain and traffic	2															1	1		
(d)	for the following straight and level manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:																			
	(i) at slow speed	2															1	1		
	(ii) at normal cruise	2															1	1		
	(iii) at high-speed cruise	2															1	1		
	(iv) during acceleration and deceleration	2															1	1		
	(v) at maximum range				2												1	1		
	(vi) at maximum endurance				2												1	1		
	(vii) with flaps selected	2															1	1		
	A3.3 Descend aeroplane																			
(a)	operate and monitor all aircraft systems during descending flight manoeuvres	2															1	1		
(b)	for the following descending manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:																			
	(i) glide	2															1	1		

3

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C150 / C152 lessons 1 to 6. C-172RG lesson 7 onwards (please see note at foot of this matrix).

		1 General handling & circuits	2 General handling & BIF	3 Navigation exercise # 1	4 Navigation exercise # 2	5 Navigation exercise # 3- Solo	6 BIF& navaid training*	7 Navigation exercise # 4*	8 Navigation exercise # 5	9 Navigation exercise # 6 - Solo	10 BIF& navaid training	11 Navigation exercise # 7	12 Navigation exercise # 8	13 General handling - Solo	14 Navigation exercise #9 - Solo	15 Navigation exercise #10	16 General handling/BIF/navaid	17 Pre-licence	18 Flight Test	Total hours
	Dual day	2.0	2.0	2.5	2.5		1.7	2.5	3.0		1.8	3.0	3.5			3.5	2.5	3.0	2.8	36.3
	Solo day					2.5				3.0				1.5	3.5					10.5
	Instrument flight time		1.0		0.3		1.5	0.3	0.3		1.5		0.4			0.4	1.3	0.4	0.3	7.7
	Aeronautical knowledge examinations	CPLA Aeronautical Knowledge Examinations																		
	(ii) powered	2															1	1		
	(iii) approach configuration descent (flap and undercarriage)	2															1	1		
(c)	anticipate level-off altitude and achieve straight and level flight	2															1	1		
A3.4	**Turn aeroplane**																			
(a)	operate and monitor all aircraft systems during turning flight manoeuvres	2															1	1		
(b)	for the following turning manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:																			
	(i) level turns	2															1	1		
	(ii) climbing turns	2															1	1		
	(iii) powered descending turns	2															1	1		
	(iv) gliding descending turns	2															1	1		
(c)	complete turn manoeuvre on a nominated heading or geographical feature	2															1	1		
(d)	turn aeroplane at varying rates to achieve specified tracks	2															1	1		
(e)	manoeuvre aeroplane over specified tracks or geographical features	2															1	1		
A3.5	**Control aeroplane at slow speeds**																			
(a)	complete pre-manoeuvre checks		2														1	1		
(b)	operate and monitor all aircraft systems when operating the aeroplane at slow speed		2														1	1		
(c)	for the following climbing manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:																			
	(i) minimum approach speed with flaps retracted		2														1	1		
	(ii) minimum approach speed in approach configuration		2														1	1		
(d)	observe audible and visual stall warnings and recover aeroplane to controlled flight		2														1	1		
(e)	recognise and respond positively to reduced effectiveness of controls during slow flight manoeuvres		2														1	1		
(f)	transition from slow speed configuration using take-off power to achieve nominated speed in excess of 1.5 Vs without loss of height		2														1	1		
A3.6	**Perform circuits and approaches**																			
(a)	operate and monitor all aircraft systems when operating the aeroplane in the circuit	2							2				2				1	1		
(b)	in accordance with specific local procedures, safely perform a full circuit pattern (5 legs) by balancing and trimming the aeroplane accurately while applying smooth, coordinated control inputs to achieve the required flight tolerances specified for the flight path flown during traffic pattern manoeuvres as follows:																			
	(i) track upwind along extended centreline to 500 ft	2							2				2				1	1		
	(ii) establish and maintain crosswind leg tracking 90° to the runway	2							2				2				1	1		
	(iii) establish and maintain downwind leg tracking parallel to, and at a specified distance from, the runway at circuit height	2							2				2				1	1		
	(iv) establish base leg tracking 90° to the runway at a specified distance from the runway threshold	2							2				2				1	1		
(c)	perform checks as required throughout circuit	2							2				2				1	1		
(d)	establish the approach and landing configuration appropriate for the runway and meteorological conditions, and adjust the power plant controls as required for the following:																			
	(i) commence and control approach descent path	2							2				2				1	1		
	(ii) adjust descent commencement point to take account of extended downwind leg or traffic adjustments	2							2				2				1	1		
	(iii) align and maintain aircraft on final approach flight path with specified or appropriate runway	2							2				2				1	1		
	(iv) set and maintain approach configuration not below 500 ft AGL	2							2				2				1	1		
	(v) identify and maintain the nominated aiming point	2							2				2				1	1		
	(vi) maintain a stabilised approach angle at the nominated airspeed not less than 1.3Vs to the round-out height	2							2				2				1	1		
	(vii) verify existing wind conditions, make proper correction for drift, and maintain a precise ground track	2							2				2				1	1		
	(viii) apply speed allowances for wind gusts	2							2				2				1	1		
	(ix) configure aeroplane for landing	2							2				2				1	1		
(e)	maintain aircraft separation and position in the circuit with reference to other aircraft traffic in the circuit area	2							2				2				1	1		
A3.7	**Local area airspace**																			
(a)	using an appropriate chart, for the local area and circuit area:																			
	(i) identify geographical features		2										1				1			
	(ii) identify geographical limits		2										1				1			
	(iii) identify restricted, controlled and uncontrolled airspace areas		2										1				1			
	(iv) state local airspace limits		2										1				1			
	(v) identify the transit route between the departure aerodrome and training area		2										1				1			
	(vi) identify the geographical limits of the training area		2										1				1			
	(vii) identify aerodromes and landing areas within the local area		2										1				1			
(b)	maintain orientation and pinpoint location by using geographical features and a local area chart		2										1				1			
(c)	transit from the circuit area and transit to the designated training area		2										1				1			
(d)	operate safely within a transit lane (if applicable)		2										1				1			
(e)	remain clear of restricted, controlled and other appropriately designated airspace		2										1				1			
(f)	operate safely in the vicinity of local aerodromes and landing areas		2										1				1			
(g)	transit from the designated training area to the circuit area		2										1				1			
(h)	set QNH appropriately		2										1				1			
(i)	correctly determine which runway is to be used for landing		2										1				1			
(j)	ensure runway is serviceable and available		2										1				1			
(k)	position aircraft for arrival into the circuit		2										1				1			

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**C150 / C152 lessons 1 to 6. C-172RG lesson 7 onwards (please see note at foot of this matrix).*

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
			General handling & circuits	General handling & BIF	Navigation exercise # 1	Navigation exercise # 2	Navigation exercise # 3- Solo	BIF& navaid training*	Navigation exercise # 4*	Navigation exercise # 5	Navigation exercise # 6 - Solo	BIF& navaid training	Navigation exercise # 7	Navigation exercise # 8	General handling - Solo	Navigation exercise #9 - Solo	Navigation exercise #10	General handling/BIF/navaid	Pre-licence	Flight Test	**Total hours**
		Dual day	2.0	2.0	2.5	2.5		1.7	2.5	3.0		1.8	3.0	3.5			3.5	2.5	3.0	2.8	36.3
		Solo day					2.5				3.0				1.5	3.5					10.5
		Instrument flight time		1.0		0.3		1.5	0.3	0.3		1.5		0.4			0.4	1.3	0.4	0.3	7.7
		Aeronautical knowledge examinations	CPLA Aeronautical Knowledge Examinations																		
A4		**Land aeroplane**																			
A4.1		**Land aeroplane**																			
	(a)	maintain a constant landing position aim point	2															1	1		
	(b)	achieve a smooth, positively-controlled transition from final approach to touchdown, including the following:																			
		(i) control ballooning during flare	2															1	1		
		(ii) touchdown at a controlled rate of descent, in the specified touchdown zone within tolerances	2															1	1		
		(iii) control bouncing after touchdown	2															1	1		
		(iv) touch down aligned with the centreline within tolerances	2															1	1		
	(c)	ensure separation is maintained	2															1	1		
	(d)	maintain positive directional control and crosswind correction during the after-landing roll	2															1	1		
	(e)	use drag and braking devices, as applicable, in such a manner to bring the aeroplane to a safe stop	2															1	1		
	(f)	complete the applicable after-landing checklist items in a timely manner	2															1	1		
A4.2		**Land aeroplane in a crosswind**																			
	(a)	verify existing wind conditions, make proper correction for drift, and maintain a precise ground track	2							2								1	1		
	(b)	configure the aeroplane for the crosswind conditions	2							2								1	1		
	(c)	control the aeroplane during the transition from final approach to touchdown and during after-landing roll to compensate for the crosswind conditions	2							2								1	1		
A4.3		**Conduct a missed approach**																			
	(a)	recognise the conditions when a missed approach should be executed	2							2				2				1	1		
	(b)	make the decision to execute a missed approach when it is safe to do so	2							2				2				1	1		
	(c)	make a smooth, positively-controlled transition from approach to missed approach, including the following:																			
		(i) select power, attitude and configuration to safely control aeroplane	2							2				2				1	1		
		(ii) manoeuvre aeroplane clear of the ground and conduct after take-off procedures	2							2				2				1	1		
		(iii) make allowance for wind velocity during go-around	2							2				2				1	1		
		(iv) avoid wake turbulence	2							2				2				1	1		
A4.4		**Perform recovery from missed landing**																			
	(a)	recognise when a missed landing is occurring and when it is appropriate to take recovery action	2							2				2				1	1		
	(b)	make the decision to execute recovery from a missed landing only when it is safe to do so	2							2				2				1	1		
	(c)	make a smooth, positively-controlled transition from a missed landing to missed approach, including the following:																			
		(i) select power, attitude and configuration to safely control aeroplane	2							2				2				1	1		
		(ii) manoeuvre aeroplane clear of the ground and conduct after take-off procedures	2							2				2				1	1		
		(iii) make allowance for wind velocity during go-around	2							2				2				1	1		
		(iv) avoid wake turbulence	2							2				2				1	1		
A4.5		**Short landing**																			
	(a)	land aeroplane at nominated touchdown point at minimum speed	2			2			2					2				1	1		
	(b)	control ballooning during flare	2			2			2					2				1	1		
	(c)	control bouncing after touchdown	2			2			2					2				1	1		
	(d)	maintain direction after touchdown	2			2			2					2				1	1		
	(e)	apply maximum braking without locking up wheels	2			2			2					2				1	1		
	(f)	stops aircraft within landing distance available	2			2			2					2				1	1		
A5		**Aeroplane advanced manoeuvres**																			
A5.1		**Enter and recover from stall**																			
	(a)	perform pre-manoeuvre checks for stalling		2		2			2				2				1	1			
	(b)	recognise stall signs and symptoms		2		2			2				2				1	1			
	(c)	control the aeroplane by applying the required pitch, roll and yaw inputs as appropriate in a smooth, coordinated manner, trim aeroplane accurately to enter and recover from the following manoeuvres:																			
		(i) incipient stall		2		2							2				1	1			
		(ii) stall with full power applied		2		2							2				1	1			
		(iii) stall without power applied		2					2				2				1	1			
		(iv) stall under the following conditions:											2				1	1			
		(A) straight and level flight		2		2							2				1	1			
		(B) climbing		2		2							2				1	1			
		(C) descending		2					2				2				1	1			
		(D) approach to land configuration		2					2				2				1	1			
		(E) turning		2					2				2				1	1			
	(d)	perform stall recovery as follows:																			
		(i) positively reduce angle of attack		2		2			2				2				1	1			
		(ii) use power available and excess height to increase the aircraft energy state		2		2			2				2				1	1			
		(iii) minimise height loss for simulated low altitude condition		2		2			2				2				1	1			
		(iv) re-establish desired flight path and aircraft control		2		2			2				2				1	1			
	(e)	recover from stall in simulated partial and complete engine failure configurations		2					2				2				1	1			
A5.2		**Recover from incipient spin**																			
	(a)	perform pre-manoeuvre checks for an incipient spin		2		2			2				2				1	1			
	(b)	recognise an incipient spin		2		2			2				2				1	1			
	(c)	use the aeroplane's attitude and power controls to execute an incipient spin manoeuvre from the following flight conditions and, using correct recovery technique, regain straight and level flight with height loss commensurate with the available altitude (simulated ground base height may be set):																			
		(i) straight and level flight		2		2							2				1	1			

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		1 General handling & circuits	2 General handling & BIF	3 Navigation exercise # 1	4 Navigation exercise # 2	5 Navigation exercise # 3- Solo	6 BIF& navaid training*	7 Navigation exercise # 4*	8 Navigation exercise # 5	9 Navigation exercise # 6 - Solo	10 BIF& navaid training	11 Navigation exercise # 7	12 Navigation exercise # 8	13 General handling - Solo	14 Navigation exercise #9 - Solo	15 Navigation exercise #10	16 General handling/BIF/navaid	17 Pre-licence	18 Flight Test	Total hours
	Dual day	2.0	2.0	2.5	2.5		1.7	2.5	3.0		1.8	3.0	3.5			3.5	2.5	3.0	2.8	36.3
	Solo day					2.5				3.0				1.5	3.5					10.5
	Instrument flight time		1.0		0.3		1.5	0.3	0.3		1.5		0.4			0.4	1.3	0.4	0.3	7.7
	Aeronautical knowledge examinations	CPLA Aeronautical Knowledge Examinations																		
	(ii) climbing		2					2				2				1	1			
	(iii) turning		2					2				2				1	1			
A5.3	**Turn aeroplane steeply**																			
(a)	pre-manoeuvre checks for steep turning	2		2					2				2			1	1			
(b)	steep level turn using a nominated bank angle, ending on a nominated heading or geographical feature, without altitude change	2		2					2				2			1	1			
(c)	steep descending turn using a nominated bank angle, ending on a nominated heading or geographical feature ending on a nominated altitude	2							2				2			1	1			
(d)	aeroplane operating limits are not exceeded	2		2					2				2			1	1			
A5.4	**Sideslip aeroplane (where flight manual permits)**																			
(a)	straight sideslip:																			
	(i) induce slip to achieve increased rate of descent while maintaining track and airspeed	2		2									2			1	1			
	(ii) adjust rate of descent by coordinating angle of bank and applied rudder	2		2									2			1	1			
(b)	sideslipping turn by adjusting the bank angle to turn through minimum heading change of 90° at constant airspeed using sideslip, and exiting the turn on a specified heading or geographical feature, within tolerance	2											2			1	1			
(c)	recover from a sideslip and return the aeroplane to balanced flight	2		2									2			1	1			
A6	**Manage abnormal situations – single-engine aeroplanes**																			
A6.1	**Manage engine failure - take-off (simulated)**																			
(a)	correctly identify an engine failure after take-off			2	2								2				1	1		
(b)	apply the highest priority to taking action to control the aeroplane			2	2								2				1	1		
(c)	maintain control of the aeroplane			2	2								2				1	1		
(d)	perform recall actions			2	2								2				1	1		
(e)	perform emergency actions as far as time permits			2	2								2				1	1		
(f)	manoeuvre the aeroplane to achieve the safest possible outcome			2	2								2				1	1		
(g)	ensure passengers adopt brace position			2	2								2				1	1		
(h)	advise others such as ATS and other aircraft of intentions if time permits			2	2								2				1	1		
A6.2	**Manage engine failure in the circuit area (simulated)**																			
(a)	correctly identify an engine failure during flight			2	2				2				2				1	1		
(b)	apply the highest priority to taking action to control the aeroplane			2	2				2				2				1	1		
(c)	perform recall actions			2	2				2				2				1	1		
(d)	select a suitable landing area within gliding distance, on the aerodrome or elsewhere			2	2				2				2				1	1		
(e)	perform emergency procedures and land the aeroplane if the engine cannot be restarted as time permits			2	2				2				2				1	1		
(f)	advise ATS or other agencies capable of providing assistance of situation and intentions			2	2				2				2				1	1		
(g)	re-brief passengers about flight situation, brace position and harness security			2	2				2				2				1	1		
(h)	land the aeroplane ensuring safest outcome if an engine restart is not achieved			2	2				2				2				1	1		
A6.3	**Perform forced landing (simulated)**																			
(a)	after a simulated complete engine failure has occurred, without prior indications, carry out the following:																			
	(i) identify complete power failure condition and control aeroplane	2		2					2				2			1		1		
	(ii) perform immediate actions	2		2					2				2			1		1		
	(iii) formulate and describe a recovery plan, including selecting the most suitable landing area	2		2					2				2			1		1		
	(iv) establish optimal gliding flight path to position the aeroplane for a landing on the selected landing area	2		2					2				2			1		1		
	(v) perform emergency procedures and land the aeroplane if the engine cannot be restarted as time permits	2		2					2				2			1		1		
	(vi) advise ATS or other agencies capable of providing assistance of situation and intentions	2		2					2				2			1		1		
	(vii) re-brief passengers about flight situation, brace position and harness security	2		2					2				2			1		1		
	(viii) land the aeroplane ensuring safest outcome if an engine restart is not achieved	2		2					2				2			1		1		
(b)	after a simulated partial engine failure has occurred, without prior indications, carry out the following:																			
	(i) identify partial power failure condition		2		2							2				1		1		
	(ii) perform recall actions		2		2							2				1		1		
	(iii) adjust flight controls to re-establish flight path that maximises performance for partial power condition and maintain a safe airspeed margin above stall speed		2		2							2				1		1		
	(iv) establish radio communications where possible		2		2							2				1		1		
	(v) perform partial engine failure actions		2		2							2				1		1		
	(vi) formulate a plan to recover aeroplane to a safe landing area or aerodrome, taking into account that partial failure might lead to a full power failure at any time		2		2							2				1		1		
	(vii) manoeuvre the aeroplane to a selected landing area or aerodrome using the remaining power to establish an optimal aircraft position for a safe landing		2		2							2				1		1		
	(viii) advise ATS or other agencies capable of providing assistance of situation and intentions		2		2							2				1		1		
	(ix) re-brief passengers about flight situation, brace position and harness security		2		2							2				1		1		
	(x) maintain a contingency plan for coping with a full power failure throughout the manoeuvre		2		2							2				1		1		
	(xi) when a safe landing position is established, shut down and secure engine and aeroplane		2		2							2				1		1		
A6.4	**Conduct precautionary search and landing (simulated condition)**																			
(a)	assess flight circumstances and make an appropriate decision when to perform precautionary landing		2		2			2				2				1	1			
(b)	configure aeroplane for conditions		2		2			2				2				1	1			
(c)	perform precautionary search procedure		2		2			2				2				1	1			
(d)	select landing area, carry out an inspection and assess its suitability for landing, taking into account:																			
	(i) unobstructed approach and overshoot paths		2		2			2				2				1	1			
	(ii) landing area length adequate for landing		2		2			2				2				1	1			

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**C150 / C152 lessons 1 to 6. C-172RG lesson 7 onwards (please see note at foot of this matrix).*

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	Dual day	2.0	2.0	2.5	2.5		1.7	2.5	3.0		1.8	3.0	3.5			3.5	2.5	3.0	2.8	36.3
	Solo day					2.5				3.0				1.5	3.5					10.5
	Instrument flight time		1.0		0.3		1.5	0.3	0.3		1.5		0.4			0.4	1.3	0.4	0.3	7.7
	Aeronautical knowledge examinations	CPLA Aeronautical Knowledge Examinations																		
	(iii) landing area surface is suitable for aeroplane type and clear of hazards		2		2			2				2				1	1			
(e)	maintain orientation and visual contact with the landing area		2		2			2				2				1	1			
(f)	advise ATS or other agencies capable of providing assistance of situation and intentions		2		2			2				2				1	1			
(g)	re-brief passengers about flight situation, brace position and harness security		2		2			2				2				1	1			
(h)	land and secure aircraft and manage passengers		2		2			2				2				1	1			
A6.5	**Manage other abnormal situations (simulated)**																			
(a)	correctly identify the situation and maintain safe control of the aeroplane at all times				2		2		2			2				1		1		
(b)	manage abnormal and emergency situations in accordance with relevant emergency procedures and regulatory requirements				2		2		2			2				1		1		
(c)	follow appropriate emergency procedures while maintaining control of the aeroplane				2		2		2			2				1		1		
(d)	identify and conduct flight with an unreliable airspeed indication						2					2				1		1		
(e)	correctly identify when an emergency evacuation of an aeroplane is required				2		2		2			2				1		1		
(f)	execute a simulated emergency evacuation of an aeroplane				2		2		2			2				1		1		
(g)	advise ATS or other agencies capable of providing assistance of situation and intentions				2		2		2			2				1		1		
A6.6	**Recover from unusual flight attitudes**																			
(a)	identify nose-high or nose-low unusual attitude flight condition	2	2									2				1	1			
(b)	recover from nose-low or nose-high unusual attitudes by adjusting pitch, bank and power to resume controlled and balanced flight	2	2									2				1	1			
(c)	apply controlled corrective action while maintaining aircraft performance within limits	2	2									2				1	1			
IFF	**Full instrument panel manoeuvres**																			
IFF.1	**Determine and monitor the serviceability of flight instruments and instrument power sources**																			
(a)	determine serviceability of flight and navigational instruments		2				2		2		2		2				1	1		
(b)	perform functional checks of flight and navigational instruments where applicable prior to take-off		2				2		2		2		2				1	1		
(c)	monitor flight instrument and instrument power sources and react to any warnings, unserviceability or erroneous indications		2				2		2		2		2				1	1		
IFF.2	**Perform manoeuvres using full instrument panel**																			
(a)	interpret flight instrument indications and apply procedures and techniques to achieve and maintain a specified flight path using the aircraft's full instrument panel		2				2		2		2		2				1	1		
(b)	set and maintain power and attitude by reference to the full instrument panel to achieve the following:																			
	(i) straight and level performance during normal cruise within the flight tolerances		2				2		2		2		2				1	1		
	(ii) nominated climb performance within the flight tolerances		2				2		2		2		2				1	1		
	(iii) descent performance within the flight tolerances		2				2		2		2		2				1	1		
(c)	set and maintain power and attitude by reference to the full instrument panel to establish a rate 1 turn onto a nominated heading within the flight tolerances		2				2		2		2		2				1	1		
IFF.3	**Recover from upset situations and unusual attitudes**																			
(a)	correctly identify upset situations and unusual attitudes under simulated IMC		2				2		2		2		2				1	1		
(b)	recover to controlled flight from upset situations and unusual attitudes under simulated IMC from any combination of the following aircraft states:																			
	(i) high and low-nose attitudes		2				2		2		2		2				1	1		
	(ii) varying angles of bank		2				2		2		2		2				1	1		
	(iii) various power settings		2				2		2		2		2				1	1		
	(iv) various aircraft configurations		2				2		2		2		2				1	1		
	(v) unbalanced flight		2				2		2		2		2				1	1		
IFL	**Limited instrument panel manoeuvres**																			
IFL.1	**Recognise failure of attitude indicator and stabilised heading indicator**																			
(a)	monitor flight instruments and instrument power sources and recognise warning indicators or erroneous instrument indications		3				3				2		2				1	1		
(b)	transition from a full instrument panel to a limited instrument panel		3				3				2		2				1	1		
IFL.2	**Perform manoeuvres – limited panel**																			
(a)	interpret and respond appropriately to instrument indications		3				3				2		2				1	1		
(b)	apply power and attitude settings to achieve straight and level performance during:																			
	(i) normal cruise		3				3				2		2				1	1		
	(ii) approach configuration with flaps (when fitted) and undercarriage down		3				3				2		2				1	1		
(c)	apply power and attitude settings to achieve:																			
	(i) nominated climb performance		3				3				2		2				1	1		
	(ii) nominated descent performance		3				3				2		2				1	1		
	(iii) during climb, descent and straight and level flight, rate 1 turns onto a nominated heading		3				3				2		2				1	1		
(d)	trim (as applicable) and balance aircraft		3				3				2		2				1	1		
(e)	establish level flight at a nominated altitude, from a climb or descent during straight or turning flight		3				3				2		2				1	1		
IFL.3	**Recover from upset situations and unusual attitudes – limited panel**																			
(a)	correctly identify upset situations and unusual attitudes under simulated IMC		3				3				2		2				1	1		
(b)	recover to stabilised straight and level flight using approved techniques from upset situations and unusual attitudes under simulated IMC from any combination of the following aircraft states:																			
	(i) high and low-nose attitudes		3				3				2		2				1	1		
	(ii) varying angles of bank		3				3				2		2				1	1		
	(iii) various power settings		3				3				2		2				1	1		
	(iv) various aircraft configurations		3				3				2		2				1	1		
	(v) unbalanced flight		3				3				2		2				1	1		
IFL.4	**Re-establish visual flight**																			
(a)	transition from visual flight conditions to instrument flight conditions while maintaining control of the		3		3		3				2		2				1	1		

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		1 General handling & circuits	2 General handling & BIF	3 Navigation exercise # 1	4 Navigation exercise # 2	5 Navigation exercise # 3- Solo	6 BIF& navaid training*	7 Navigation exercise # 4*	8 Navigation exercise # 5	9 Navigation exercise # 6 - Solo	10 BIF& navaid training	11 Navigation exercise # 7	12 Navigation exercise # 8	13 General handling - Solo	14 Navigation exercise #9 - Solo	15 Navigation exercise #10	16 General handling/BIF/navaid	17 Pre-licence	18 Flight Test	Total hours
	Dual day	2.0	2.0	2.5	2.5		1.7	2.5	3.0		1.8	3.0	3.5			3.5	2.5	3.0	2.8	36.3
	Solo day					2.5				3.0				1.5	3.5					10.5
	Instrument flight time		1.0		0.3		1.5	0.3	0.3		1.5		0.4			0.4	1.3	0.4	0.3	7.7
	Aeronautical knowledge examinations	CPLA Aeronautical Knowledge Examinations																		
	aircraft																			
(b)	perform a manoeuvre to re-establish visual flight		3		3		3				2		2				1	1		
(c)	implement a plan that ensures the flight continues in VMC		3		3		3				2		2				1	1		
NTS1	**Non-technical skills 1**																			
NTS1.1	**Maintain effective lookout**																			
(a)	maintain traffic separation using a systematic visual scan technique at a rate determined by traffic density, visibility and terrain				1												1			
(b)	maintain radio listening watch and interpret transmissions to determine traffic location and intentions				1												1			
(c)	perform airspace-cleared procedure before commencing any manoeuvre				1												1			
NTS1.2	**Maintain situational awareness**																			
(a)	monitor all aircraft systems using a systematic scan technique				2												1	1		
(b)	collect information to facilitate ongoing system management				2												1	1		
(c)	monitor flight environment for deviations from planned operations				2												1	1		
(d)	collect flight environment information to update planned operations				2												1	1		
NTS1.3	**Assess situations and make decisions**																			
(a)	identify problems				2												1	1		
(b)	analyse problems				2												1	1		
(c)	identify solutions				2												1	1		
(d)	assess solutions and risks				2												1	1		
(e)	decide on a course of action				2												1	1		
(f)	communicate plans of action (if appropriate)				2												1	1		
(g)	allocate tasks for action (if appropriate)				2												1	1		
(h)	take actions to achieve optimum outcomes for the operation				2												1	1		
(i)	monitor progress against plan				2												1	1		
(j)	re-evaluate plan to achieve optimum outcomes				2												1	1		
NTS1.4	**Set priorities and manage tasks**																			
(a)	organise workload and priorities to ensure optimum outcome of the flight				2												1	1		
(b)	plan events and tasks to occur sequentially				2												1	1		
(c)	anticipate events and tasks to ensure sufficient opportunity for completion				2												1	1		
(d)	use technology to reduce workload and improve cognitive and manipulative activities				2												1	1		
NTS1.5	**Maintain effective communications and interpersonal relationships**																			
(a)	establish and maintain effective and efficient communications and interpersonal relationships with all stakeholders to ensure the optimum outcome of the flight				2												1	1		
(b)	define and explain objectives to stakeholders				2												1	1		
(c)	demonstrate a level of assertiveness that ensures the optimum completion of the flight				2												1	1		
NTS2	**Non-technical skills 2**																			
NTS2.1	**Recognise and manage threats**																			
(a)	identify relevant environmental or operational threats that are likely to affect the safety of the flight				2												1	1		
(b)	identify when competing priorities and demands may represent a threat to the safety of the flight				2												1	1		
(c)	develop and implement countermeasures to manage threats				2												1	1		
(d)	monitor and assess flight progress to ensure a safe outcome, or modify actions when a safe outcome is not assured				2												1	1		
NTS2.2	**Recognise and manage errors**																			
(a)	apply checklists and standard operating procedures to prevent aircraft handling, procedural or communication errors				2												1	1		
(b)	identify committed errors before safety is affected or the aircraft enters an undesired state				2												1	1		
(c)	monitor the following to collect and analyse information to identify potential or actual errors:																			
	(i) aircraft systems using a systematic scan technique				2												1	1		
	(ii) the flight environment				2												1	1		
	(iii) other crew				2												1	1		
(d)	implement countermeasures to prevent errors or take action in the time available to correct errors before the aircraft enters an undesired state				2												1	1		
NTS2.3	**Recognise and manage undesired aircraft state**																			
(a)	recognise an undesired aircraft state				2												1	1		
(b)	prioritise tasks to ensure an undesired aircraft state is managed effectively				2												1	1		
(c)	apply corrective actions to recover an undesired aircraft state in a safe and timely manner				2												1	1		
NAV	**Navigate aircraft**																			
NAV.1	**Prepare documents and flight plan**																			
(a)	select and prepare appropriate navigation charts for the intended flight			2												1		1		
(b)	select a suitable route and altitude considering weather, terrain, airspace, NOTAMs and alternate landing areas			2												1		1		
(c)	obtain and interpret meteorological forecasts, NOTAMs and operational information applicable to the planned flight			2												1		1		
(d)	determine whether the planned flight can be conducted under the applicable flight rules and taking account of the beginning and end of daylight times			2												1		1		
(e)	calculate and document critical point (CP) and point of no return (PNR) locations				3			3	2			2	2			1		1		
(f)	complete a flight plan to the planned destination and alternates			2												1		1		
(g)	lodge suitable flight notification for search and rescue (SAR) purposes			2												1		1		
NAV.2	**Comply with airspace procedures while navigating**																			
(a)	identify airspace restrictions and dimensions applicable to the flight			2												1		1		
(b)	obtain and comply with air traffic clearances, if applicable			2												1		1		

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		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Total hours
		General handling & circuits	General handling & BIF	Navigation exercise # 1	Navigation exercise # 2	Navigation exercise # 3- Solo	BIF& navaid training*	Navigation exercise # 4*	Navigation exercise # 5	Navigation exercise # 6 - Solo	BIF& navaid training	Navigation exercise # 7	Navigation exercise # 8	General handling - Solo	Navigation exercise #9 - Solo	Navigation exercise #10	General handling/BIF/navaid	Pre-licence	Flight Test	
	Dual day	2.0	2.0	2.5	2.5		1.7	2.5	3.0		1.8	3.0	3.5			3.5	2.5	3.0	2.8	36.3
	Solo day					2.5				3.0				1.5	3.5					10.5
	Instrument flight time		1.0		0.3		1.5	0.3	0.3		1.5		0.4			0.4	1.3	0.4	0.3	7.7
	Aeronautical knowledge examinations	CPLA Aeronautical Knowledge Examinations																		
(c)	comply with airspace procedures applicable to the airspace classification throughout the flight			2												1		1		
NAV.3	**Conduct departure procedures**																			
(a)	organise cockpit to ensure charts, documentation and navigational calculator are accessible from the control seat			2												1		1		
(b)	comply with all departure procedures, clearances and noise abatement requirements			2												1		1		
(c)	establish planned track on departure within 5 nm of airfield or apply alternative procedure if required			2												1		1		
(d)	calculate estimated time of arrival (ETA) for first waypoint			2												1		1		
NAV.4	**Navigate aircraft enroute**																			
(a)	maintain a navigation cycle that ensures accurate tracking, and apply track correctional techniques to re-establish track prior to waypoint or destination			2												1		1		
(b)	maintain heading to achieve a nominated track			2												1		1		
(c)	maintain and revise ETAs (±2 minutes) for waypoint or destination			2												1		1		
(d)	maintain track in accordance with published flight path tolerances in controlled airspace			2												1		1		
(e)	navigate using accepted map-reading techniques			2												1		1		
(f)	maintain navigation and fuel log to monitor tracking, ETAs and fuel status			2												1		1		
(g)	use appropriate techniques to obtain a positive fix at suitable intervals			2												1		1		
(h)	maintain awareness of route, enroute terrain, enroute and destination weather, and react appropriately to changing weather conditions			2												1		1		
(i)	perform pre-descent and turning point checks			2												1		1		
(j)	maintain appropriate radio communication and listening watch with ATS and other aircraft if radio is fitted and used			2												1		1		
(k)	configure the aircraft as required for the following environmental and operational conditions:																			
	(i) turbulence				2											1		1		
	(ii) holding				2											1		1		
	(iii) maximum range				2											1		1		
(l)	maintain awareness of search and rescue times (SARTIME) and revise as required			2												1		1		
(m)	monitor aircraft systems, manage fuel and engine to ensure aircraft is operated to achieve flight plan objectives			2												1		1		
NAV.5	**Navigate at low level and in reduced visibility**																			
(a)	configure the aircraft as required for the following environmental and operational conditions:																			
	(i) reduced visibility				2				2			2				1		1		
	(ii) low cloud base				2				2			2				1		1		
(b)	navigate aeroplane at minimum heights (not below 500 ft AGL, clear of built-up areas) and remain in VMC				2				2			2				1		1		
(c)	maintain separation from terrain, obstacles, allowing for wind and turbulence at low level				2				2			2				1		1		
(d)	avoid noise sensitive areas				2				2			2				1		1		
(e)	operate appropriately in the vicinity of aerodromes and landing areas				2				2			2				1		1		
NAV.6	**Perform lost procedure**																			
(a)	acknowledge positional uncertainty in a timely manner				2			2					2			1		1		
(b)	configure aircraft for range and endurance as required				2			2					2			1		1		
(c)	apply recognised method to re-establish aircraft position				2			2					2			1		1		
(d)	fix position				2			2					2			1		1		
(e)	use radio to request assistance, if applicable				2			2					2			1		1		
(f)	plan a timely precautionary search and landing if unable to complete flight safely to suitable aerodrome				2			2					2			1		1		
NAV.7	**Perform diversion procedure**																			
(a)	make timely decision to divert				2				2			2				1		1		
(b)	identify an acceptable alternate aerodrome				2				2			2				1		1		
(c)	select a suitable route and cruising level				2				2			2				1		1		
(d)	revise flight plan considering weather, terrain, airspace and fuel available				2				2			2				1		1		
(e)	advise ATS of an intention to divert				2				2			2				1		1		
NAV.8	**Use instrument navigation systems**																			
(a)	initialise navigation system (as applicable)								2							1		1		
(b)	conduct navigation system validity check (as applicable)								2							1		1		
(c)	conduct RAIM check if required								2							1		1		
(d)	select, load, check and activate the flight plan (as applicable)								2							1		1		
(e)	navigate on departure, enroute and on arrival using GNSS								2							1		1		
(f)	operate instrument navigation systems correctly								2							1		1		
(g)	use instrument navigation systems to assist with navigation								2							1		1		
(h)	confirm waypoints and fixes using instrument navigation systems								2							1		1		
NAV.9	**Execute arrival procedures**																			
(a)	obtain updated relevant aerodrome information			2												1		1		
(b)	determine landing direction and aerodrome suitability			2												1		1		
(c)	conduct arrival			2												1		1		
(d)	identify and avoid all traffic			2												1		1		
(e)	observe local and published noise abatement requirements and curfews			2												1		1		
(f)	cancel SARWATCH			2												1		1		
RNE	**Radio navigation – enroute**																			
RNE.1	**Operate and monitor radio navigation aids and systems**																			
(a)	select and operate navigation aids and systems						2		2		2						1	1		
(b)	monitor and take appropriate action in relation to the integrity of navigation aid systems information						2		2		2						1	1		

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	Solo day					2.5				3.0				1.5	3.5					10.5
	Instrument flight time		1.0		0.3		1.5	0.3	0.3		1.5		0.4			0.4	1.3	0.4	0.3	7.7
	Aeronautical knowledge examinations	CPLA Aeronautical Knowledge Examinations																		
RNE.2	**Navigate the aircraft using navigation aids and systems**																			
(a)	determine aircraft position fix solely with reference to navigation aids and systems						2		2		2						1	1		
(b)	intercept tracks to and from navigation aids and systems						2		2		2						1	1		
(c)	maintain tracks within specified tolerances						2		2		2						1	1		
(d)	record, assess and revise timings as required								2								1	1		
(e)	recognise station passage						2		2		2						1	1		
ONTA	**Operate at non-towered aerodromes**																			
ONTA.1	**Non-towered aerodrome – pre-flight preparation**																			
(a)	using a current ERSA and NOTAM, for the non-towered aerodrome or landing area, extract all of the relevant operational information			2												1		1		
(b)	interpret the extracted information			2												1		1		
(c)	identify all special aerodrome procedures			2												1		1		
(d)	check current weather forecast and local observations			2												1		1		
(e)	identify all relevant radio and navigation aid frequencies			2												1		1		
ONTA.2	**Taxi aircraft at a non-towered aerodrome or landing area**																			
(a)	refer to aerodrome or landing area chart (if available)			2												1		1		
(b)	set local QNH or area QNH			2												1		1		
(c)	broadcast intentions on appropriate frequency			2												1		1		
(d)	obtain and interpret traffic information			2												1		1		
(e)	maintain lookout for, and separation from, other aircraft, wildlife and other obstructions			2												1		1		
(f)	recognise ground markings during taxi and take appropriate action			2												1		1		
(h)	taxi aircraft to holding point			2												1		1		
(i)	use strobes when crossing any runway			2												1		1		
ONTA.3	**Perform departure at a non-towered aerodrome or landing area**																			
(a)	check and ensure runway approach is clear prior to entering a runway			2												1		1		
(b)	correctly set transponder code and mode prior to entering runway for take-off			2												1		1		
(c)	confirm runway approaches clear in all directions prior to entering runway			2												1		1		
(d)	broadcast line up details			2												1		1		
(f)	transmit appropriate radio calls and maintain separation with other aircraft			2												1		1		
(g)	advise air service provider of departure details, if required			2												1		1		
(h)	conduct departure			2												1		1		
ONTA.4	**Perform arrival and landing at a non-towered aerodrome or landing area**																			
(a)	check ERSA and NOTAM prior to entering circuit area			2												1		1		
(b)	set correct area or local QNH			2												1		1		
(c)	use correct radio frequency to transmit inbound calls as required			2												1		1		
(d)	maintain effective lookout			2												1		1		
(e)	maintain aircraft separation and avoid other traffic			2												1		1		
(f)	maintain tracking tolerances			2												1		1		
(g)	determine wind velocity			2												1		1		
(h)	determine landing direction			2												1		1		
(i)	confirm runway is serviceable for the operation			2												1		1		
(j)	determine circuit direction			2												1		1		
(k)	conduct landing area inspection (if applicable)			2												1		1		
(l)	position aircraft in the circuit in preparation for landing and maintain separation from traffic			2												1		1		
(m)	make all necessary circuit radio calls			2												1		1		
(n)	verify runway is clear of other traffic, wildlife and other obstructions			2												1		1		
(o)	land the aircraft			2												1		1		
(p)	vacate runway			2												1		1		
(q)	cancel SARWATCH, if applicable			2												1		1		
OGA	**Operate in Class G airspace**																			
OGA	**Operate aircraft in Class G airspace**																			
(a)	maintain tracking and altitude tolerances to remain outside controlled airspace			2												1		1		
(b)	apply separation tolerances between IFR flights, and IFR and VFR flights			2												1		1		
(c)	when using an aircraft radio:																			
	(i) monitor appropriate radio frequency			2												1		1		
	(ii) make appropriate radio calls			2												1		1		
	(iii) obtain operational information from air services provider and other aircraft			2												1		1		
	(iv) use information to ensure aircraft separation is maintained			2												1		1		
	(v) apply loss of radio communication procedures				2											1		1		
(d)	using a suitable chart:																			
	(i) operate clear of active aerodromes and landing areas in the vicinity of the aircraft			2												1		1		
	(ii) identify and remain clear of controlled and restricted airspace			2												1		1		
	(iii) take appropriate action when operating in the vicinity of a danger area			2												1		1		
(e)	perform actions in the event of abnormal operations and emergencies			2												1		1		
(f)	recall transponder emergency code and communication failure code			2												1		1		
CTR	**Operate at a controlled aerodrome**																			
CTR.1	**Controlled aerodrome pre-flight preparation**																			
(a)	using a current ERSA and NOTAM, for the controlled aerodrome, extract all the relevant operational information				2											1		1		

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Planning Matrix **Commercial Pilot Licence - Aeroplanes (non-integrated, for PPL holders) v1.0**

Performance Standards
3 = Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue
2 = Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision
1 = Achieves competency to the standard required for qualification issue.

**C150 / C152 lessons 1 to 6. C-172RG lesson 7 onwards (please see note at foot of this matrix).*

		1 General handling & circuits	2 General handling & BIF	3 Navigation exercise # 1	4 Navigation exercise # 2	5 Navigation exercise # 3- Solo	6 BIF& navaid training*	7 Navigation exercise # 4*	8 Navigation exercise # 5	9 Navigation exercise # 6 - Solo	10 BIF& navaid training	11 Navigation exercise # 7	12 Navigation exercise # 8	13 General handling - Solo	14 Navigation exercise #9 - Solo	15 Navigation exercise #10	16 General handling/BIF/navaid	17 Pre-licence	18 Flight Test	Total hours
	Dual day	2.0	2.0	2.5	2.5		1.7	2.5	3.0		1.8	3.0	3.5			3.5	2.5	3.0	2.8	36.3
	Solo day					2.5				3.0				1.5	3.5					10.5
	Instrument flight time		1.0		0.3		1.5	0.3	0.3		1.5		0.4			0.4	1.3	0.4	0.3	7.7
	Aeronautical knowledge examinations	CPLA Aeronautical Knowledge Examinations																		
(b)	interpret the extracted information				2											1		1		
(c)	identify all special aerodrome procedures				2											1		1		
(d)	check current weather forecast and local observations				2											1		1		
(e)	identify all relevant radio and navigation aid frequencies				2											1		1		
CTR.2	**Taxi aircraft at a controlled aerodrome**																			
(a)	obtain and comply with ATC clearances				2											1		1		
(b)	manoeuvre aircraft to holding point as instructed and take appropriate action to avoid other aircraft and obstructions				2											1		1		
(c)	recognise ground markings during taxi and take appropriate action				2											1		1		
(d)	recognise lighting signals and take appropriate action				2											1		1		
(e)	identify airport runway incursion hotspots				2											1		1		
(f)	manoeuvre aircraft to avoid jet blast hazard				2											1		1		
(g)	request taxi guidance if unsure of position				2											1		1		
(h)	use strobes when crossing any runway				2											1		1		
CTR.3	**Perform departure from controlled aerodrome**																			
(a)	receive and correctly read back an airways clearance				2											1		1		
(b)	check and ensure runway approach is clear prior to entering a runway				2											1		1		
(c)	correctly set transponder code and mode prior to entering runway for take-off				2											1		1		
(d)	comply with ATC departure instructions				2											1		1		
(e)	advise ATC as soon as possible if unable to comply with clearance				2											1		1		
(f)	contact approach with airborne report or give departure call to tower				2											1		1		
(g)	maintain lookout				2											1		1		
(h)	avoid wake turbulence				2											1		1		
(i)	comply with airways clearances within tracking and altitude tolerances and maintain traffic lookout until clear of the aerodrome control zone				2											1		1		
CTR.4	**Perform arrival and landing at controlled aerodrome**																			
(a)	check ERSA and NOTAM prior to entering control area and extract required operational information				2											1		1		
(b)	receive ATIS and correctly set the appropriate QNH				2											1		1		
(c)	request and receive ATC clearance and set correct transponder code prior to entering control area				2											1		1		
(d)	advise ATC as soon as possible if unable to comply with clearance				2											1		1		
(e)	maintain lookout at all times				2											1		1		
(f)	update QNH as required				2											1		1		
(g)	maintain tracking tolerances				2											1		1		
(h)	establish aircraft on the correct leg of the circuit in preparation for landing and maintain separation from traffic				2											1		1		
(i)	confirm clearance to land				2											1		1		
(j)	vacate runway and obtain taxi clearance				2											1		1		
CTA	**Operate in controlled airspace**																			
CTA.1	**Operate aircraft in controlled airspace**																			
(a)	comply with airways clearance requirements for operating in all classes of airspace, including lead time required for flight plan submission, contents, 'clearance void time', and 'readback' requirement				2											1		1		
(b)	apply airways clearance requirements for entering, operating in and departing from CTA and CTR, including details that need to be provided to ATC, and what details to expect from ATC				2											1		1		
(c)	maintain control area protection tolerances				2											1		1		
(d)	maintain tracking and altitude tolerances when operating on an airways clearance				2											1		1		
(e)	reconfirm any clearance items when doubt exists				2											1		1		
(f)	advise ATC as soon as possible if unable to maintain clearance due to adverse weather conditions				2											1		1		
(g)	follow ATC requirements for a change of level in CTA, including in an emergency situation				2											1		1		
(h)	comply with departure, climb, transition to cruise (levelling out), cruise, change of levels, descent and visual approach procedures in CTA and CTR instructions				2											1		1		
(i)	apply separation standards between IFR flights, and IFR and VFR flights in the various classes of CTA				2											1		1		
(j)	perform appropriate actions in the event of the loss of radio communication in CTA and CTR				2											1		1		
(k)	perform appropriate actions in the event of abnormal operations and emergency procedures in CTA and CTR				2											1		1		
(l)	operate under radar vectoring procedures, including radio procedures and phraseologies				2											1		1		
(m)	maximum permissible time interval between ATC transmissions during radar vectoring are not exceeded				2											1		1		
(n)	perform appropriate actions in the event of abnormal operations and emergencies				2											1		1		
(o)	recall transponder emergency code and communication failure code				2											1		1		

***Note: Under this scenario, flight training is undertaken in the C150 / C152 until completion of lesson 6, following which the manual propeller pitch control and retractable undercarriage design feature endorsement training (detailed in a separate syllabus), is conducted. The C-172RG is utilised from lesson 7. It is not a requirement that the CPLA flight test be conducted in an aeroplane which features a retractable undercarriage.**

Commercial Pilot Licence – Aeroplane Category Rating

LESSON PLAN AND TRAINING RECORD
CPL (A) 1: GENERAL HANDLING & CIRCUITS

Flight no:	CPL (A) 1.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- General handling – steep turns *(including minimum radius, maximum rate, collision avoidance, steep descending)*, nose-low unusual attitude recognition and recovery, sideslipping, practice forced landing
- Circuits – including 'short field' take-off and landing, missed approach and missed landing, crosswind take-off and landing
- Non–technical skills – monitor

PRE-FLIGHT KNOWLEDGE
Long Briefing: 1.5 hours Pre-flight Briefing: as required
Underpinning knowledge: as required

Content

Long briefing
- Professionalism and competent performance as a commercial pilot– expectations, flight tolerances applicable to the professional level
- General handling sequences and circuit operations
- Underpinning knowledge discussions

Underpinning knowledge
- Basic radiotelephony phraseology for visual flight rules (VFR) operations, common aviation terminology [C1 4(a)&(b)]
- Standard operating procedures for the category, and class or type of aircraft and the operator, fuel requirements for day VFR flight operation, MEL, airworthiness requirements applicable to the aircraft category, and class or type, local weather patterns, local aerodrome requirements [C2 4(a)-(f)]
- The phonetic alphabet, documented radio procedures relevant to the VFR, the components of an aeronautical radio system [C3 4(a)-(c)]
- Minimum fuel requirements for day VFR operations, fuel sources and fuel grades, including methods for identifying different grades, methods of verifying the quantity of fuel on board an aircraft [C4 4(a)-(c)]
- Typical single engine aeroplane systems, normally aspirated and fuel-injected, carburettor icing, fuel vaporisation, performance characteristics, weight and balance calculations, flight manual & POH content, VMC & day VFR, propeller wash, rotor wash, jet blast, light and marshalling signals, aerodrome markings, local procedures, propeller care [A1 4(a)-(n)]
- Calculating wind components for take-off, factors affecting take-off and initial climb performance, interpreting windsock indications, TODR calculation, aerodrome charts, local topographical charts and safe areas for engine-failure purposes, noise-abatement considerations [A2 4(a)-(f)]
- Primary and secondary effects of controls, hazards when performing manoeuvres, performance, relationship between AOB, LF and stall speed, dangers associated with mechanical and wake turbulence, engine considerations during prolonged climbs & descents, VMC, relevant sections of the AIP [A3 4(a),(b), (d)-(g),(i),(k)-(q)]
- Aeroplane performance and limitations during landing, options when local conditions not suitable for landing, causes of loss of control of aeroplane on landing [A4(a)-(k)]
- Operational circumstances where steep turns are required, aerodynamic and operational considerations relating to slow flight, sideslipping, stalling, spinning, steep turns, upset aeroplane states (see (b)(i)-(xii)), hazards of unbalanced flight [A5 4(a)-(g)]
- Engine failure scenarios and procedures for complete power loss, forced landing scenarios and procedures, judging descent profiles in various configurations, prioritising activities during emergencies and non-normal situations, suitable fields for forced landings, considerations when practising emergencies and non-normal operations, aircraft performance in a glide (straight and turning), hazard of sideslip at low altitude, contents of the flight manual and pilot's operating handbook, passenger control and briefing, low-flying hazards [A6 4(a),(b),(d)(e),(g)-(j),(l)-(o)]

LESSON PLAN AND TRAINING RECORD
CPL (A) 1: GENERAL HANDLING & CIRCUITS

PRE-FLIGHT KNOWLEDGE
Long Briefing: 1.5 hours Pre-flight Briefing: as required
Underpinning knowledge: as required

Content

HF & NTS
- Effective communication under normal and non-normal circumstances, task management [NTS1 & NTS2 4(a), NTS1 4(b), NTS2 4(i)]
- Threat and error management detailing processes that can be used to identify and mitigate or control threats and errors, the application of situation awareness to identifying real or potential environmental or operational threats to flight safety, developing and implementing plans of action for removing and mitigating threats, and removing and mitigating errors, undesired aircraft states, including prevention, identifying and controlling, how an undesired aircraft state can develop from an unmanaged threat or error, use of checklists and standard operating procedures to prevent errors [NTS2 4(b)-(f),(h)]

Pre-flight briefing
- Review flight sequences, what to expect, see & do
- Check essential knowledge
- Reinforce threat & error management
- Reinforce significant airmanship points

Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 2.0 hours dual

MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
C1.1	**Communicating face-to-face**		
(a)	pronounces words clearly, using an accent that does not cause difficulties in understanding	2	
(b)	conveys information in clearly structured sentences without confusion or ambiguity	2	
(c)	uses an extensive vocabulary to accurately communicate on general and technical topics, without excessive use of jargon, slang or colloquial language	2	
(d)	speaks fluently without long pauses, repetition or excessive false starts	2	
(e)	responds to communications with actions that demonstrate that the information has been received and understood	2	
(f)	exchanges information clearly in a variety of situations with both expert and non-expert English speakers while giving and receiving timely and appropriate responses	2	
(g)	uses appropriate techniques to validate communications	2	
C2.1	**Pre-flight actions and procedures**		
(a)	complete all required pre-flight administration documentation	2	
(b)	obtain, interpret and apply information contained in the required pre-flight operational documentation, including the following:		

LESSON PLAN AND TRAINING RECORD
CPL (A) 1: GENERAL HANDLING & CIRCUITS

FLIGHT TRAINING
Suggested flight time: 2.0 hours dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
	(i) minimum equipment list (MEL)	2	
	(ii) maintenance release	2	
	(iii) weather forecasts	2	
	(iv) local observations	2	
	(v) Notice to Airmen (NOTAM)	2	
	(vi) global navigation satellite system (GNSS) receiver autonomous integrity monitoring (RAIM) information	2	
	(vii) En Route Supplement Australia (ERSA)	2	
	(viii) Aeronautical Information Package (AIP)	2	
(c)	identify special aerodrome procedures	2	
(d)	identify all relevant radio and navigation aid facilities to be used during the flight (if applicable)	2	
(e)	determine the suitability of the current and forecast weather conditions for the proposed flight	2	
(f)	using the aircraft documents, calculate the following for a given set of environmental and operational conditions:		
	(i) weight and balance	2	
	(iii) take-off and landing performance	2	
	(iv) fuel requirements	2	
(g)	determine whether the aircraft is serviceable for the proposed flight	2	
C4.1	**Plan fuel requirements**		
(a)	determine the required fuel reserves	2	
(b)	determine the quantity of fuel required taking into account operational requirements and relevant abnormal or emergency conditions and contingencies	2	
(c)	determine the total fuel required for the flight	2	
C4.2	**Manage fuel system**		
(a)	verify fuel quantity on-board aircraft prior to flight using two independent methods	2	
(b)	ensure the fuel caps are secured	2	
(c)	perform fuel quality check prior to flight	2	
(d)	ensure fuel drain cocks are closed	2	
C2.2	**Perform pre-flight inspection**		
(a)	identify and secure equipment and documentation that is required for the flight	2	
(b)	complete an internal and external check of the aircraft	2	
(c)	identify all defects or damage to the aircraft	2	
(d)	report to, and seek advice from, qualified personnel to determine the action required in relation to any identified defects or damage	2	
(e)	ensure all aircraft locking and securing devices, covers and bungs are removed and stowed securely	2	
(f)	certify the aircraft flight technical log entering any defects or endorsements to permissible unserviceabilities as appropriate	2	
(g)	complete and certify the daily inspection (if authorised to do so)	2	
A1.1	**Start and stop engine**		
(a)	perform engine start and after start actions	2	
(d)	considers ground surface in relation to contamination and propeller care during engine start activities	2	
A1.2	**Taxi aeroplane**		
(a)	use aerodrome or landing area charts to taxi aircraft	2	

LESSON PLAN AND TRAINING RECORD
CPL (A) 1: GENERAL HANDLING & CIRCUITS

FLIGHT TRAINING Suggested flight time: 2.0 hours dual		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved*
(b)	comply with taxiway and other aerodrome markings, right-of-way rules and ATC or marshalling instructions when applicable	2	
(c)	perform applicable taxi checks, including the following:		
	(i) brakes and steering function normally and take appropriate action in the event of a malfunction	2	
	(ii) instruments for correct readings	2	
	(iii) altimeter setting	2	
(d)	maintain safe taxi speed and control of the aircraft	2	
(e)	maintain safe spacing from other aircraft, obstructions, and persons	2	
(f)	taxi the aeroplane along the centre of the taxiway	2	
(g)	avoid causing a hazard to other aircraft, objects or persons	2	
(h)	correct handling techniques are applied to take into account wind from all four quadrants	2	
(i)	correctly manage the engine during taxi manoeuvres	2	
A2.1	**Carry out pre take-off procedures**		
(a)	correctly identify critical airspeeds, configurations, and emergency and abnormal procedures for normal and crosswind take-offs	2	
(b)	work out a plan of action, in advance, to ensure the safest outcome in the event of abnormal operations	2	
(c)	verify and correctly apply correction for the existing wind component to the take-off performance	2	
(d)	perform all pre take-off and line-up checks required by the aircraft checklist	2	
(e)	ensure approach path is clear of conflicting traffic and other hazards before lining up for take-off	2	
(f)	align the aeroplane on the runway centreline	2	
A2.2	**Take off aeroplane**		
(a)	apply the controls correctly to maintain longitudinal alignment on the centreline of the runway, if appropriate, prior to initiating and during the take-off	2	
(b)	adjust the power controls taking into account the existing conditions	2	
(c)	monitor power controls, settings, and instruments during take-off to ensure all predetermined parameters are achieved and maintained	2	
(d)	adjust the controls to attain the desired pitch attitude at the predetermined airspeed to attain the desired performance	2	
(e)	perform the take-off applying the required pitch, roll and yaw inputs as appropriate in a smooth, coordinated manner	2	
(f)	trim the aeroplane accurately	2	
(g)	perform gear and flap retractions, power adjustments (as applicable) and other required pilot-related activities	2	
(h)	maintain flight path along the runway extended centreline	2	
(i)	apply the applicable noise abatement and wake turbulence avoidance procedures	2	
(j)	recognise take-off abnormalities and take appropriate action to reject take-off (can be simulated)	2	
A2.3	**Take off aeroplane in a crosswind**		
(a)	perform a take-off in an aeroplane making appropriate adjustments for the crosswind conditions	2	
(b)	maintain the runway centreline and extended centreline	2	
A2.5	**Take off aeroplane from ‘short field’**		
(a)	calculate take-off and landing performance in accordance with the aeroplane's performance charts	2	
(b)	perform take-off aeroplane to achieve the minimum length take-off performance	2	
(c)	perform take-off aeroplane to achieve the obstacle clearance parameters	2	
A2.4	**Carry out after take-off procedures**		
(a)	perform after take-off checklist	2	

LESSON PLAN AND TRAINING RECORD
CPL (A) 1: GENERAL HANDLING & CIRCUITS

FLIGHT TRAINING
Suggested flight time: 2.0 hours dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved*
(b)	maintain the appropriate climb segment at the nominated heading and airspeed	2	
(c)	manoeuvre according to local and standard procedures	2	
(d)	maintain traffic separation	2	
C3.3	**Operate transponder**		
(a)	operate a transponder during normal, abnormal and emergency operations	2	
(b)	recall transponder emergency codes	2	
C3.1	**Operate radio equipment**		
(a)	confirm serviceability of radio equipment	2	
(b)	conduct transmission and receipt of radio communications using appropriate procedures and phraseology	2	
(c)	maintain a listening watch and respond appropriately to applicable transmissions	2	
(d)	conduct appropriate emergency and urgency transmissions	2	
C1.2	**Operational communication using an aeronautical radio**		
(a)	maintain effective communication with others on operational matters	2	
(b)	communicate effectively in unfamiliar, stressful or non-standard situations	2	
(c)	apply the phonetic alphabet	2	
(d)	transmit numbers	2	
(e)	make appropriate transmissions using standard aviation phraseology	2	
(f)	use plain English effectively when standard phraseology is inadequate	2	
(g)	receive appropriate responses to transmissions	2	
(h)	respond to transmissions and take appropriate action	2	
(i)	recognise and manage communication errors and misunderstandings effectively	2	
(j)	seek clarification in the time available if a message is unclear or uncertainty exists	2	
(k)	react appropriately to a variety of regional accents	2	
(l)	communicate effectively in unexpected, stressful or non-standard situations using standard phraseology or plain English	2	
A3.1	**Climb aeroplane**		
(a)	operate and monitor all aircraft systems when commencing, during, and completing a climbing flight manoeuvre	2	
(b)	adjust altimeter subscale according to applicable settings	2	
(c)	identify and avoid terrain and traffic	2	
(d)	for the following climbing manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) cruise climb	2	
	(ii) best angle climb	2	
	(iii) best rate climb	2	
(e)	anticipate level-off altitude and achieve straight and level flight	2	
A3.2	**Maintain straight and level flight**		
(a)	operate and monitor all aircraft systems during straight and level flight manoeuvres	2	
(b)	adjust altimeter subscale according to applicable settings	2	
(c)	identify and avoid terrain and traffic	2	

LESSON PLAN AND TRAINING RECORD
CPL (A) 1: GENERAL HANDLING & CIRCUITS

FLIGHT TRAINING Suggested flight time: 2.0 hours dual		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved*
(d)	for the following straight and level manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) at slow speed	2	
	(ii) at normal cruise	2	
	(iii) at high-speed cruise	2	
	(iv) during acceleration and deceleration	2	
	(vii) with flaps selected	2	
A3.4	**Turn aeroplane**		
(a)	operate and monitor all aircraft systems during turning flight manoeuvres	2	
(b)	for the following turning manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) level turns	2	
	(ii) climbing turns	2	
	(iii) powered descending turns	2	
	(iv) gliding descending turns	2	
(c)	complete turn manoeuvre on a nominated heading or geographical feature	2	
(d)	turn aeroplane at varying rates to achieve specified tracks	2	
(e)	manoeuvre aeroplane over specified tracks or geographical features	2	
A5.3	**Turn aeroplane steeply**		
(a)	pre-manoeuvre checks for steep turning	2	
(b)	steep level turn using a nominated bank angle, ending on a nominated heading or geographical feature, without altitude change	2	
(c)	steep descending turn using a nominated bank angle, ending on a nominated heading or geographical feature ending on a nominated altitude	2	
(d)	aeroplane operating limits are not exceeded	2	
A6.6	**Recover from unusual flight attitudes** *Nose-low unusual attitudes*		
(a)	identify nose-low unusual attitude flight condition	2	
(b)	recover from nose-low unusual attitudes by adjusting pitch, bank and power to resume controlled and balanced flight	2	
(c)	apply controlled corrective action while maintaining aircraft performance within limits	2	
A5.4	**Sideslip aeroplane (where flight manual permits)**		
(a)	straight sideslip:		
	(i) induce slip to achieve increased rate of descent while maintaining track and airspeed	2	
	(ii) adjust rate of descent by coordinating angle of bank and applied rudder	2	
(b)	sideslipping turn by adjusting the bank angle to turn through minimum heading change of 90° at constant airspeed using sideslip, and exiting the turn on a specified heading or geographical feature, within tolerance	2	
(c)	recover from a sideslip and return the aeroplane to balanced flight	2	
A6.3	**Perform forced landing (simulated)**		
(a)	after a simulated complete engine failure has occurred, without prior indications, carry out the following:		
	(i) identify complete power failure condition and control aeroplane	2	
	(ii) perform immediate actions	2	

LESSON PLAN AND TRAINING RECORD
CPL (A) 1: GENERAL HANDLING & CIRCUITS

MOS Reference	FLIGHT TRAINING Suggested flight time: 2.0 hours dual **Lesson Content** *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
	(iii) formulate and describe a recovery plan, including selecting the most suitable landing area	2	
	(iv) establish optimal gliding flight path to position the aeroplane for a landing on the selected landing area	2	
	(v) perform emergency procedures and land the aeroplane if the engine cannot be restarted as time permits	2	
	(vi) advise ATS or other agencies capable of providing assistance of situation and intentions	2	
	(vii) re-brief passengers about flight situation, brace position and harness security	2	
	(viii) land the aeroplane ensuring safest outcome if an engine restart is not achieved	2	
C4.2	**Manage fuel system**		
(e)	monitor fuel usage during the flight	2	
(f)	accurately maintain fuel log	2	
(g)	calculate and state endurance at any point during flight	2	
(h)	perform fuel tank changes correctly	2	
(i)	maintain fuel load within aircraft limits	2	
(j)	operate the fuel cross-feed system correctly (if fitted)	2	
(k)	operate fuel pumps and engine controls correctly	2	
A3.3	**Descend aeroplane**		
(a)	operate and monitor all aircraft systems during descending flight manoeuvres	2	
(b)	for the following descending manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) glide	2	
	(ii) powered	2	
	(iii) approach configuration descent (flap and undercarriage)	2	
(c)	anticipate level-off altitude and achieve straight and level flight	2	
A3.6	**Perform circuits and approaches**		
(a)	operate and monitor all aircraft systems when operating the aeroplane in the circuit	2	
(b)	in accordance with specific local procedures, safely perform a full circuit pattern (5 legs) by balancing and trimming the aeroplane accurately while applying smooth, coordinated control inputs to achieve the required flight tolerances specified for the flight path flown during traffic pattern manoeuvres as follows:		
	(i) track upwind along extended centreline to 500 ft	2	
	(ii) establish and maintain crosswind leg tracking 90° to the runway	2	
	(iii) establish and maintain downwind leg tracking parallel to, and at a specified distance from, the runway at circuit height	2	
	(iv) establish base leg tracking 90° to the runway at a specified distance from the runway threshold	2	
(c)	perform checks as required throughout circuit	2	
(d)	establish the approach and landing configuration appropriate for the runway and meteorological conditions, and adjust the power plant controls as required for the following:		
	(i) commence and control approach descent path	2	
	(ii) adjust descent commencement point to take account of extended downwind leg or traffic adjustments	2	
	(iii) align and maintain aircraft on final approach flight path with specified or appropriate runway	2	
	(iv) set and maintain approach configuration not below 500 ft AGL	2	
	(v) identify and maintain the nominated aiming point	2	
	(vi) maintain a stabilised approach angle at the nominated airspeed not less than 1.3Vs to the round-out height	2	

LESSON PLAN AND TRAINING RECORD
CPL (A) 1: GENERAL HANDLING & CIRCUITS

FLIGHT TRAINING Suggested flight time: 2.0 hours dual			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard Required	 Achieved*
	(vii) verify existing wind conditions, make proper correction for drift, and maintain a precise ground track	2	
	(viii) apply speed allowances for wind gusts	2	
	(ix) configure aeroplane for landing	2	
(e)	maintain aircraft separation and position in the circuit with reference to other aircraft traffic in the circuit area	2	
A4.3	**Conduct a missed approach**		
(a)	recognise the conditions when a missed approach should be executed	2	
(b)	make the decision to execute a missed approach when it is safe to do so	2	
(c)	make a smooth, positively-controlled transition from approach to missed approach, including the following:		
	(i) select power, attitude and configuration to safely control aeroplane	2	
	(ii) manoeuvre aeroplane clear of the ground and conduct after take-off procedures	2	
	(iii) make allowance for wind velocity during go-around	2	
	(iv) avoid wake turbulence	2	
A4.4	**Perform recovery from missed landing**		
(a)	recognise when a missed landing is occurring and when it is appropriate to take recovery action	2	
(b)	make the decision to execute recovery from a missed landing only when it is safe to do so	2	
(c)	make a smooth, positively-controlled transition from a missed landing to missed approach, including the following:		
	(i) select power, attitude and configuration to safely control aeroplane	2	
	(ii) manoeuvre aeroplane clear of the ground and conduct after take-off procedures	2	
	(iii) make allowance for wind velocity during go-around	2	
	(iv) avoid wake turbulence	2	
A4.2	**Land aeroplane in a crosswind**		
(a)	verify existing wind conditions, make proper correction for drift, and maintain a precise ground track	2	
(b)	configure the aeroplane for the crosswind conditions	2	
(c)	control the aeroplane during the transition from final approach to touchdown and during after-landing roll to compensate for the crosswind conditions	2	
A4.5	**Short landing**		
(a)	land aeroplane at nominated touchdown point at minimum speed	2	
(b)	control ballooning during flare	2	
(c)	control bouncing after touchdown	2	
(d)	maintain direction after touchdown	2	
(e)	apply maximum braking without locking up wheels	2	
(f)	stops aircraft within landing distance available	2	
A4.1	**Land aeroplane**		
(a)	maintain a constant landing position aim point	2	
(b)	achieve a smooth, positively-controlled transition from final approach to touchdown, including the following:		
	(i) control ballooning during flare	2	
	(ii) touchdown at a controlled rate of descent, in the specified touchdown zone within tolerances	2	
	(iii) control bouncing after touchdown	2	
	(iv) touch down aligned with the centreline within tolerances	2	
(c)	ensure separation is maintained	2	

LESSON PLAN AND TRAINING RECORD
CPL (A) 1: GENERAL HANDLING & CIRCUITS

FLIGHT TRAINING Suggested flight time: 2.0 hours dual			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	**Achieved***
(d)	maintain positive directional control and crosswind correction during the after-landing roll	2	
(e)	use drag and braking devices, as applicable, in such a manner to bring the aeroplane to a safe stop	2	
(f)	complete the applicable after-landing checklist items in a timely manner	2	
A1.1	**Start and stop engine**		
(b)	perform engine shutdown and after shutdown actions	2	
(d)	considers ground surface in relation to contamination and propeller care during engine stop activities	2	
C2.3	**Post-flight actions and procedures**		
(a)	shut down aircraft	2	
(b)	conduct post-flight inspection and secure the aircraft (if applicable)	2	
(c)	complete all required post-flight administration documentation	2	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

Commercial Pilot Licence – Aeroplane Category Rating

LESSON PLAN AND TRAINING RECORD
CPL (A) 2: GENERAL HANDLING & BASIC INSTRUMENT FLIGHT

Flight no:	CPL (A) 2.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- General handling – control at slow speeds, stalling under various conditions and configurations, incipient spins, nose-high unusual attitude recognition and recovery, practice forced landing (simulated partial engine failure), precautionary search and landing
- Basic instrument flight –full instrument panel manoeuvres, introduction to limited panel manoeuvres
- Local area airspace
- Non–technical skills – monitor

PRE-FLIGHT KNOWLEDGE
Long Briefing: 1.0 hour Pre-flight Briefing: as required
Underpinning knowledge: as required

Content

Long briefing

- Basic instrument flight –full and limited panel
- Precautionary search and landing
- Underpinning knowledge discussions

Underpinning knowledge

- The stall warning devices, turning using a magnetic compass, relationship between AOB, LF and stall speed, relationship between induced drag and operating at slow speed [A3 4(c),(h),(i),(j)]
- Aerodynamic and operational considerations relating to slow flight, stalling, spinning, upset aeroplane states (see A5 4(b)(i)-(xii)), hazards of unbalanced flight [A5 4(a)-(g)]
- Engine failure scenarios and procedures for partial power loss, causes leading to precautionary landings, suitable fields for precautionary landings, ditching, effects of partial engine power on performance, flight profile, range and landing options [A6 4(a),(c),(f),(k)]
- Scan technique appropriate to fitted flight instruments and phase of flight, attitude and power requirements to achieve specified flight profiles, instrument failure and warning systems fitted to the aeroplane [IFF 4(a)-(c)]
- Scan technique appropriate to fitted flight instruments and phase of flight (without attitude or stabilised heading indicators), performance instrument indications and power requirements to achieve specified flight profiles, anti-icing and de-icing controls and switches fitted to the aircraft type, and when these systems should be operated, instrument failure and warning systems fitted to the aircraft, the safety risks associated with application of large or rapid control inputs in more than one axis simultaneously [IFL 4 (a)-(e)]

LESSON PLAN AND TRAINING RECORD
CPL (A) 2: GENERAL HANDLING & BASIC INSTRUMENT FLIGHT

PRE-FLIGHT KNOWLEDGE **Long Briefing: 1.0 hour Pre-flight Briefing: as required** **Underpinning knowledge: as required**	
Content	
HF & NTS • Effective communication under normal and non-normal circumstances, task management [NTS1 & NTS2 4(a), NTS1 4(b), NTS2 4(i)] • Threat and error management detailing processes that can be used to identify and mitigate or control threats and errors, the application of situation awareness to identifying real or potential environmental or operational threats to flight safety, developing and implementing plans of action for removing and mitigating threats, and removing and mitigating errors, undesired aircraft states, including prevention, identifying and controlling, how an undesired aircraft state can develop from an unmanaged threat or error, use of checklists and standard operating procedures to prevent errors [NTS2 4(b)-(f),(g)]	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 2.0 hours dual (1.0 IF)

MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** Required	Achieved*
IFF.1	**Determine and monitor the serviceability of flight instruments and instrument power sources**		
(a)	determine serviceability of flight and navigational instruments	2	
(b)	perform functional checks of flight and navigational instruments where applicable prior to take-off	2	
A3.5	**Control aeroplane at slow speeds**		
(a)	complete pre-manoeuvre checks	2	
(b)	operate and monitor all aircraft systems when operating the aeroplane at slow speed	2	
(c)	for the following climbing manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) minimum approach speed with flaps retracted	2	

LESSON PLAN AND TRAINING RECORD
CPL (A) 2: GENERAL HANDLING & BASIC INSTRUMENT FLIGHT

FLIGHT TRAINING **Suggested flight time: 2.0 hours dual (1.0 IF)**			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	**Achieved***
	(ii) minimum approach speed in approach configuration	2	
(d)	observe audible and visual stall warnings and recover aeroplane to controlled flight	2	
(e)	recognise and respond positively to reduced effectiveness of controls during slow flight manoeuvres	2	
(f)	transition from slow speed configuration using take-off power to achieve nominated speed in excess of 1.5 Vs without loss of height	2	
A5.1	**Enter and recover from stall**		
(a)	perform pre-manoeuvre checks for stalling	2	
(b)	recognise stall signs and symptoms	2	
(c)	control the aeroplane by applying the required pitch, roll and yaw inputs as appropriate in a smooth, coordinated manner, trim aeroplane accurately to enter and recover from the following manoeuvres:		
	(i) incipient stall	2	
	(ii) stall with full power applied	2	
	(iii) stall without power applied	2	
	(iv) stall under the following conditions:		
	(A) straight and level flight	2	
	(B) climbing	2	
	(C) descending	2	
	(D) approach to land configuration	2	
	(E) turning	2	
(d)	perform stall recovery as follows:		
	(i) positively reduce angle of attack	2	
	(ii) use power available and excess height to increase the aircraft energy state	2	
	(iii) minimise height loss for simulated low altitude condition	2	
	(iv) re-establish desired flight path and aircraft control	2	
(e)	recover from stall in simulated partial and complete engine failure configurations	2	
A5.2	**Recover from incipient spin**		
(a)	perform pre-manoeuvre checks for an incipient spin	2	
(b)	recognise an incipient spin	2	
(c)	use the aeroplane's attitude and power controls to execute an incipient spin manoeuvre from the following flight conditions and, using correct recovery technique, regain straight and level flight with height loss commensurate with the available altitude (simulated ground base height may be set):		
	(i) straight and level flight	2	
	(ii) climbing	2	
	(iii) turning	2	
A6.6	**Recover from unusual flight attitudes** *Nose-high unusual attitudes*		
(a)	identify nose-high unusual attitude flight condition	2	
(b)	recover from nose-high unusual attitudes by adjusting pitch, bank and power to resume controlled and balanced flight	2	
(c)	apply controlled corrective action while maintaining aircraft performance within limits	2	
A6.3	**Perform forced landing (simulated)**		
(b)	after a simulated partial engine failure has occurred, without prior indications, carry out the following:		

LESSON PLAN AND TRAINING RECORD
CPL (A) 2: GENERAL HANDLING & BASIC INSTRUMENT FLIGHT

FLIGHT TRAINING **Suggested flight time: 2.0 hours dual (1.0 IF)**			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	**Achieved***
	(i) identify partial power failure condition	2	
	(ii) perform recall actions	2	
	(iii) adjust flight controls to re-establish flight path that maximises performance for partial power condition and maintain a safe airspeed margin above stall speed	2	
	(iv) establish radio communications where possible	2	
	(v) perform partial engine failure actions	2	
	(vi) formulate a plan to recover aeroplane to a safe landing area or aerodrome, taking into account that partial failure might lead to a full power failure at any time	2	
	(vii) manoeuvre the aeroplane to a selected landing area or aerodrome using the remaining power to establish an optimal aircraft position for a safe landing	2	
	(viii) advise ATS or other agencies capable of providing assistance of situation and intentions	2	
	(ix) re-brief passengers about flight situation, brace position and harness security	2	
	(x) maintain a contingency plan for coping with a full power failure throughout the manoeuvre	2	
	(xi) when a safe landing position is established, shut down and secure engine and aeroplane	2	
A6.4	**Conduct precautionary search and landing (simulated condition)**		
(a)	assess flight circumstances and make an appropriate decision when to perform precautionary landing	2	
(b)	configure aeroplane for conditions	2	
(c)	perform precautionary search procedure	2	
(d)	select landing area, carry out an inspection and assess its suitability for landing, taking into account:		
	(i) unobstructed approach and overshoot paths	2	
	(ii) landing area length adequate for landing	2	
	(iii) landing area surface is suitable for aeroplane type and clear of hazards	2	
(e)	maintain orientation and visual contact with the landing area	2	
(f)	advise ATS or other agencies capable of providing assistance of situation and intentions	2	
(g)	re-brief passengers about flight situation, brace position and harness security	2	
(h)	land and secure aircraft and manage passengers	2	
IFF.1	**Determine and monitor the serviceability of flight instruments and instrument power sources**		
(c)	monitor flight instrument and instrument power sources and react to any warnings, unserviceability or erroneous indications	2	
IFF.2	**Perform manoeuvres using full instrument panel**		
(a)	interpret flight instrument indications and apply procedures and techniques to achieve and maintain a specified flight path using the aircraft's full instrument panel	2	
(b)	set and maintain power and attitude by reference to the full instrument panel to achieve the following:		
	(i) straight and level performance during normal cruise within the flight tolerances	2	
	(ii) nominated climb performance within the flight tolerances	2	
	(iii) descent performance within the flight tolerances	2	
(c)	set and maintain power and attitude by reference to the full instrument panel to establish a rate 1 turn onto a nominated heading within the flight tolerances	2	
IFF.3	**Recover from upset situations and unusual attitudes**		
(a)	correctly identify upset situations and unusual attitudes under simulated IMC	2	
(b)	recover to controlled flight from upset situations and unusual attitudes under simulated IMC from any combination of the following aircraft states:		
	(i) high and low-nose attitudes	2	

LESSON PLAN AND TRAINING RECORD
CPL (A) 2: GENERAL HANDLING & BASIC INSTRUMENT FLIGHT

FLIGHT TRAINING Suggested flight time: 2.0 hours dual (1.0 IF)		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved*
	(ii) varying angles of bank	2	
	(iii) various power settings	2	
	(iv) various aircraft configurations	2	
	(v) unbalanced flight	2	
IFL.1	**Recognise failure of attitude indicator and stabilised heading indicator**		
(a)	monitor flight instruments and instrument power sources and recognise warning indicators or erroneous instrument indications	3	
(b)	transition from a full instrument panel to a limited instrument panel	3	
IFL.2	**Perform manoeuvres – limited panel**		
(a)	interpret and respond appropriately to instrument indications	3	
(b)	apply power and attitude settings to achieve straight and level performance during:		
	(i) normal cruise	3	
	(ii) approach configuration with flaps (when fitted) and undercarriage down	3	
(c)	apply power and attitude settings to achieve:		
	(i) nominated climb performance	3	
	(ii) nominated descent performance	3	
	(iii) during climb, descent and straight and level flight, rate 1 turns onto a nominated heading	3	
(d)	trim (as applicable) and balance aircraft	3	
(e)	establish level flight at a nominated altitude, from a climb or descent during straight or turning flight	3	
IFL.3	**Recover from upset situations and unusual attitudes – limited panel**		
(a)	correctly identify upset situations and unusual attitudes under simulated IMC	3	
(b)	recover to stabilised straight and level flight using approved techniques from upset situations and unusual attitudes under simulated IMC from any combination of the following aircraft states:		
	(i) high and low-nose attitudes	3	
	(ii) varying angles of bank	3	
	(iii) various power settings	3	
	(iv) various aircraft configurations	3	
	(v) unbalanced flight	3	
IFL.4	**Re-establish visual flight**		
(a)	transition from visual flight conditions to instrument flight conditions while maintaining control of the aircraft	3	
(b)	perform a manoeuvre to re-establish visual flight	3	
(c)	implement a plan that ensures the flight continues in VMC	3	
A3.7	**Local area airspace**		
(a)	using an appropriate chart, for the local area and circuit area:		
	(i) identify geographical features	2	
	(ii) identify geographical limits	2	
	(iii) identify restricted, controlled and uncontrolled airspace areas	2	
	(iv) state local airspace limits	2	
	(v) identify the transit route between the departure aerodrome and training area	2	
	(vi) identify the geographical limits of the training area	2	
	(vii) identify aerodromes and landing areas within the local area	2	

LESSON PLAN AND TRAINING RECORD
CPL (A) 2: GENERAL HANDLING & BASIC INSTRUMENT FLIGHT

FLIGHT TRAINING
Suggested flight time: 2.0 hours dual (1.0 IF)

MOS Reference	Lesson Content (Elements & Performance Criteria)	Performance Standard: Required	Performance Standard: Achieved*
(b)	maintain orientation and pinpoint location by using geographical features and a local area chart	2	
(c)	transit from the circuit area and transit to the designated training area	2	
(d)	operate safely within a transit lane (if applicable)	2	
(e)	remain clear of restricted, controlled and other appropriately designated airspace	2	
(f)	operate safely in the vicinity of local aerodromes and landing areas	2	
(g)	transit from the designated training area to the circuit area	2	
(h)	set QNH appropriately	2	
(i)	correctly determine which runway is to be used for landing	2	
(j)	ensure runway is serviceable and available	2	
(k)	position aircraft for arrival into the circuit	2	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING

MOS Reference	Lesson Content (Elements & Performance Criteria)	Performance Standard: Required	Performance Standard: Achieved

DEBRIEFING

Content

- Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards
- Recommendations for next lesson (including any carryover/remedial training)
- Trainee preparation for next lesson
- Training record completion and sign off

LESSON PLAN AND TRAINING RECORD
CPL (A) 2: GENERAL HANDLING & BASIC INSTRUMENT FLIGHT

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

AAT	**Commercial Pilot Licence – Aeroplane Category Rating**

LESSON PLAN AND TRAINING RECORD
CPL (A) 3: NAVIGATION EXERCISE #1

Flight no:	CPL (A) 3.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- CPL Navigation Exercise 1 – Navigation route: YRED – YMYB – YWND – YNAN – YWSG - YRED
- Introduction to simulated commercial operations
  - expected level of proficiency, flight tolerances applicable to the professional level
  - flight planning, payload and fuel scenarios
- Simulated engine failure on take-off, simulated engine failure in the circuit
- General handling – steep turns, sideslipping, practice forced landing – simulated complete engine failure
- Navigation using navigation aids and systems
- Non-technical skills – monitor

**lesson plan scenario – OCTA (operating base) – OCTA – OCTA (reflected in order of performance criteria)*

PRE-FLIGHT KNOWLEDGE
Long Briefing: 2.0 hours Pre-flight Briefing: as required
Underpinning knowledge: as required

Content

Long briefing
- Flight planning and flight notification
- Fuel planning (including for maximum payload and minimum fuel scenarios)
- Weight and balance calculations
- Take-off and landing distance calculations
- Navigation cycles, track correction techniques, fuel logs (under planned scenario and actual fuel status)
- Position fixing

Underpinning knowledge
- Dead-reckoning navigation, maximum payload and minimum fuel operations [NAV 4(c),(f)]
- Decode NOTAM, aerodrome ground markings and lighting, standard RT phraseology for operations at non-towered aerodromes and landing areas, transponder codes for G airspace [ONTA 4(a)-(c),(e)]
- Class G airspace [OGA]

HF & NTS
- The use of scenarios during simulated commercial operations and management of actual flight situation and fuel status
- Methods for simulating emergencies, management of actual emergencies, pilot in command and transfer of control
- The level of proficiency expected of a commercial pilot, including:
  - highly developed task management skills
  - efficient and effective decision making skills
  - maintenance of positive, smooth and accurate aeroplane control
  - the ability to maintain situational awareness
  - the application of the correct technique and sound judgement
  - passenger control and management skills.

LESSON PLAN AND TRAINING RECORD
CPL (A) 3: NAVIGATION EXERCISE #1

PRE-FLIGHT KNOWLEDGE Long Briefing: 2.0 hours Pre-flight Briefing: as required Underpinning knowledge: as required	
Content	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	2	1
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 2.5 hours dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved*
NAV.1	**Prepare documents and flight plan**		
(a)	select and prepare appropriate navigation charts for the intended flight	2	
(b)	select a suitable route and altitude considering weather, terrain, airspace, NOTAMs and alternate landing areas	2	
(c)	obtain and interpret meteorological forecasts, NOTAMs and operational information applicable to the planned flight	2	
(d)	determine whether the planned flight can be conducted under the applicable flight rules and taking account of the beginning and end of daylight times	2	
(f)	complete a flight plan to the planned destination and alternates	2	
(g)	lodge suitable flight notification for search and rescue (SAR) purposes	2	
ONTA.1	**Non-towered aerodrome – pre-flight preparation**		
(a)	using a current ERSA and NOTAM, for the non-towered aerodrome or landing area, extract all of the relevant operational information	2	
(b)	interpret the extracted information	2	
(c)	identify all special aerodrome procedures	2	
(d)	check current weather forecast and local observations	2	
(e)	identify all relevant radio and navigation aid frequencies	2	
ONTA.2	**Taxi aircraft at a non-towered aerodrome or landing area**		
(a)	refer to aerodrome or landing area chart (if available)	2	
(b)	set local QNH or area QNH	2	
(c)	broadcast intentions on appropriate frequency	2	
(d)	obtain and interpret traffic information	2	

LESSON PLAN AND TRAINING RECORD
CPL (A) 3: NAVIGATION EXERCISE #1

FLIGHT TRAINING Suggested flight time: 2.5 hours dual			
MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
(e)	maintain lookout for, and separation from, other aircraft, wildlife and other obstructions	2	
(f)	recognise ground markings during taxi and take appropriate action	2	
(h)	taxi aircraft to holding point	2	
(i)	use strobes when crossing any runway	2	
A6.1	**Manage engine failure - take-off (simulated)**		
(a)	correctly identify an engine failure after take-off	2	
(b)	apply the highest priority to taking action to control the aeroplane	2	
(c)	maintain control of the aeroplane	2	
(d)	perform recall actions	2	
(e)	perform emergency actions as far as time permits	2	
(f)	manoeuvre the aeroplane to achieve the safest possible outcome	2	
(g)	ensure passengers adopt brace position	2	
(h)	advise others such as ATS and other aircraft of intentions if time permits	2	
ONTA.3	**Perform departure at a non-towered aerodrome or landing area**		
(a)	check and ensure runway approach is clear prior to entering a runway	2	
(b)	correctly set transponder code and mode prior to entering runway for take-off	2	
(c)	confirm runway approaches clear in all directions prior to entering runway	2	
(d)	broadcast line up details	2	
(f)	transmit appropriate radio calls and maintain separation with other aircraft	2	
(g)	advise air service provider of departure details, if required	2	
(h)	conduct departure	2	
NAV.3	**Conduct departure procedures**		
(a)	organise cockpit to ensure charts, documentation and navigational calculator are accessible from the control seat	2	
(b)	comply with all departure procedures, clearances and noise abatement requirements	2	
(c)	establish planned track on departure within 5 nm of airfield or apply alternative procedure if required	2	
(d)	calculate estimated time of arrival (ETA) for first waypoint	2	
NAV.2	**Comply with airspace procedures while navigating**		
(a)	identify airspace restrictions and dimensions applicable to the flight	2	
(b)	obtain and comply with air traffic clearances, if applicable	2	
(c)	comply with airspace procedures applicable to the airspace classification throughout the flight	2	
NAV.4	**Navigate aircraft enroute**		
(a)	maintain a navigation cycle that ensures accurate tracking, and apply track correctional techniques to re-establish track prior to waypoint or destination	2	
(b)	maintain heading to achieve a nominated track	2	
(c)	maintain and revise ETAs (±2 minutes) for waypoint or destination	2	
(d)	maintain track in accordance with published flight path tolerances in controlled airspace	2	
(e)	navigate using accepted map-reading techniques	2	
(f)	maintain navigation and fuel log to monitor tracking, ETAs and fuel status	2	
(g)	use appropriate techniques to obtain a positive fix at suitable intervals	2	
(h)	maintain awareness of route, enroute terrain, enroute and destination weather, and react appropriately to changing weather conditions	2	

LESSON PLAN AND TRAINING RECORD
CPL (A) 3: NAVIGATION EXERCISE #1

FLIGHT TRAINING
Suggested flight time: 2.5 hours dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
(i)	perform pre-descent and turning point checks	2	
(j)	maintain appropriate radio communication and listening watch with ATS and other aircraft if radio is fitted and used	2	
(l)	maintain awareness of search and rescue times (SARTIME) and revise as required	2	
(m)	monitor aircraft systems, manage fuel and engine to ensure aircraft is operated to achieve flight plan objectives	2	
OGA	**Operate aircraft in Class G airspace**		
(a)	maintain tracking and altitude tolerances to remain outside controlled airspace	2	
(b)	apply separation tolerances between IFR flights, and IFR and VFR flights	2	
(c)	when using an aircraft radio:		
	(i) monitor appropriate radio frequency	2	
	(ii) make appropriate radio calls	2	
	(iii) obtain operational information from air services provider and other aircraft	2	
	(iv) use information to ensure aircraft separation is maintained	2	
(d)	using a suitable chart:		
	(i) operate clear of active aerodromes and landing areas in the vicinity of the aircraft	2	
	(ii) identify and remain clear of controlled and restricted airspace	2	
	(iii) take appropriate action when operating in the vicinity of a danger area	2	
(e)	perform actions in the event of abnormal operations and emergencies	2	
(f)	recall transponder emergency code and communication failure code	2	
A5.3	**Turn aeroplane steeply** *(steep level turns)*	2	
A5.4	**Sideslip aeroplane (where flight manual permits)** *(straight sideslip)*	2	
A6.3	**Perform forced landing (simulated)** *(simulated complete engine failure)*	2	
NAV.9	**Execute arrival procedures**		
(a)	obtain updated relevant aerodrome information	2	
(b)	determine landing direction and aerodrome suitability	2	
(c)	conduct arrival	2	
(d)	identify and avoid all traffic	2	
(e)	observe local and published noise abatement requirements and curfews	2	
ONTA.4	**Perform arrival and landing at a non-towered aerodrome or landing area**		
(a)	check ERSA and NOTAM prior to entering circuit area	2	
(b)	set correct area or local QNH	2	
(c)	use correct radio frequency to transmit inbound calls as required	2	
(d)	maintain effective lookout	2	
(e)	maintain aircraft separation and avoid other traffic	2	
(f)	maintain tracking tolerances	2	
(g)	determine wind velocity	2	
(h)	determine landing direction	2	
(i)	confirm runway is serviceable for the operation	2	
(j)	determine circuit direction	2	

LESSON PLAN AND TRAINING RECORD
CPL (A) 3: NAVIGATION EXERCISE #1

FLIGHT TRAINING **Suggested flight time: 2.5 hours dual**			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	**Achieved***
(k)	conduct landing area inspection (if applicable)	2	
(l)	position aircraft in the circuit in preparation for landing and maintain separation from traffic	2	
(m)	make all necessary circuit radio calls	2	
A6.2	**Manage engine failure in the circuit area (simulated)**		
(a)	correctly identify an engine failure during flight	2	
(b)	apply the highest priority to taking action to control the aeroplane	2	
(c)	perform recall actions	2	
(d)	select a suitable landing area within gliding distance, on the aerodrome or elsewhere	2	
(e)	perform emergency procedures and land the aeroplane if the engine cannot be restarted as time permits	2	
(f)	advise ATS or other agencies capable of providing assistance of situation and intentions	2	
(g)	re-brief passengers about flight situation, brace position and harness security	2	
(h)	land the aeroplane ensuring safest outcome if an engine restart is not achieved	2	
ONTA.4	**Perform arrival and landing at a non-towered aerodrome or landing area**		
(n)	verify runway is clear of other traffic, wildlife and other obstructions	2	
(o)	land the aircraft	2	
(p)	vacate runway	2	
(q)	cancel SARWATCH, if applicable	2	
NAV.9	**Execute arrival procedures**		
(f)	cancel SARWATCH	2	

***Enter the performance standard achieved if it is different to that required**
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	**Achieved**

	LESSON PLAN AND TRAINING RECORD **CPL (A) 3: NAVIGATION EXERCISE #1**

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

Commercial Pilot Licence – Aeroplane Category Rating

LESSON PLAN AND TRAINING RECORD
CPL (A) 4: NAVIGATION EXERCISE #2

Flight no:	CPL (A) 4.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- CPL Navigation Exercise 2 – Navigation route: YRED – YBAF – YKRY - "Woolooga " – YMYB – YBSU - YRED
- Simulated commercial exercise, including simulated passenger and cargo management and loading
- Controlled airspace and controlled aerodrome operations
- Critical point and point of no return calculations
- Refuelling
- Engine start and shutdown – simulated emergencies
- Simulated engine failure on take-off
- Simulated R/T equipment malfunction
- Navigation at low level, best range and best endurance performance, turbulence penetration configuration
- Basic instrument flight –simulated inadvertent IMC entry and return to visual flight
- Perform lost procedure
- Perform diversion procedure
- General handling - stalling, incipient spin
- Practice forced landing – simulated partial engine failure, simulated engine failure in circuit area
- Precautionary search and landing
- Other abnormal situations – simulated electrical failure
- Short landing
- Monitor application of non-technical skills
- **Assess:**
  - non-technical skills – maintain effective lookout

**lesson plan scenario – OCTA– CTA – OCTA (reflected in order of performance criteria)*

PRE-FLIGHT KNOWLEDGE
Long Briefing: as required Pre-flight Briefing: as required
Underpinning knowledge: as required

Content

Long briefing
- Preparation for and overview of exercise
- Use of navigation aids and systems
- Revision as required

LESSON PLAN AND TRAINING RECORD
CPL (A) 4: NAVIGATION EXERCISE #2

PRE-FLIGHT KNOWLEDGE **Long Briefing: as required Pre-flight Briefing: as required** **Underpinning knowledge: as required**	
Content	
Underpinning knowledge • Light signals, including interpretation and actions required [C3 4(f)] • Fire extinguishers that can be used for fuel-related fires, including requirements and how to use them in the event of a fire, location of refuelling places, limitations on using drum stock fuel, health and safety requirements applicable to fuelling operations, variations to planned fuel consumption [C4 4(d)-(h)] • Managing passengers during abnormal or emergency situations, local procedures for movement of passengers, security requirements, dangerous goods awareness, health and safety regulations and best practice [C5 4(a)-(e)] • NOTAM decoding, aerodrome ground markings and lighting, standard RT phraseology, transponder codes for emergency [CTR 4(a)-(c),(e)] • Decode NOTAMS, aerodrome ground markings and lighting, standard RT phraseology for operations at controlled aerodromes, transponder codes [CTA 4(a)-(c),(e)] • Radio failure procedures in ERSA [ONTA 4(d)], Radio failure procedures in ERSA, transponder codes for radio failure and emergency [CTR 4(d)&(e)], [CTA 4(d)]	
HF & NTS • Effective communication under normal and non-normal circumstances, task management [NTS1 & NTS2 4(a), NTS1 4(b), NTS2 4(i)] • Threat and error management detailing processes that can be used to identify and mitigate or control threats and errors, the application of situation awareness to identifying real or potential environmental or operational threats to flight safety, developing and implementing plans of action for removing and mitigating threats, and removing and mitigating errors, undesired aircraft states, including prevention, identifying and controlling, how an undesired aircraft state can develop from an unmanaged threat or error, use of checklists and standard operating procedures to prevent errors [NTS2 4(b)-(f),(g)]	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

LESSON PLAN AND TRAINING RECORD
CPL (A) 4: NAVIGATION EXERCISE #2

MOS Reference	**FLIGHT TRAINING** Suggested flight time: 2.5 hours dual (0.3 IF) — **Lesson Content** *(Elements & Performance Criteria)*	Performance Standard: Required	Achieved*
NAV.1	**Prepare documents and flight plan**		
(e)	calculate and document critical point (CP) and point of no return (PNR) locations	3	
CTR.1	**Controlled aerodrome pre-flight preparation**		
(a)	using a current ERSA and NOTAM, for the controlled aerodrome, extract all the relevant operational information	2	
(b)	interpret the extracted information	2	
(c)	identify all special aerodrome procedures	2	
(d)	check current weather forecast and local observations	2	
(e)	identify all relevant radio and navigation aid frequencies	2	
C4.3	**Refuel aircraft**		
(a)	identify the correct type of fuel to be used	2	
(b)	ensure aircraft is earthed prior to refuelling and defueling operations	2	
(c)	correctly load and unload fuel	2	
(d)	ensure required fuel quantity is loaded	2	
(e)	ensure fuel caps are closed and secured after fuelling operations	2	
(f)	perform fuel quality checks	2	
C5.1	**Manage passengers**		
(a)	supervise passenger safety	2	
(b)	encourage passengers to participate in and contribute to the safe outcome of the flight	2	
(c)	conduct pre-flight passenger safety briefing	2	
(d)	ensure passengers are aware of, and avoid interference with, flight and systems controls	2	
(e)	ensure passengers are aware of, and comply with, the use of seat harnesses	2	
(f)	ensure passengers are aware of the use of escape hatches, exits and emergency equipment on board the aircraft	2	
(g)	manage passenger safety in the event of abnormal or in-flight emergency situations	2	
C5.2	**Aid and assist passengers**		
(a)	establish and maintain clear communications with passengers	2	
(b)	assist with passenger comfort both when airside and in flight	2	
C5.3	**Manage cargo**		
(a)	manage loading, unloading and security of cargo during flight operations	2	
(b)	identify dangerous goods and apply procedures to ensure safety and security	2	
A1.1	**Start and stop engine**		
(c)	manage engine start malfunctions and emergencies *(e.g. flooded start, inoperative magneto after start)*	2	
A6.1	**Manage engine failure - take-off** (simulated)	2	
C3.2	**Manage R/T equipment malfunctions** *(scenario outbound, scenario inbound to operating base)*		
(a)	perform radio failure procedures	2	
(b)	use fault finding procedures and perform corrective actions	2	
OGA	**Operate aircraft in Class G airspace**		
	(v) apply loss of radio communication procedures	2	

LESSON PLAN AND TRAINING RECORD
CPL (A) 4: NAVIGATION EXERCISE #2

FLIGHT TRAINING
Suggested flight time: 2.5 hours dual (0.3 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved*
NAV.4	**Navigate aircraft enroute**		
(k)	configure the aircraft as required for the following environmental and operational conditions:		
	(i) turbulence	2	
	(ii) holding	2	
	(iii) maximum range	2	
A3.2	**Maintain straight and level flight**		
(d)	for the following straight and level manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(v) at maximum range	2	
	(vi) at maximum endurance	2	
C4.2	**Manage fuel system**		
(l)	configure the aircraft correctly to achieve best range performance and correctly calculate the revised range of operation	2	
(m)	configure the aircraft correctly to achieve best endurance performance and correctly calculate the revised operational endurance	2	
NAV.5	**Navigate at low level and in reduced visibility**		
(a)	configure the aircraft as required for the following environmental and operational conditions:		
	(i) reduced visibility	2	
	(ii) low cloud base	2	
(b)	navigate aeroplane at minimum heights (not below 500 ft AGL, clear of built-up areas) and remain in VMC	2	
(c)	maintain separation from terrain, obstacles, allowing for wind and turbulence at low level	2	
(d)	avoid noise sensitive areas	2	
(e)	operate appropriately in the vicinity of aerodromes and landing areas	2	
NAV.7	**Perform diversion procedure**		
(a)	make timely decision to divert	2	
(b)	identify an acceptable alternate aerodrome	2	
(c)	select a suitable route and cruising level	2	
(d)	revise flight plan considering weather, terrain, airspace and fuel available	2	
(e)	advise ATS of an intention to divert	2	
A5.1	**Enter and recover from stall** *(revise incipient stall, stalls from straight & level flight and during climb)*	2	
A5.2	**Recover from incipient spin** *(revise incipient spin from straight and level flight)*	2	
A6.3	**Perform forced landing (simulated)** *(revise simulated partial engine failure)*	2	
A6.4	**Conduct precautionary search and landing (simulated condition)**	2	
A6.5	**Manage other abnormal situations (simulated)** *(simulated electrical failure)*		
(a)	correctly identify the situation and maintain safe control of the aeroplane at all times	2	
(b)	manage abnormal and emergency situations in accordance with relevant emergency procedures and regulatory requirements	2	
(c)	follow appropriate emergency procedures while maintaining control of the aeroplane	2	
(e)	correctly identify when an emergency evacuation of an aeroplane is required	2	

LESSON PLAN AND TRAINING RECORD
CPL (A) 4: NAVIGATION EXERCISE #2

FLIGHT TRAINING Suggested flight time: 2.5 hours dual (0.3 IF)			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	**Performance Standard** **Achieved***
(f)	execute a simulated emergency evacuation of an aeroplane	2	
(g)	advise ATS or other agencies capable of providing assistance of situation and intentions	2	
IFL.4	**Re-establish visual flight** *(simulated inadvertent IMC entry – limited panel)*	3	
NAV.6	**Perform lost procedure**		
(a)	acknowledge positional uncertainty in a timely manner	2	
(b)	configure aircraft for range and endurance as required	2	
(c)	apply recognised method to re-establish aircraft position	2	
(d)	fix position	2	
(e)	use radio to request assistance, if applicable	2	
(f)	plan a timely precautionary search and landing if unable to complete flight safely to suitable aerodrome	2	
CTA.1	**Operate aircraft in controlled airspace**		
(a)	comply with airways clearance requirements for operating in all classes of airspace, including lead time required for flight plan submission, contents, 'clearance void time', and 'readback' requirement	2	
(b)	apply airways clearance requirements for entering, operating in and departing from CTA and CTR, including details that need to be provided to ATC, and what details to expect from ATC	2	
(c)	maintain control area protection tolerances	2	
(d)	maintain tracking and altitude tolerances when operating on an airways clearance	2	
(e)	reconfirm any clearance items when doubt exists	2	
(f)	advise ATC as soon as possible if unable to maintain clearance due to adverse weather conditions	2	
(g)	follow ATC requirements for a change of level in CTA, including in an emergency situation	2	
(h)	comply with departure, climb, transition to cruise (levelling out), cruise, change of levels, descent and visual approach procedures in CTA and CTR instructions	2	
(i)	apply separation standards between IFR flights, and IFR and VFR flights in the various classes of CTA	2	
(j)	perform appropriate actions in the event of the loss of radio communication in CTA and CTR	2	
(k)	perform appropriate actions in the event of abnormal operations and emergency procedures in CTA and CTR	2	
(l)	operate under radar vectoring procedures, including radio procedures and phraseologies	2	
(m)	maximum permissible time interval between ATC transmissions during radar vectoring are not exceeded	2	
(n)	perform appropriate actions in the event of abnormal operations and emergencies	2	
(o)	recall transponder emergency code and communication failure code	2	
CTR.4	**Perform arrival and landing at controlled aerodrome**		
(a)	check ERSA and NOTAM prior to entering control area and extract required operational information	2	
(b)	receive ATIS and correctly set the appropriate QNH	2	
(c)	request and receive ATC clearance and set correct transponder code prior to entering control area	2	
(d)	advise ATC as soon as possible if unable to comply with clearance	2	
(e)	maintain lookout at all times	2	
(f)	update QNH as required	2	
(g)	maintain tracking tolerances	2	
(h)	establish aircraft on the correct leg of the circuit in preparation for landing and maintain separation from traffic	2	
(i)	confirm clearance to land	2	
(j)	vacate runway and obtain taxi clearance	2	

LESSON PLAN AND TRAINING RECORD
CPL (A) 4: NAVIGATION EXERCISE #2

FLIGHT TRAINING **Suggested flight time: 2.5 hours dual (0.3 IF)**			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	**Achieved***
CTR.2	**Taxi aircraft at a controlled aerodrome**		
(a)	obtain and comply with ATC clearances	2	
(b)	manoeuvre aircraft to holding point as instructed and take appropriate action to avoid other aircraft and obstructions	2	
(c)	recognise ground markings during taxi and take appropriate action	2	
(d)	recognise lighting signals and take appropriate action	2	
(e)	identify airport runway incursion hotspots	2	
(f)	manoeuvre aircraft to avoid jet blast hazard	2	
(g)	request taxi guidance if unsure of position	2	
(h)	use strobes when crossing any runway	2	
CTR.3	**Perform departure from controlled aerodrome**		
(a)	receive and correctly read back an airways clearance	2	
(b)	check and ensure runway approach is clear prior to entering a runway	2	
(c)	correctly set transponder code and mode prior to entering runway for take-off	2	
(d)	comply with ATC departure instructions	2	
(e)	advise ATC as soon as possible if unable to comply with clearance	2	
(f)	contact approach with airborne report or give departure call to tower	2	
(g)	maintain lookout	2	
(h)	avoid wake turbulence	2	
(i)	comply with airways clearances within tracking and altitude tolerances and maintain traffic lookout until clear of the aerodrome control zone	2	
NTS1.1	**Maintain effective lookout**		
(a)	maintain traffic separation using a systematic visual scan technique at a rate determined by traffic density, visibility and terrain	**1**	
(b)	maintain radio listening watch and interpret transmissions to determine traffic location and intentions	**1**	
(c)	perform airspace-cleared procedure before commencing any manoeuvre	**1**	
NTS1.2	**Maintain situational awareness**		
(a)	monitor all aircraft systems using a systematic scan technique	2	
(b)	collect information to facilitate ongoing system management	2	
(c)	monitor flight environment for deviations from planned operations	2	
(d)	collect flight environment information to update planned operations	2	
NTS1.3	**Assess situations and make decisions**		
(a)	identify problems	2	
(b)	analyse problems	2	
(c)	identify solutions	2	
(d)	assess solutions and risks	2	
(e)	decide on a course of action	2	
(f)	communicate plans of action (if appropriate)	2	
(g)	allocate tasks for action (if appropriate)	2	
(h)	take actions to achieve optimum outcomes for the operation	2	
(i)	monitor progress against plan	2	

LESSON PLAN AND TRAINING RECORD
CPL (A) 4: NAVIGATION EXERCISE #2

FLIGHT TRAINING **Suggested flight time: 2.5 hours dual (0.3 IF)**			
		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Required**	**Achieved***
(j)	re-evaluate plan to achieve optimum outcomes	2	
NTS1.4	**Set priorities and manage tasks**		
(a)	organise workload and priorities to ensure optimum outcome of the flight	2	
(b)	plan events and tasks to occur sequentially	2	
(c)	anticipate events and tasks to ensure sufficient opportunity for completion	2	
(d)	use technology to reduce workload and improve cognitive and manipulative activities	2	
NTS1.5	**Maintain effective communications and interpersonal relationships**		
(a)	establish and maintain effective and efficient communications and interpersonal relationships with all stakeholders to ensure the optimum outcome of the flight	2	
(b)	define and explain objectives to stakeholders	2	
(c)	demonstrate a level of assertiveness that ensures the optimum completion of the flight	2	
NTS2.1	**Recognise and manage threats**		
(a)	identify relevant environmental or operational threats that are likely to affect the safety of the flight	2	
(b)	identify when competing priorities and demands may represent a threat to the safety of the flight	2	
(c)	develop and implement countermeasures to manage threats	2	
(d)	monitor and assess flight progress to ensure a safe outcome, or modify actions when a safe outcome is not assured	2	
NTS2.2	**Recognise and manage errors**		
(a)	apply checklists and standard operating procedures to prevent aircraft handling, procedural or communication errors	2	
(b)	identify committed errors before safety is affected or the aircraft enters an undesired state	2	
(c)	monitor the following to collect and analyse information to identify potential or actual errors:		
	(i) aircraft systems using a systematic scan technique	2	
	(ii) the flight environment	2	
	(iii) other crew	2	
(d)	implement countermeasures to prevent errors or take action in the time available to correct errors before the aircraft enters an undesired state	2	
NTS2.3	**Recognise and manage undesired aircraft state**		
(a)	recognise an undesired aircraft state	2	
(b)	prioritise tasks to ensure an undesired aircraft state is managed effectively	2	
(c)	apply corrective actions to recover an undesired aircraft state in a safe and timely manner	2	
A6.2	**Manage engine failure in the circuit area (simulated)**	2	
A4.5	**Short landing**	2	
A1.1	**Start and stop engine**		
(c)	manage engine shutdown malfunctions and emergencies *(e.g. inoperative magneto or live magneto on shutdown)*	2	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

LESSON PLAN AND TRAINING RECORD
CPL (A) 4: NAVIGATION EXERCISE #2

CONSOLIDATION AND/OR REMEDIAL TRAINING			
		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

Commercial Pilot Licence – Aeroplane Category Rating

LESSON PLAN AND TRAINING RECORD
CPL (A) 5: NAVIGATION EXERCISE #3 - SOLO

Flight no:	CPL(A)5	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- CPL Navigation Exercise 3 – solo
- Navigation route: YRED – YMYB - KKV – YWND - YRED
- **Suggested flight time: 2.5 hours**

Operational Limitations:

Except in emergency or urgency situations, or in the interests of maintaining safety, the trainee must not operate contrary to the limitations and guidelines specified by the authorising flight instructor.

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

	Commercial Pilot Licence – Aeroplane Category Rating

LESSON PLAN AND TRAINING RECORD
CPL (A) 6: BASIC INSTRUMENT FLIGHT & NAVAID TRAINING

Flight no:	CPL (A) 6.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Basic instrument flight - full and limited panel, including recovery from upset situations and unusual attitudes
- Simulated inadvertent IMC entry and return to visual flight
- Navigation aids and systems
- Abnormal situations – simulated unreliable airspeed indication, simulated electrical failure

PRE-FLIGHT KNOWLEDGE **Long Briefing: as required Pre-flight Briefing: as required** **Underpinning knowledge: as required**	
Content	
Long briefing • Revision as required	
Underpinning knowledge • Tracking tolerances for radio navaids and GNSS aids, NDB, VOR, GNSS theory, limitations, procedures [RNE 4(a)-(f)]	
HF & NTS • As required	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

LESSON PLAN AND TRAINING RECORD
CPL (A) 6: BASIC INSTRUMENT FLIGHT & NAVAID TRAINING

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING **Suggested flight time: 1.7 hours dual (1.5 IF)**				
MOS Reference		**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	**Achieved***
A6.5		**Manage other abnormal situations (simulated)** *(simulated flight with unreliable airspeed indication, simulated electrical failure)*	2	
IFF.1		**Determine and monitor the serviceability of flight instruments and instrument power sources**	2	
IFF.2		**Perform manoeuvres using full instrument panel**	2	
IFF.3		**Recover from upset situations and unusual attitudes**	2	
IFL.1		**Recognise failure of attitude indicator and stabilised heading indicator**	3	
IFL.2		**Perform manoeuvres – limited panel**	3	
IFL.3		**Recover from upset situations and unusual attitudes – limited panel**	3	
IFL.4		**Re-establish visual flight** *revise simulated inadvertent IMC entry – limited panel, compass turns)*	3	
RNE.1		**Operate and monitor radio navigation aids and systems**		
	(a)	select and operate navigation aids and systems	2	
	(b)	monitor and take appropriate action in relation to the integrity of navigation aid systems information	2	
RNE.2		**Navigate the aircraft using navigation aids and systems**		
	(a)	determine aircraft position fix solely with reference to navigation aids and systems	2	
	(b)	intercept tracks to and from navigation aids and systems	2	
	(c)	maintain tracks within specified tolerances	2	
	(e)	recognise station passage	2	

***Enter the performance standard achieved if it is different to that required**
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

LESSON PLAN AND TRAINING RECORD
CPL (A) 6: BASIC INSTRUMENT FLIGHT & NAVAID TRAINING

CONSOLIDATION AND/OR REMEDIAL TRAINING			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** Required	**Performance Standard** Achieved

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

Commercial Pilot Licence – Aeroplane Category Rating

LESSON PLAN AND TRAINING RECORD
CPL (A) 7: NAVIGATION EXERCISE #4

Flight no:	CPL (A) 7.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- CPL Navigation Exercise 4 – Navigation route: YRED - YWND – JIMNA – YBSU - YCDR - YRED
- Simulated commercial exercise, including simulated passenger and cargo management and loading
- Engine start – simulated emergency
- Critical point and point of no return calculations
- 'Short field' take-off and landing
- General handling - stalling, incipient spins
- Practice forced landing – simulated partial engine failure
- Other abnormal situations - simulated electrical fire
- Basic instrument flight
- Radio navigation enroute
- Perform lost procedure

**lesson plan scenario – OCTA (operating base) – CTA – OCTA*

PRE-FLIGHT KNOWLEDGE **Long Briefing: as required Pre-flight Briefing: as required** **Underpinning knowledge: as required**	
Content	
Long briefing • Preparation for and overview of exercise • Revision as required	
Underpinning knowledge • As required	
HF & NTS • As required	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

LESSON PLAN AND TRAINING RECORD
CPL (A) 7: NAVIGATION EXERCISE #4

Performance Standard		
3	2	1
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 2.5 hours dual (0.3 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
NAV.1	**Prepare documents and flight plan**		
(e)	calculate and document critical point (CP) and point of no return (PNR) locations	3	
A1.1	**Start and stop engine**		
(c)	manage engine start malfunctions and emergencies *(e.g. engine fire on start)*	2	
A2.5	**Take off aeroplane from 'short field'**	2	
A5.1	**Enter and recover from stall** *(revise stalls from a descent, approach to land configuration, turning and complete engine failure configuration)*	2	
A5.2	**Recover from incipient spin** *(revise incipient spins from a climb and turning)*	2	
NAV.6	**Perform lost procedure**	2	
A4.5	**Short landing**	2	
A6.5	**Manage other abnormal situations (simulated)** *(simulated electrical fire)*	2	

***Enter the performance standard achieved if it is different to that required**
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CONSOLIDATION AND/OR REMEDIAL TRAINING

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved

LESSON PLAN AND TRAINING RECORD
CPL (A) 7: NAVIGATION EXERCISE #4

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

Commercial Pilot Licence – Aeroplane Category Rating

LESSON PLAN AND TRAINING RECORD
CPL (A) 8: NAVIGATION EXERCISE #5

Flight no:	CPL (A) 8.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- CPL Navigation Exercise 5 – Navigation route: YRED – YBSU – YGAY – YKRY YRED
- Circuits at YGAY or YKRY
- Simulated commercial exercise, including simulated passenger and cargo management and loading
- Critical point and point of no return calculations
- Crosswind take-off and landing (OCTA circuits)
- Revise best endurance, best range configurations and re-calculation of operational endurance
- Revise circuits at OCTA aerodrome, missed approach and missed landing recovery, simulated engine failure in the circuit area
- Navigation at low level
- Perform diversion procedure
- Steep turns
- Practice forced landing, simulated complete engine failure
- Other abnormal situations –CSU and retractable undercarriage
- Use instrument navigation systems
- Basic instrument flight full panel, including unusual attitude recoveries

**lesson plan scenario – OCTA– CTA – OCTA (circuits) - OCTA*

PRE-FLIGHT KNOWLEDGE
Long Briefing: as required Pre-flight Briefing: as required
Underpinning knowledge: as required

Content

Long briefing
- Preparation for and overview of exercise
- Revision as required

Underpinning knowledge
- Basic GNSS principles, enroute GNSS navigation principles [NAV 4 (a),(b)]
- Tracking tolerances for radio navigation and GNSS aids, non-directional beacon (NDB), VOR, GNSS [RNE 4(a)-(d)]

HF & NTS
- As required

LESSON PLAN AND TRAINING RECORD
CPL (A) 8: NAVIGATION EXERCISE #5

PRE-FLIGHT KNOWLEDGE **Long Briefing: as required Pre-flight Briefing: as required** **Underpinning knowledge: as required**
Content
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points

Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 3.0 hours dual (0.3 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved*
NAV.1	**Prepare documents and flight plan**		
(e)	calculate and document critical point (CP) and point of no return (PNR) locations	2	
A2.3	**Take off aeroplane in a crosswind**	2	
C4.2	**Manage fuel system** *Configure for best range performance and best endurance performance, calculate revised endurance for each*	2	
NAV.5	**Navigate at low level and in reduced visibility**	2	
NAV.7	**Perform diversion procedure**	2	
NAV.8	**Use instrument navigation systems**	2	
RNE.1	**Operate and monitor radio navigation aids and systems**	2	
RNE.2	**Navigate the aircraft using navigation aids and systems**	2	
A5.3	**Turn aeroplane steeply** *Steep level turns, steep descending turns*	2	
A6.3	**Perform forced landing (simulated)** *(simulated complete engine failure)*	2	
IFF.1	**Determine and monitor the serviceability of flight instruments and instrument power sources**	2	
IFF.2	**Perform manoeuvres using full instrument panel**	2	
IFF.3	**Recover from upset situations and unusual attitudes**	2	
A6.5	**Manage other abnormal situations (simulated)** *(revise CSU & retractable undercarriage abnormal situations)*	2	

LESSON PLAN AND TRAINING RECORD
CPL (A) 8: NAVIGATION EXERCISE #5

FLIGHT TRAINING Suggested flight time: 3.0 hours dual (0.3 IF)		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved*
A3.6	**Perform circuits and approaches**	2	
A4.3	**Conduct a missed approach**	2	
A4.4	**Perform recovery from missed landing**	2	
A6.2	**Manage engine failure in the circuit area (simulated)**	2	
A4.2	**Land aeroplane in a crosswind**	2	

Enter the performance standard achieved if it is different to that required
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CONSOLIDATION AND/OR REMEDIAL TRAINING		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

LESSON PLAN AND TRAINING RECORD
CPL (A) 8: NAVIGATION EXERCISE #5

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

Commercial Pilot Licence – Aeroplane Category Rating

LESSON PLAN AND TRAINING RECORD
CPL (A) 9: NAVIGATION EXERCISE #6 - SOLO

Flight no:	CPL(A)9	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- CPL Navigation Exercise 6 – solo
- Navigation route: YRED – YKRY – YGAY – YBSU - YRED
- **Suggested flight time: 3.0 hours**

Operational Limitations:

Except in emergency or urgency situations, or in the interests of maintaining safety, the trainee must not operate contrary to the limitations and guidelines specified by the authorising flight instructor.

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

	Commercial Pilot Licence – Aeroplane Category Rating

LESSON PLAN AND TRAINING RECORD
CPL (A) 10: BASIC INSTRUMENT FLIGHT & NAVAID TRAINING

Flight no:	CPL (A) 10.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Basic instrument flight, navigation aids and systems, unusual attitude recoveries, full and limited panel
- Simulated inadvertent entry into IMC and return to visual flight

PRE-FLIGHT KNOWLEDGE **Long Briefing: as required Pre-flight Briefing: as required** **Underpinning knowledge: as required**	
Content	
Long briefing • Revision as required	
Underpinning knowledge • As required	
HF & NTS • As required	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

LESSON PLAN AND TRAINING RECORD
CPL (A) 10: BASIC INSTRUMENT FLIGHT & NAVAID TRAINING

FLIGHT TRAINING
Suggested flight time: 1.8 hours dual (1.5 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved*
IFF.1	Determine and monitor the serviceability of flight instruments and instrument power sources	2	
IFF.2	Perform manoeuvres using full instrument panel	2	
IFF.3	Recover from upset situations and unusual attitudes	2	
IFL.1	Recognise failure of attitude indicator and stabilised heading indicator	2	
IFL.2	Perform manoeuvres – limited panel	2	
IFL.3	Recover from upset situations and unusual attitudes – limited panel	2	
IFL.4	Re-establish visual flight	2	
RNE.1	Operate and monitor radio navigation aids and systems	2	
RNE.2	Navigate the aircraft using navigation aids and systems	2	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved

DEBRIEFING

Content

- Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards
- Recommendations for next lesson (including any carryover/remedial training)
- Trainee preparation for next lesson
- Training record completion and sign off

LESSON PLAN AND TRAINING RECORD
CPL (A) 10: BASIC INSTRUMENT FLIGHT & NAVAID TRAINING

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

Commercial Pilot Licence – Aeroplane Category Rating

LESSON PLAN AND TRAINING RECORD
CPL (A) 11: NAVIGATION EXERCISE #7

Flight no:	CPL (A) 11.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- CPL Navigation Exercise 7 – Navigation route: YRED – YCDR – YNAN – YTLH – YRED
- Simulated commercial exercise, including simulated passenger and cargo management and loading
- Simulated radio failure
- Revise:
  - Stalling, all configurations
  - Incipient spins
  - Practice forced landing, simulated partial engine failure
  - Precautionary search and landing
  - Manage abnormal situations
  - Navigate at low level and in reduced visibility
  - Diversion procedure
- **Assess:**
  - Refuelling
  - Pre-flight actions and procedures, pre-flight inspection
  - Taxiing
  - Communicating face-to-face, operational communication using an aeronautical radio, operate radio equipment, manage R/T equipment malfunctions, operate transponder
  - Post flight actions and procedures

PRE-FLIGHT KNOWLEDGE
Long Briefing: as required Pre-flight Briefing: as required
Underpinning knowledge: as required

Content

Long briefing
- Preparation for and overview of exercise
- Navigation over featureless terrain, extended overwater flights

Underpinning knowledge
- Navigate in featureless terrain and extended over-water flights [NAV 4(d)]
- Other as required

HF & NTS
- As required

Pre-flight briefing
- Review flight sequences, what to expect, see & do
- Check essential knowledge
- Reinforce threat & error management
- Reinforce significant airmanship points

Pre-flight knowledge components complete:	**Instructor's signature & date**

LESSON PLAN AND TRAINING RECORD
CPL (A) 11: NAVIGATION EXERCISE #7

Performance Standard		
3	2	1
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 3.0 hours dual

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
NAV.1	**Prepare documents and flight plan**		
(e)	calculate and document critical point (CP) and point of no return (PNR) locations	2	
C1.1	**Communicating face-to-face**		
(a)	pronounces words clearly, using an accent that does not cause difficulties in understanding	1	
(b)	conveys information in clearly structured sentences without confusion or ambiguity	1	
(c)	uses an extensive vocabulary to accurately communicate on general and technical topics, without excessive use of jargon, slang or colloquial language	1	
(d)	speaks fluently without long pauses, repetition or excessive false starts	1	
(e)	responds to communications with actions that demonstrate that the information has been received and understood	1	
(f)	exchanges information clearly in a variety of situations with both expert and non-expert English speakers while giving and receiving timely and appropriate responses	1	
(g)	uses appropriate techniques to validate communications	1	
C2.1	**Pre-flight actions and procedures**		
(a)	complete all required pre-flight administration documentation	1	
(b)	obtain, interpret and apply information contained in the required pre-flight operational documentation, including the following:		
	(i) minimum equipment list (MEL)	1	
	(ii) maintenance release	1	
	(iii) weather forecasts	1	
	(iv) local observations	1	
	(v) Notice to Airmen (NOTAM)	1	
	(vi) global navigation satellite system (GNSS) receiver autonomous integrity monitoring (RAIM) information	1	
	(vii) En Route Supplement Australia (ERSA)	1	
	(viii) Aeronautical Information Package (AIP)	1	
(c)	identify special aerodrome procedures	1	
(d)	identify all relevant radio and navigation aid facilities to be used during the flight (if applicable)	1	
(e)	determine the suitability of the current and forecast weather conditions for the proposed flight	1	
(g)	determine whether the aircraft is serviceable for the proposed flight	1	
C2.2	**Perform pre-flight inspection**		
(a)	identify and secure equipment and documentation that is required for the flight	1	
(b)	complete an internal and external check of the aircraft	1	
(c)	identify all defects or damage to the aircraft	1	

LESSON PLAN AND TRAINING RECORD
CPL (A) 11: NAVIGATION EXERCISE #7

FLIGHT TRAINING
Suggested flight time: 3.0 hours dual

MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
(d)	report to, and seek advice from, qualified personnel to determine the action required in relation to any identified defects or damage	1	
(e)	ensure all aircraft locking and securing devices, covers and bungs are removed and stowed securely	1	
(f)	certify the aircraft flight technical log entering any defects or endorsements to permissible unserviceabilities as appropriate	1	
(g)	complete and certify the daily inspection (if authorised to do so)	1	
C4.3	**Refuel aircraft**		
(a)	identify the correct type of fuel to be used	1	
(b)	ensure aircraft is earthed prior to refuelling and defueling operations	1	
(c)	correctly load and unload fuel	1	
(d)	ensure required fuel quantity is loaded	1	
(e)	ensure fuel caps are closed and secured after fuelling operations	1	
(f)	perform fuel quality checks	1	
A1.2	**Taxi aeroplane**		
(a)	use aerodrome or landing area charts to taxi aircraft	1	
(b)	comply with taxiway and other aerodrome markings, right-of-way rules and ATC or marshalling instructions when applicable	1	
(c)	perform applicable taxi checks, including the following:		
	(i) brakes and steering function normally and take appropriate action in the event of a malfunction	1	
	(ii) instruments for correct readings	1	
	(iii) altimeter setting	1	
(d)	maintain safe taxi speed and control of the aircraft	1	
(e)	maintain safe spacing from other aircraft, obstructions, and persons	1	
(f)	taxi the aeroplane along the centre of the taxiway	1	
(g)	avoid causing a hazard to other aircraft, objects or persons	1	
(h)	correct handling techniques are applied to take into account wind from all four quadrants	1	
(i)	correctly manage the engine during taxi manoeuvres	1	
C3.1	**Operate radio equipment**		
(a)	confirm serviceability of radio equipment	1	
(b)	conduct transmission and receipt of radio communications using appropriate procedures and phraseology	1	
(c)	maintain a listening watch and respond appropriately to applicable transmissions	1	
(d)	conduct appropriate emergency and urgency transmissions	1	
C1.2	**Operational communication using an aeronautical radio**		
(a)	maintain effective communication with others on operational matters	1	
(b)	communicate effectively in unfamiliar, stressful or non-standard situations	1	
(c)	apply the phonetic alphabet	1	
(d)	transmit numbers	1	
(e)	make appropriate transmissions using standard aviation phraseology	1	
(f)	use plain English effectively when standard phraseology is inadequate	1	
(g)	receive appropriate responses to transmissions	1	
(h)	respond to transmissions and take appropriate action	1	

LESSON PLAN AND TRAINING RECORD
CPL (A) 11: NAVIGATION EXERCISE #7

FLIGHT TRAINING **Suggested flight time: 3.0 hours dual**			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	**Achieved***
(i)	recognise and manage communication errors and misunderstandings effectively	**1**	
(j)	seek clarification in the time available if a message is unclear or uncertainty exists	**1**	
(k)	react appropriately to a variety of regional accents	**1**	
(l)	communicate effectively in unexpected, stressful or non-standard situations using standard phraseology or plain English	**1**	
C3.2	**Manage R/T equipment malfunctions**		
(a)	perform radio failure procedures	**1**	
(b)	use fault finding procedures and perform corrective actions	**1**	
C3.3	**Operate transponder**		
(a)	operate a transponder during normal, abnormal and emergency operations	**1**	
(b)	recall transponder emergency codes	**1**	
A5.1	**Enter and recover from stall** *All configurations*	2	
A5.2	**Recover from incipient spin**	2	
A6.6	**Recover from unusual flight attitudes** *Nose-high unusual attitude flight condition*	2	
A6.3	**Perform forced landing (simulated)** *(simulated partial engine failure)*	2	
A6.4	**Conduct precautionary search and landing (simulated condition)**	2	
A6.5	**Manage other abnormal situations (simulated)** *(e.g. high oil temperature, low oil pressure)*	2	
NAV.5	**Navigate at low level and in reduced visibility**	2	
NAV.7	**Perform diversion procedure**	2	
C2.3	**Post-flight actions and procedures**		
(a)	shut down aircraft	**1**	
(b)	conduct post-flight inspection and secure the aircraft (if applicable)	**1**	
(c)	complete all required post-flight administration documentation	**1**	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

LESSON PLAN AND TRAINING RECORD
CPL (A) 11: NAVIGATION EXERCISE #7

CONSOLIDATION AND/OR REMEDIAL TRAINING		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

Commercial Pilot Licence – Aeroplane Category Rating

LESSON PLAN AND TRAINING RECORD
CPL (A) 12: NAVIGATION EXERCISE #8

Flight no:	CPL (A) 12.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- CPL Navigation Exercise 8 – Navigation route: YRED YMDA YBSU YCAB YRED
- Simulated commercial exercise, including simulated passenger and cargo management and loading
- Revise:
  - 'Short field' take-off and landing
  - Simulated engine failure on take-off, simulated engine failure in the circuit area
  - Best range and best endurance configurations
  - Steep turning
  - Sideslipping
  - Practice forced landing, simulated complete engine failure
  - Basic instrument flight, navigation aids and systems, unusual attitude recoveries, full and limited panel
  - Simulated inadvertent IMC entry and return to visual flight
  - Lost procedure
  - Circuits (at base aerodrome following navigation exercise)
- **Assess**:
  - Refuelling
  - Pre-flight actions and procedures, pre-flight inspection
  - Taxiing
  - Communicating face-to-face, operational communication using an aeronautical radio, operate radio equipment, manage R/T equipment malfunctions, operate transponder
  - Local area airspace
  - Post flight actions and procedures

**lesson plan scenario – OCTA– training area for assessment of local area airspace & general handling exercises -CTA – OCTA (circuits on return to operating base)*

PRE-FLIGHT KNOWLEDGE **Long Briefing: as required Pre-flight Briefing: as required** **Underpinning knowledge: as required**
Content
Long briefing • Preparation for and overview of exercise • Revision as required
Underpinning knowledge • As required
HF & NTS • As required

LESSON PLAN AND TRAINING RECORD
CPL (A) 12: NAVIGATION EXERCISE #8

PRE-FLIGHT KNOWLEDGE **Long Briefing: as required Pre-flight Briefing: as required** **Underpinning knowledge: as required**	
Content	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 3.5 hours dual (0.4 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
NAV.1	**Prepare documents and flight plan**		
(e)	calculate and document critical point (CP) and point of no return (PNR) locations	2	
A3.7	**Local area airspace**		
(a)	using an appropriate chart, for the local area and circuit area:		
	(i) identify geographical features	1	
	(ii) identify geographical limits	1	
	(iii) identify restricted, controlled and uncontrolled airspace areas	1	
	(iv) state local airspace limits	1	
	(v) identify the transit route between the departure aerodrome and training area	1	
	(vi) identify the geographical limits of the training area	1	
	(vii) identify aerodromes and landing areas within the local area	1	
C1.1	**Communicating face-to-face**	1	
C2.1	**Pre-flight actions and procedures**	1	
C2.2	**Perform pre-flight inspection**	1	
C4.3	**Refuel aircraft**	1	

LESSON PLAN AND TRAINING RECORD
CPL (A) 12: NAVIGATION EXERCISE #8

FLIGHT TRAINING **Suggested flight time: 3.5 hours dual (0.4 IF)**			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard** **Required**	**Achieved***
A1.2	**Taxi aeroplane**	1	
A6.1	**Manage engine failure - take-off** (simulated)	2	
A2.5	**Take off aeroplane from 'short field'**	2	
C3.1	**Operate radio equipment**	1	
C1.2	**Operational communication using an aeronautical radio**	1	
C3.2	**Manage R/T equipment malfunctions**	1	
C3.3	**Operate transponder**	1	
A3.7	**Local area airspace**		
(b)	maintain orientation and pinpoint location by using geographical features and a local area chart	1	
(c)	transit from the circuit area and transit to the designated training area	1	
(d)	operate safely within a transit lane (if applicable)	1	
(e)	remain clear of restricted, controlled and other appropriately designated airspace	1	
(f)	operate safely in the vicinity of local aerodromes and landing areas	1	
(g)	transit from the designated training area to the circuit area	1	
(h)	set QNH appropriately	1	
(i)	correctly determine which runway is to be used for landing	1	
(j)	ensure runway is serviceable and available	1	
(k)	position aircraft for arrival into the circuit	1	
A5.3	**Turn aeroplane steeply**	2	
A5.4	**Sideslip aeroplane** (where flight manual permits) *Straight sideslip and sideslipping turn*	2	
C4.2	**Manage fuel system** *Configure for best range performance and best endurance performance, calculate revised endurance for each*	2	
A6.3	**Perform forced landing** (simulated) *(simulated complete engine failure)*	2	
IFF.1	**Determine and monitor the serviceability of flight instruments and instrument power sources**	2	
IFF.2	**Perform manoeuvres using full instrument panel**	2	
IFF.3	**Recover from upset situations and unusual attitudes**	2	
IFL.1	**Recognise failure of attitude indicator and stabilised heading indicator**	2	
IFL.2	**Perform manoeuvres – limited panel**	2	
IFL.3	**Recover from upset situations and unusual attitudes – limited panel**	2	
IFL.4	**Re-establish visual flight**	2	
NAV.6	**Perform lost procedure**	2	
A3.6	**Perform circuits and approaches**	2	
A4.3	**Conduct a missed approach**	2	
A4.4	**Perform recovery from missed landing**	2	
A6.2	**Manage engine failure in the circuit area** (simulated)	2	
A4.5	**Short landing**	2	
C2.3	**Post-flight actions and procedures**	1	

LESSON PLAN AND TRAINING RECORD
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***Enter the performance standard achieved if it is different to that required**
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING			
		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

Commercial Pilot Licence – Aeroplane Category Rating

LESSON PLAN AND TRAINING RECORD
CPL (A) 13: GENERAL HANDLING - SOLO

Flight no:	CPL(A)13	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- **General handling - solo**
- **Suggested flight time: 1.5 hours**

Operational Limitations:

Except in emergency or urgency situations, or in the interests of maintaining safety, the trainee must not operate contrary to the limitations and guidelines specified by the authorising flight instructor.

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

Commercial Pilot Licence – Aeroplane Category Rating

LESSON PLAN AND TRAINING RECORD
CPL (A) 14: NAVIGATION EXERCISE #9 - SOLO

Flight no:	CPL(A) 14	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- CPL Navigation Exercise 9 – solo
- Navigation route: YRED – YBSU – YMDA – YKRY – YRED
- **Suggested flight time: 3.5 hours**

Operational Limitations:

Except in emergency or urgency situations, or in the interests of maintaining safety, the trainee must not operate contrary to the limitations and guidelines specified by the authorising flight instructor.

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

Commercial Pilot Licence – Aeroplane Category Rating

LESSON PLAN AND TRAINING RECORD
CPL (A) 15: NAVIGATION EXERCISE #10

Flight no:	CPL (A) 15.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- CPL Navigation Exercise 10 – Navigation route: YRED – YBAF – YBCG – YBOA – YRED
- Simulated commercial exercise, including simulated passenger and cargo management and loading
- Basic instrument flight – general revision enroute
- **Assess**:
  - Pre-flight preparation, prepare documents and flight plan, weight and balance, take-off and landing performance and fuel calculations
  - Plan fuel requirements, manage fuel system
  - Manage, aid and assist passengers, manage cargo
  - Stalling, incipient spins, steep turns, sideslipping
  - Practice forced landing (simulated complete and partial engine failures)
  - Precautionary search and landing (enroute OCTA aerodrome)
  - Other abnormal situations (e.g. unreliable airspeed, electrical failure, engine fire, undercarriage malfunction)
  - Unusual flight attitude recoveries
  - Departure and arrival procedures, navigation procedures, Class G, CTA and CTR procedures
  - Flight manoeuvres to be performed within the flight tolerances for the professional level, mentioned in table 2, Schedule 8 of the Part 61 MOS

**lesson plan scenario – OCTA– CTA - CTA– OCTA*

PRE-FLIGHT KNOWLEDGE
Long Briefing: as required   Pre-flight Briefing: as required
Underpinning knowledge: as required

Content

Long briefing
- Preparation for and overview of exercise
- Revision as required

Underpinning knowledge
- As required

HF & NTS
- As required

Pre-flight briefing
- Review flight sequences, what to expect, see & do
- Check essential knowledge
- Reinforce threat & error management
- Reinforce significant airmanship points

Pre-flight knowledge components complete:	**Instructor's signature & date**

LESSON PLAN AND TRAINING RECORD
CPL (A) 15: NAVIGATION EXERCISE #10

Performance Standard		
3	2	1
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 3.5 hours dual (0.4 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
ONTA.1	**Non-towered aerodrome – pre-flight preparation**		
(a)	using a current ERSA and NOTAM, for the non-towered aerodrome or landing area, extract all of the relevant operational information	1	
(b)	interpret the extracted information	1	
(c)	identify all special aerodrome procedures	1	
(d)	check current weather forecast and local observations	1	
(e)	identify all relevant radio and navigation aid frequencies	1	
CTR.1	**Controlled aerodrome pre-flight preparation**		
(a)	using a current ERSA and NOTAM, for the controlled aerodrome, extract all the relevant operational information	1	
(b)	interpret the extracted information	1	
(c)	identify all special aerodrome procedures	1	
(d)	check current weather forecast and local observations	1	
(e)	identify all relevant radio and navigation aid frequencies	1	
NAV.1	**Prepare documents and flight plan**		
(a)	select and prepare appropriate navigation charts for the intended flight	1	
(b)	select a suitable route and altitude considering weather, terrain, airspace, NOTAMs and alternate landing areas	1	
(c)	obtain and interpret meteorological forecasts, NOTAMs and operational information applicable to the planned flight	1	
(d)	determine whether the planned flight can be conducted under the applicable flight rules and taking account of the beginning and end of daylight times	1	
(e)	calculate and document critical point (CP) and point of no return (PNR) locations	1	
(f)	complete a flight plan to the planned destination and alternates	1	
(g)	lodge suitable flight notification for search and rescue (SAR) purposes	1	
C2.1	**Pre-flight actions and procedures**		
(f)	using the aircraft documents, calculate the following for a given set of environmental and operational conditions:		
	(i) weight and balance	1	
	(iii) take-off and landing performance	1	
	(iv) fuel requirements	1	
C4.1	**Plan fuel requirements**		
(a)	determine the required fuel reserves	1	
(b)	determine the quantity of fuel required taking into account operational requirements and relevant abnormal or emergency conditions and contingencies	1	
(c)	determine the total fuel required for the flight	1	

LESSON PLAN AND TRAINING RECORD
CPL (A) 15: NAVIGATION EXERCISE #10

FLIGHT TRAINING Suggested flight time: 3.5 hours dual (0.4 IF)			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved*
C4.2	**Manage fuel system**		
(a)	verify fuel quantity on-board aircraft prior to flight using two independent methods	1	
(b)	ensure the fuel caps are secured	1	
(c)	perform fuel quality check prior to flight	1	
(d)	ensure fuel drain cocks are closed	1	
C5.1	**Manage passengers**		
(a)	supervise passenger safety	1	
(b)	encourage passengers to participate in and contribute to the safe outcome of the flight	1	
(c)	conduct pre-flight passenger safety briefing	1	
(d)	ensure passengers are aware of, and avoid interference with, flight and systems controls	1	
(e)	ensure passengers are aware of, and comply with, the use of seat harnesses	1	
(f)	ensure passengers are aware of the use of escape hatches, exits and emergency equipment on board the aircraft	1	
(g)	manage passenger safety in the event of abnormal or in-flight emergency situations	1	
C5.2	**Aid and assist passengers**		
(a)	establish and maintain clear communications with passengers	1	
(b)	assist with passenger comfort both when airside and in flight	1	
C5.3	**Manage cargo**		
(a)	manage loading, unloading and security of cargo during flight operations	1	
(b)	identify dangerous goods and apply procedures to ensure safety and security	1	
ONTA.2	**Taxi aircraft at a non-towered aerodrome or landing area**		
(a)	refer to aerodrome or landing area chart (if available)	1	
(b)	set local QNH or area QNH	1	
(c)	broadcast intentions on appropriate frequency	1	
(d)	obtain and interpret traffic information	1	
(e)	maintain lookout for, and separation from, other aircraft, wildlife and other obstructions	1	
(f)	recognise ground markings during taxi and take appropriate action	1	
(h)	taxi aircraft to holding point	1	
(i)	use strobes when crossing any runway	1	
ONTA.3	**Perform departure at a non-towered aerodrome or landing area**		
(a)	check and ensure runway approach is clear prior to entering a runway	1	
(b)	correctly set transponder code and mode prior to entering runway for take-off	1	
(c)	confirm runway approaches clear in all directions prior to entering runway	1	
(d)	broadcast line up details	1	
(f)	transmit appropriate radio calls and maintain separation with other aircraft	1	
(g)	advise air service provider of departure details, if required	1	
(h)	conduct departure	1	
NAV.3	**Conduct departure procedures**		
(a)	organise cockpit to ensure charts, documentation and navigational calculator are accessible from the control seat	1	
(b)	comply with all departure procedures, clearances and noise abatement requirements	1	
(c)	establish planned track on departure within 5 nm of airfield or apply alternative procedure if required	1	

LESSON PLAN AND TRAINING RECORD
CPL (A) 15: NAVIGATION EXERCISE #10

FLIGHT TRAINING
Suggested flight time: 3.5 hours dual (0.4 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
(d)	calculate estimated time of arrival (ETA) for first waypoint	1	
NAV.2	**Comply with airspace procedures while navigating**		
(a)	identify airspace restrictions and dimensions applicable to the flight	1	
(b)	obtain and comply with air traffic clearances, if applicable	1	
(c)	comply with airspace procedures applicable to the airspace classification throughout the flight	1	
NAV.4	**Navigate aircraft enroute**		
(a)	maintain a navigation cycle that ensures accurate tracking, and apply track correctional techniques to re-establish track prior to waypoint or destination	1	
(b)	maintain heading to achieve a nominated track	1	
(c)	maintain and revise ETAs (±2 minutes) for waypoint or destination	1	
(d)	maintain track in accordance with published flight path tolerances in controlled airspace	1	
(e)	navigate using accepted map-reading techniques	1	
(f)	maintain navigation and fuel log to monitor tracking, ETAs and fuel status	1	
(g)	use appropriate techniques to obtain a positive fix at suitable intervals	1	
(h)	maintain awareness of route, enroute terrain, enroute and destination weather, and react appropriately to changing weather conditions	1	
(i)	perform pre-descent and turning point checks	1	
(j)	maintain appropriate radio communication and listening watch with ATS and other aircraft if radio is fitted and used	1	
(k)	configure the aircraft as required for the following environmental and operational conditions:		
	(i) turbulence	1	
	(ii) holding	1	
	(iii) maximum range	1	
(l)	maintain awareness of search and rescue times (SARTIME) and revise as required	1	
(m)	monitor aircraft systems, manage fuel and engine to ensure aircraft is operated to achieve flight plan objectives	1	
OGA	**Operate aircraft in Class G airspace**		
(a)	maintain tracking and altitude tolerances to remain outside controlled airspace	1	
(b)	apply separation tolerances between IFR flights, and IFR and VFR flights	1	
(c)	when using an aircraft radio:		
	(i) monitor appropriate radio frequency	1	
	(ii) make appropriate radio calls	1	
	(iii) obtain operational information from air services provider and other aircraft	1	
	(iv) use information to ensure aircraft separation is maintained	1	
	(v) apply loss of radio communication procedures	1	
(d)	using a suitable chart:		
	(i) operate clear of active aerodromes and landing areas in the vicinity of the aircraft	1	
	(ii) identify and remain clear of controlled and restricted airspace	1	
	(iii) take appropriate action when operating in the vicinity of a danger area	1	
(e)	perform actions in the event of abnormal operations and emergencies	1	
(f)	recall transponder emergency code and communication failure code	1	
C4.2	**Manage fuel system**		
(e)	monitor fuel usage during the flight	1	

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CPL (A) 15: NAVIGATION EXERCISE #10

FLIGHT TRAINING
Suggested flight time: 3.5 hours dual (0.4 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
(f)	accurately maintain fuel log	1	
(g)	calculate and state endurance at any point during flight	1	
(h)	perform fuel tank changes correctly	1	
(i)	maintain fuel load within aircraft limits	1	
(j)	operate the fuel cross-feed system correctly (if fitted)	1	
(k)	operate fuel pumps and engine controls correctly	1	
(l)	configure the aircraft correctly to achieve best range performance and correctly calculate the revised range of operation	1	
(m)	configure the aircraft correctly to achieve best endurance performance and correctly calculate the revised operational endurance	1	
A5.1	**Enter and recover from stall**		
(a)	perform pre-manoeuvre checks for stalling	1	
(b)	recognise stall signs and symptoms	1	
(c)	control the aeroplane by applying the required pitch, roll and yaw inputs as appropriate in a smooth, coordinated manner, trim aeroplane accurately to enter and recover from the following manoeuvres:		
	(i) incipient stall	1	
	(ii) stall with full power applied	1	
	(iii) stall without power applied	1	
	(iv) stall under the following conditions:		
	(A) straight and level flight	1	
	(B) climbing	1	
	(C) descending	1	
	(D) approach to land configuration	1	
	(E) turning	1	
(d)	perform stall recovery as follows:		
	(i) positively reduce angle of attack	1	
	(ii) use power available and excess height to increase the aircraft energy state	1	
	(iii) minimise height loss for simulated low altitude condition	1	
	(iv) re-establish desired flight path and aircraft control	1	
(e)	recover from stall in simulated partial and complete engine failure configurations	1	
A5.2	**Recover from incipient spin**		
(a)	perform pre-manoeuvre checks for an incipient spin	1	
(b)	recognise an incipient spin	1	
(c)	use the aeroplane's attitude and power controls to execute an incipient spin manoeuvre from the following flight conditions and, using correct recovery technique, regain straight and level flight with height loss commensurate with the available altitude (simulated ground base height may be set):		
	(i) straight and level flight	1	
	(ii) climbing	1	
	(iii) turning	1	
A5.3	**Turn aeroplane steeply**		
(a)	pre-manoeuvre checks for steep turning	1	
(b)	steep level turn using a nominated bank angle, ending on a nominated heading or geographical feature, without altitude change	1	

LESSON PLAN AND TRAINING RECORD
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FLIGHT TRAINING
Suggested flight time: 3.5 hours dual (0.4 IF)

MOS Reference		Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved*
	(c)	steep descending turn using a nominated bank angle, ending on a nominated heading or geographical feature ending on a nominated altitude	1	
	(d)	aeroplane operating limits are not exceeded	1	
A5.4		**Sideslip aeroplane (where flight manual permits)**		
	(a)	straight sideslip:		
		(i) induce slip to achieve increased rate of descent while maintaining track and airspeed	1	
		(ii) adjust rate of descent by coordinating angle of bank and applied rudder	1	
	(b)	sideslipping turn by adjusting the bank angle to turn through minimum heading change of 90° at constant airspeed using sideslip, and exiting the turn on a specified heading or geographical feature, within tolerance	1	
	(c)	recover from a sideslip and return the aeroplane to balanced flight	1	
A6.6		**Recover from unusual flight attitudes**		
	(a)	identify nose-high or nose-low unusual attitude flight condition	1	
	(b)	recover from nose-low or nose-high unusual attitudes by adjusting pitch, bank and power to resume controlled and balanced flight	1	
	(c)	apply controlled corrective action while maintaining aircraft performance within limits	1	
A6.3		**Perform forced landing (simulated)**		
	(a)	after a simulated complete engine failure has occurred, without prior indications, carry out the following:		
		(i) identify complete power failure condition and control aeroplane	1	
		(ii) perform immediate actions	1	
		(iii) formulate and describe a recovery plan, including selecting the most suitable landing area	1	
		(iv) establish optimal gliding flight path to position the aeroplane for a landing on the selected landing area	1	
		(v) perform emergency procedures and land the aeroplane if the engine cannot be restarted as time permits	1	
		(vi) advise ATS or other agencies capable of providing assistance of situation and intentions	1	
		(vii) re-brief passengers about flight situation, brace position and harness security	1	
		(viii) land the aeroplane ensuring safest outcome if an engine restart is not achieved	1	
	(b)	after a simulated partial engine failure has occurred, without prior indications, carry out the following:		
		(i) identify partial power failure condition	1	
		(ii) perform recall actions	1	
		(iii) adjust flight controls to re-establish flight path that maximises performance for partial power condition and maintain a safe airspeed margin above stall speed	1	
		(iv) establish radio communications where possible	1	
		(v) perform partial engine failure actions	1	
		(vi) formulate a plan to recover aeroplane to a safe landing area or aerodrome, taking into account that partial failure might lead to a full power failure at any time	1	
		(vii) manoeuvre the aeroplane to a selected landing area or aerodrome using the remaining power to establish an optimal aircraft position for a safe landing	1	
		(viii) advise ATS or other agencies capable of providing assistance of situation and intentions	1	
		(ix) re-brief passengers about flight situation, brace position and harness security	1	
		(x) maintain a contingency plan for coping with a full power failure throughout the manoeuvre	1	
		(xi) when a safe landing position is established, shut down and secure engine and aeroplane	1	
NAV.5		**Navigate at low level and in reduced visibility**		
	(a)	configure the aircraft as required for the following environmental and operational conditions:		
		(i) reduced visibility	1	

LESSON PLAN AND TRAINING RECORD
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FLIGHT TRAINING Suggested flight time: 3.5 hours dual (0.4 IF)			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
	(ii) low cloud base	1	
(b)	navigate aeroplane at minimum heights (not below 500 ft AGL, clear of built-up areas) and remain in VMC	1	
(c)	maintain separation from terrain, obstacles, allowing for wind and turbulence at low level	1	
(d)	avoid noise sensitive areas	1	
(e)	operate appropriately in the vicinity of aerodromes and landing areas	1	
NAV.6	**Perform lost procedure**		
(a)	acknowledge positional uncertainty in a timely manner	1	
(b)	configure aircraft for range and endurance as required	1	
(c)	apply recognised method to re-establish aircraft position	1	
(d)	fix position	1	
(e)	use radio to request assistance, if applicable	1	
(f)	plan a timely precautionary search and landing if unable to complete flight safely to suitable aerodrome	1	
A6.4	**Conduct precautionary search and landing (simulated condition)**		
(a)	assess flight circumstances and make an appropriate decision when to perform precautionary landing	1	
(b)	configure aeroplane for conditions	1	
(c)	perform precautionary search procedure	1	
(d)	select landing area, carry out an inspection and assess its suitability for landing, taking into account:		
	(i) unobstructed approach and overshoot paths	1	
	(ii) landing area length adequate for landing	1	
	(iii) landing area surface is suitable for aeroplane type and clear of hazards	1	
(e)	maintain orientation and visual contact with the landing area	1	
(f)	advise ATS or other agencies capable of providing assistance of situation and intentions	1	
(g)	re-brief passengers about flight situation, brace position and harness security	1	
(h)	land and secure aircraft and manage passengers	1	
NAV.7	**Perform diversion procedure**		
(a)	make timely decision to divert	1	
(b)	identify an acceptable alternate aerodrome	1	
(c)	select a suitable route and cruising level	1	
(d)	revise flight plan considering weather, terrain, airspace and fuel available	1	
(e)	advise ATS of an intention to divert	1	
NAV.8	**Use instrument navigation systems**		
(a)	initialise navigation system (as applicable)	1	
(b)	conduct navigation system validity check (as applicable)	1	
(c)	conduct RAIM check if required	1	
(d)	select, load, check and activate the flight plan (as applicable)	1	
(e)	navigate on departure, enroute and on arrival using GNSS	1	
(f)	operate instrument navigation systems correctly	1	
(g)	use instrument navigation systems to assist with navigation	1	
(h)	confirm waypoints and fixes using instrument navigation systems	1	

LESSON PLAN AND TRAINING RECORD
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FLIGHT TRAINING Suggested flight time: 3.5 hours dual (0.4 IF)			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard Required	 Achieved*
A6.5	**Manage other abnormal situations (simulated)**		
(a)	correctly identify the situation and maintain safe control of the aeroplane at all times	1	
(b)	manage abnormal and emergency situations in accordance with relevant emergency procedures and regulatory requirements	1	
(c)	follow appropriate emergency procedures while maintaining control of the aeroplane	1	
(d)	identify and conduct flight with an unreliable airspeed indication	1	
(e)	correctly identify when an emergency evacuation of an aeroplane is required	1	
(f)	execute a simulated emergency evacuation of an aeroplane	1	
(g)	advise ATS or other agencies capable of providing assistance of situation and intentions	1	
CTA.1	**Operate aircraft in controlled airspace**		
(a)	comply with airways clearance requirements for operating in all classes of airspace, including lead time required for flight plan submission, contents, 'clearance void time', and 'readback' requirement	1	
(b)	apply airways clearance requirements for entering, operating in and departing from CTA and CTR, including details that need to be provided to ATC, and what details to expect from ATC	1	
(c)	maintain control area protection tolerances	1	
(d)	maintain tracking and altitude tolerances when operating on an airways clearance	1	
(e)	reconfirm any clearance items when doubt exists	1	
(f)	advise ATC as soon as possible if unable to maintain clearance due to adverse weather conditions	1	
(g)	follow ATC requirements for a change of level in CTA, including in an emergency situation	1	
(h)	comply with departure, climb, transition to cruise (levelling out), cruise, change of levels, descent and visual approach procedures in CTA and CTR instructions	1	
(i)	apply separation standards between IFR flights, and IFR and VFR flights in the various classes of CTA	1	
(j)	perform appropriate actions in the event of the loss of radio communication in CTA and CTR	1	
(k)	perform appropriate actions in the event of abnormal operations and emergency procedures in CTA and CTR	1	
(l)	operate under radar vectoring procedures, including radio procedures and phraseologies	1	
(m)	maximum permissible time interval between ATC transmissions during radar vectoring are not exceeded	1	
(n)	perform appropriate actions in the event of abnormal operations and emergencies	1	
(o)	recall transponder emergency code and communication failure code	1	
CTR.4	**Perform arrival and landing at controlled aerodrome**		
(a)	check ERSA and NOTAM prior to entering control area and extract required operational information	1	
(b)	receive ATIS and correctly set the appropriate QNH	1	
(c)	request and receive ATC clearance and set correct transponder code prior to entering control area	1	
(d)	advise ATC as soon as possible if unable to comply with clearance	1	
(e)	maintain lookout at all times	1	
(f)	update QNH as required	1	
(g)	maintain tracking tolerances	1	
(h)	establish aircraft on the correct leg of the circuit in preparation for landing and maintain separation from traffic	1	
(i)	confirm clearance to land	1	
(j)	vacate runway and obtain taxi clearance	1	
CTR.2	**Taxi aircraft at a controlled aerodrome**		
(a)	obtain and comply with ATC clearances	1	

LESSON PLAN AND TRAINING RECORD
CPL (A) 15: NAVIGATION EXERCISE #10

FLIGHT TRAINING
Suggested flight time: 3.5 hours dual (0.4 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
(b)	manoeuvre aircraft to holding point as instructed and take appropriate action to avoid other aircraft and obstructions	1	
(c)	recognise ground markings during taxi and take appropriate action	1	
(d)	recognise lighting signals and take appropriate action	1	
(e)	identify airport runway incursion hotspots	1	
(f)	manoeuvre aircraft to avoid jet blast hazard	1	
(g)	request taxi guidance if unsure of position	1	
(h)	use strobes when crossing any runway	1	
CTR.3	**Perform departure from controlled aerodrome**		
(a)	receive and correctly read back an airways clearance	1	
(b)	check and ensure runway approach is clear prior to entering a runway	1	
(c)	correctly set transponder code and mode prior to entering runway for take-off	1	
(d)	comply with ATC departure instructions	1	
(e)	advise ATC as soon as possible if unable to comply with clearance	1	
(f)	contact approach with airborne report or give departure call to tower	1	
(g)	maintain lookout	1	
(h)	avoid wake turbulence	1	
(i)	comply with airways clearances within tracking and altitude tolerances and maintain traffic lookout until clear of the aerodrome control zone	1	
ONTA.4	**Perform arrival and landing at a non-towered aerodrome or landing area**		
(a)	check ERSA and NOTAM prior to entering circuit area	1	
(b)	set correct area or local QNH	1	
(c)	use correct radio frequency to transmit inbound calls as required	1	
(d)	maintain effective lookout	1	
(e)	maintain aircraft separation and avoid other traffic	1	
(f)	maintain tracking tolerances	1	
(g)	determine wind velocity	1	
(h)	determine landing direction	1	
(i)	confirm runway is serviceable for the operation	1	
(j)	determine circuit direction	1	
(k)	conduct landing area inspection (if applicable)	1	
(l)	position aircraft in the circuit in preparation for landing and maintain separation from traffic	1	
(m)	make all necessary circuit radio calls	1	
(n)	verify runway is clear of other traffic, wildlife and other obstructions	1	
(o)	land the aircraft	1	
(p)	vacate runway	1	
(q)	cancel SARWATCH, if applicable	1	
NAV.9	**Execute arrival procedures**		
(a)	obtain updated relevant aerodrome information	1	
(b)	determine landing direction and aerodrome suitability	1	
(c)	conduct arrival	1	

LESSON PLAN AND TRAINING RECORD
CPL (A) 15: NAVIGATION EXERCISE #10

FLIGHT TRAINING Suggested flight time: 3.5 hours dual (0.4 IF)			
MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
(d)	identify and avoid all traffic	1	
(e)	observe local and published noise abatement requirements and curfews	1	
(f)	cancel SARWATCH	1	

***Enter the performance standard achieved if it is different to that required**
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING			
MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Achieved

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

	LESSON PLAN AND TRAINING RECORD **CPL (A) 15: NAVIGATION EXERCISE #10**

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	**Trainee's signature & date**

Commercial Pilot Licence – Aeroplane Category Rating

LESSON PLAN AND TRAINING RECORD
CPL (A) 16: GENERAL HANDLING, BASIC INSTRUMENT FLIGHT & NAVAID TRAINING

Flight no:	CPL (A) 16.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview

- **Assess:**
  - Start and stop engine including malfunctions and emergencies, carry out pre-take-off checks
  - Take off aeroplane including in a crosswind and from 'short field', simulated engine failure on take-off, carry out after take-off procedures
  - Climbing, straight and level, descending, turning
  - Circuits and approaches, landings including crosswind and 'short field', missed approach and recovery from missed landing, simulated engine failure in the circuit area
  - Slow flight, stalling, incipient spin recoveries, steep turns, sideslipping
  - Unusual attitude recoveries
  - Precautionary search and landing
  - Basic instrument flight, full and limited panel, navigation using navigation aids and systems
  - Non-technical skills
  - Flight manoeuvres to be performed within the flight tolerances for the professional level, mentioned in table 2, Schedule 8 of the Part 61 MOS

PRE-FLIGHT KNOWLEDGE **Long Briefing: as required Pre-flight Briefing: as required** **Underpinning knowledge: as required**	
Content	
Long briefing • Revision as required	
Underpinning knowledge • As required	
HF & NTS • As required	
Pre-flight briefing • Review flight sequences, what to expect, see & do • Check essential knowledge • Reinforce threat & error management • Reinforce significant airmanship points	
Pre-flight knowledge components complete:	**Instructor's signature & date**

LESSON PLAN AND TRAINING RECORD
CPL (A) 16: GENERAL HANDLING, BASIC INSTRUMENT FLIGHT & NAVAID TRAINING

Performance Standard		
3	2	1
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

FLIGHT TRAINING
Suggested flight time: 2.5 hours dual (1.3 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
IFF.1	**Determine and monitor the serviceability of flight instruments and instrument power sources**		
(a)	determine serviceability of flight and navigational instruments	1	
(b)	perform functional checks of flight and navigational instruments where applicable prior to take-off	1	
A2.1	**Carry out pre take-off procedures**		
(a)	correctly identify critical airspeeds, configurations, and emergency and abnormal procedures for normal and crosswind take-offs	1	
(b)	work out a plan of action, in advance, to ensure the safest outcome in the event of abnormal operations	1	
(c)	verify and correctly apply correction for the existing wind component to the take-off performance	1	
(d)	perform all pre take-off and line-up checks required by the aircraft checklist	1	
(e)	ensure approach path is clear of conflicting traffic and other hazards before lining up for take-off	1	
(f)	align the aeroplane on the runway centreline	1	
A1.1	**Start and stop engine**		
(a)	perform engine start and after start actions	1	
(c)	manage engine start malfunctions and emergencies	1	
(d)	considers ground surface in relation to contamination and propeller care during engine start activities	1	
A2.2	**Take off aeroplane**		
(a)	apply the controls correctly to maintain longitudinal alignment on the centreline of the runway, if appropriate, prior to initiating and during the take-off	1	
(b)	adjust the power controls taking into account the existing conditions	1	
(c)	monitor power controls, settings, and instruments during take-off to ensure all predetermined parameters are achieved and maintained	1	
(d)	adjust the controls to attain the desired pitch attitude at the predetermined airspeed to attain the desired performance	1	
(e)	perform the take-off applying the required pitch, roll and yaw inputs as appropriate in a smooth, coordinated manner	1	
(f)	trim the aeroplane accurately	1	
(g)	perform gear and flap retractions, power adjustments (as applicable) and other required pilot-related activities	1	
(h)	maintain flight path along the runway extended centreline	1	
(i)	apply the applicable noise abatement and wake turbulence avoidance procedures	1	
(j)	recognise take-off abnormalities and take appropriate action to reject take-off (can be simulated)	1	
A6.1	**Manage engine failure - take-off (simulated)**		
(a)	correctly identify an engine failure after take-off	1	
(b)	apply the highest priority to taking action to control the aeroplane	1	

LESSON PLAN AND TRAINING RECORD
CPL (A) 16: GENERAL HANDLING, BASIC INSTRUMENT FLIGHT & NAVAID TRAINING

FLIGHT TRAINING
Suggested flight time: 2.5 hours dual (1.3 IF)

MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved*
(c)	maintain control of the aeroplane	1	
(d)	perform recall actions	1	
(e)	perform emergency actions as far as time permits	1	
(f)	manoeuvre the aeroplane to achieve the safest possible outcome	1	
(g)	ensure passengers adopt brace position	1	
(h)	advise others such as ATS and other aircraft of intentions if time permits	1	
A2.3	**Take off aeroplane in a crosswind**		
(a)	perform a take-off in an aeroplane making appropriate adjustments for the crosswind conditions	1	
(b)	maintain the runway centreline and extended centreline	1	
A2.5	**Take off aeroplane from 'short field'**		
(a)	calculate take-off and landing performance in accordance with the aeroplane's performance charts	1	
(b)	perform take-off aeroplane to achieve the minimum length take-off performance	1	
(c)	perform take-off aeroplane to achieve the obstacle clearance parameters	1	
A2.4	**Carry out after take-off procedures**		
(a)	perform after take-off checklist	1	
(b)	maintain the appropriate climb segment at the nominated heading and airspeed	1	
(c)	manoeuvre according to local and standard procedures	1	
(d)	maintain traffic separation	1	
A3.1	**Climb aeroplane**		
(a)	operate and monitor all aircraft systems when commencing, during, and completing a climbing flight manoeuvre	1	
(b)	adjust altimeter subscale according to applicable settings	1	
(c)	identify and avoid terrain and traffic	1	
(d)	for the following climbing manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) cruise climb	1	
	(ii) best angle climb	1	
	(iii) best rate climb	1	
(e)	anticipate level-off altitude and achieve straight and level flight	1	
A3.2	**Maintain straight and level flight**		
(a)	operate and monitor all aircraft systems during straight and level flight manoeuvres	1	
(b)	adjust altimeter subscale according to applicable settings	1	
(c)	identify and avoid terrain and traffic	1	
(d)	for the following straight and level manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) at slow speed	1	
	(ii) at normal cruise	1	
	(iii) at high-speed cruise	1	
	(iv) during acceleration and deceleration	1	
	(vii) with flaps selected	1	

LESSON PLAN AND TRAINING RECORD
CPL (A) 16: GENERAL HANDLING, BASIC INSTRUMENT FLIGHT & NAVAID TRAINING

FLIGHT TRAINING
Suggested flight time: 2.5 hours dual (1.3 IF)

MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved*
A3.4	**Turn aeroplane**		
(a)	operate and monitor all aircraft systems during turning flight manoeuvres	1	
(b)	for the following turning manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) level turns	1	
	(ii) climbing turns	1	
	(iii) powered descending turns	1	
	(iv) gliding descending turns	1	
(c)	complete turn manoeuvre on a nominated heading or geographical feature	1	
(d)	turn aeroplane at varying rates to achieve specified tracks	1	
(e)	manoeuvre aeroplane over specified tracks or geographical features	1	
A3.5	**Control aeroplane at slow speeds**		
(a)	complete pre-manoeuvre checks	1	
(b)	operate and monitor all aircraft systems when operating the aeroplane at slow speed	1	
(c)	for the following climbing manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) minimum approach speed with flaps retracted	1	
	(ii) minimum approach speed in approach configuration	1	
(d)	observe audible and visual stall warnings and recover aeroplane to controlled flight	1	
(e)	recognise and respond positively to reduced effectiveness of controls during slow flight manoeuvres	1	
(f)	transition from slow speed configuration using take-off power to achieve nominated speed in excess of 1.5 Vs without loss of height	1	
A5.1	**Enter and recover from stall**	1	
A5.2	**Recover from incipient spin**	1	
A5.3	**Turn aeroplane steeply**	1	
A5.4	**Sideslip aeroplane (where flight manual permits)**	1	
A6.6	**Recover from unusual flight attitudes**	1	
A6.4	**Conduct precautionary search and landing (simulated condition)**	1	
IFF.1	**Determine and monitor the serviceability of flight instruments and instrument power sources**		
(c)	monitor flight instrument and instrument power sources and react to any warnings, unserviceability or erroneous indications	1	
IFF.2	**Perform manoeuvres using full instrument panel**		
(a)	interpret flight instrument indications and apply procedures and techniques to achieve and maintain a specified flight path using the aircraft's full instrument panel	1	
(b)	set and maintain power and attitude by reference to the full instrument panel to achieve the following:		
	(i) straight and level performance during normal cruise within the flight tolerances	1	
	(ii) nominated climb performance within the flight tolerances	1	
	(iii) descent performance within the flight tolerances	1	
(c)	set and maintain power and attitude by reference to the full instrument panel to establish a rate 1 turn onto a nominated heading within the flight tolerances	1	

LESSON PLAN AND TRAINING RECORD
CPL (A) 16: GENERAL HANDLING, BASIC INSTRUMENT FLIGHT & NAVAID TRAINING

FLIGHT TRAINING
Suggested flight time: 2.5 hours dual (1.3 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Performance Standard Achieved*
IFF.3	**Recover from upset situations and unusual attitudes**		
(a)	correctly identify upset situations and unusual attitudes under simulated IMC	1	
(b)	recover to controlled flight from upset situations and unusual attitudes under simulated IMC from any combination of the following aircraft states:		
	(i) high and low-nose attitudes	1	
	(ii) varying angles of bank	1	
	(iii) various power settings	1	
	(iv) various aircraft configurations	1	
	(v) unbalanced flight	1	
IFL.1	**Recognise failure of attitude indicator and stabilised heading indicator**		
(a)	monitor flight instruments and instrument power sources and recognise warning indicators or erroneous instrument indications	1	
(b)	transition from a full instrument panel to a limited instrument panel	1	
IFL.2	**Perform manoeuvres – limited panel**		
(a)	interpret and respond appropriately to instrument indications	1	
(b)	apply power and attitude settings to achieve straight and level performance during:		
	(i) normal cruise	1	
	(ii) approach configuration with flaps (when fitted) and undercarriage down	1	
(c)	apply power and attitude settings to achieve:		
	(i) nominated climb performance	1	
	(ii) nominated descent performance	1	
	(iii) during climb, descent and straight and level flight, rate 1 turns onto a nominated heading	1	
(d)	trim (as applicable) and balance aircraft	1	
(e)	establish level flight at a nominated altitude, from a climb or descent during straight or turning flight	1	
IFL.3	**Recover from upset situations and unusual attitudes – limited panel**		
(a)	correctly identify upset situations and unusual attitudes under simulated IMC	1	
(b)	recover to stabilised straight and level flight using approved techniques from upset situations and unusual attitudes under simulated IMC from any combination of the following aircraft states:		
	(i) high and low-nose attitudes	1	
	(ii) varying angles of bank	1	
	(iii) various power settings	1	
	(iv) various aircraft configurations	1	
	(v) unbalanced flight	1	
IFL.4	**Re-establish visual flight**		
(a)	transition from visual flight conditions to instrument flight conditions while maintaining control of the aircraft	1	
(b)	perform a manoeuvre to re-establish visual flight	1	
(c)	implement a plan that ensures the flight continues in VMC	1	
RNE.1	**Operate and monitor radio navigation aids and systems**		
(a)	select and operate navigation aids and systems	1	
(b)	monitor and take appropriate action in relation to the integrity of navigation aid systems information	1	

LESSON PLAN AND TRAINING RECORD
CPL (A) 16: GENERAL HANDLING, BASIC INSTRUMENT FLIGHT & NAVAID TRAINING

FLIGHT TRAINING Suggested flight time: 2.5 hours dual (1.3 IF)			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
RNE.2	**Navigate the aircraft using navigation aids and systems**		
(a)	determine aircraft position fix solely with reference to navigation aids and systems	1	
(b)	intercept tracks to and from navigation aids and systems	1	
(c)	maintain tracks within specified tolerances	1	
(d)	record, assess and revise timings as required	1	
(e)	recognise station passage	1	
A3.7	**Local area airspace**	1	
A3.3	**Descend aeroplane**		
(a)	operate and monitor all aircraft systems during descending flight manoeuvres	1	
(b)	for the following descending manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:		
	(i) glide	1	
	(ii) powered	1	
	(iii) approach configuration descent (flap and undercarriage)	1	
(c)	anticipate level-off altitude and achieve straight and level flight	1	
A3.6	**Perform circuits and approaches**		
(a)	operate and monitor all aircraft systems when operating the aeroplane in the circuit	1	
(b)	in accordance with specific local procedures, safely perform a full circuit pattern (5 legs) by balancing and trimming the aeroplane accurately while applying smooth, coordinated control inputs to achieve the required flight tolerances specified for the flight path flown during traffic pattern manoeuvres as follows:		
	track upwind along extended centreline to 500 ft	1	
	(i) establish and maintain crosswind leg tracking 90° to the runway	1	
	(ii) establish and maintain downwind leg tracking parallel to, and at a specified distance from, the runway at circuit height	1	
	(iii) establish base leg tracking 90° to the runway at a specified distance from the runway threshold	1	
(c)	perform checks as required throughout circuit	1	
(d)	establish the approach and landing configuration appropriate for the runway and meteorological conditions, and adjust the power plant controls as required for the following:		
	(i) commence and control approach descent path	1	
	(ii) adjust descent commencement point to take account of extended downwind leg or traffic adjustments	1	
	(iii) align and maintain aircraft on final approach flight path with specified or appropriate runway	1	
	(iv) set and maintain approach configuration not below 500 ft AGL	1	
	(v) identify and maintain the nominated aiming point	1	
	(vi) maintain a stabilised approach angle at the nominated airspeed not less than 1.3Vs to the round-out height	1	
	(vii) verify existing wind conditions, make proper correction for drift, and maintain a precise ground track	1	
	(viii) apply speed allowances for wind gusts	1	
	(ix) configure aeroplane for landing	1	
(e)	maintain aircraft separation and position in the circuit with reference to other aircraft traffic in the circuit area	1	
A6.2	**Manage engine failure in the circuit area** (simulated)		
(a)	correctly identify an engine failure during flight	1	
(b)	apply the highest priority to taking action to control the aeroplane	1	

LESSON PLAN AND TRAINING RECORD
CPL (A) 16: GENERAL HANDLING, BASIC INSTRUMENT FLIGHT & NAVAID TRAINING

FLIGHT TRAINING Suggested flight time: 2.5 hours dual (1.3 IF)			
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
(c)	perform recall actions	1	
(d)	select a suitable landing area within gliding distance, on the aerodrome or elsewhere	1	
(e)	perform emergency procedures and land the aeroplane if the engine cannot be restarted as time permits	1	
(f)	advise ATS or other agencies capable of providing assistance of situation and intentions	1	
(g)	re-brief passengers about flight situation, brace position and harness security	1	
(h)	land the aeroplane ensuring safest outcome if an engine restart is not achieved	1	
A4.3	**Conduct a missed approach**		
(a)	recognise the conditions when a missed approach should be executed	1	
(b)	make the decision to execute a missed approach when it is safe to do so	1	
(c)	make a smooth, positively-controlled transition from approach to missed approach, including the following:		
	(i) select power, attitude and configuration to safely control aeroplane	1	
	(ii) manoeuvre aeroplane clear of the ground and conduct after take-off procedures	1	
	(iii) make allowance for wind velocity during go-around	1	
	(iv) avoid wake turbulence	1	
A4.4	**Perform recovery from missed landing**		
(a)	recognise when a missed landing is occurring and when it is appropriate to take recovery action	1	
(b)	make the decision to execute recovery from a missed landing only when it is safe to do so	1	
(c)	make a smooth, positively-controlled transition from a missed landing to missed approach, including the following:		
	(i) select power, attitude and configuration to safely control aeroplane	1	
	(ii) manoeuvre aeroplane clear of the ground and conduct after take-off procedures	1	
	(iii) make allowance for wind velocity during go-around	1	
	(iv) avoid wake turbulence	1	
A4.2	**Land aeroplane in a crosswind**		
(a)	verify existing wind conditions, make proper correction for drift, and maintain a precise ground track	1	
(b)	configure the aeroplane for the crosswind conditions	1	
(c)	control the aeroplane during the transition from final approach to touchdown and during after-landing roll to compensate for the crosswind conditions	1	
A4.5	**Short landing**		
(a)	land aeroplane at nominated touchdown point at minimum speed	1	
(b)	control ballooning during flare	1	
(c)	control bouncing after touchdown	1	
(d)	maintain direction after touchdown	1	
(e)	apply maximum braking without locking up wheels	1	
(f)	stops aircraft within landing distance available	1	
A4.1	**Land aeroplane**		
(a)	maintain a constant landing position aim point	1	
(b)	achieve a smooth, positively-controlled transition from final approach to touchdown, including the following:		
	(i) control ballooning during flare	1	
	(ii) touchdown at a controlled rate of descent, in the specified touchdown zone within tolerances	1	
	(iii) control bouncing after touchdown	1	

LESSON PLAN AND TRAINING RECORD
CPL (A) 16: GENERAL HANDLING, BASIC INSTRUMENT FLIGHT & NAVAID TRAINING

FLIGHT TRAINING Suggested flight time: 2.5 hours dual (1.3 IF)			
MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard Required	Achieved*
	(iv) touch down aligned with the centreline within tolerances	1	
(c)	ensure separation is maintained	1	
(d)	maintain positive directional control and crosswind correction during the after-landing roll	1	
(e)	use drag and braking devices, as applicable, in such a manner to bring the aeroplane to a safe stop	1	
(f)	complete the applicable after-landing checklist items in a timely manner	1	
NTS1.1	**Maintain effective lookout**	1	
NTS1.2	**Maintain situational awareness**		
(a)	monitor all aircraft systems using a systematic scan technique	1	
(b)	collect information to facilitate ongoing system management	1	
(c)	monitor flight environment for deviations from planned operations	1	
(d)	collect flight environment information to update planned operations	1	
NTS1.3	**Assess situations and make decisions**		
(a)	identify problems	1	
(b)	analyse problems	1	
(c)	identify solutions	1	
(d)	assess solutions and risks	1	
(e)	decide on a course of action	1	
(f)	communicate plans of action (if appropriate)	1	
(g)	allocate tasks for action (if appropriate)	1	
(h)	take actions to achieve optimum outcomes for the operation	1	
(i)	monitor progress against plan	1	
(j)	re-evaluate plan to achieve optimum outcomes	1	
NTS1.4	**Set priorities and manage tasks**		
(a)	organise workload and priorities to ensure optimum outcome of the flight	1	
(b)	plan events and tasks to occur sequentially	1	
(c)	anticipate events and tasks to ensure sufficient opportunity for completion	1	
(d)	use technology to reduce workload and improve cognitive and manipulative activities	1	
NTS1.5	**Maintain effective communications and interpersonal relationships**		
(a)	establish and maintain effective and efficient communications and interpersonal relationships with all stakeholders to ensure the optimum outcome of the flight	1	
(b)	define and explain objectives to stakeholders	1	
(c)	demonstrate a level of assertiveness that ensures the optimum completion of the flight	1	
NTS2.1	**Recognise and manage threats**		
(a)	identify relevant environmental or operational threats that are likely to affect the safety of the flight	1	
(b)	identify when competing priorities and demands may represent a threat to the safety of the flight	1	
(c)	develop and implement countermeasures to manage threats	1	
(d)	monitor and assess flight progress to ensure a safe outcome, or modify actions when a safe outcome is not assured	1	
NTS2.2	**Recognise and manage errors**		
(a)	apply checklists and standard operating procedures to prevent aircraft handling, procedural or communication errors	1	

LESSON PLAN AND TRAINING RECORD
CPL (A) 16: GENERAL HANDLING, BASIC INSTRUMENT FLIGHT & NAVAID TRAINING

FLIGHT TRAINING
Suggested flight time: 2.5 hours dual (1.3 IF)

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved*
(b)	identify committed errors before safety is affected or the aircraft enters an undesired state	1	
(c)	monitor the following to collect and analyse information to identify potential or actual errors:	1	
	(i) aircraft systems using a systematic scan technique	1	
	(ii) the flight environment	1	
	(iii) other crew	1	
(d)	implement countermeasures to prevent errors or take action in the time available to correct errors before the aircraft enters an undesired state	1	
NTS2.3	**Recognise and manage undesired aircraft state**		
(a)	recognise an undesired aircraft state	1	
(b)	prioritise tasks to ensure an undesired aircraft state is managed effectively	1	
(c)	apply corrective actions to recover an undesired aircraft state in a safe and timely manner	1	
A1.1	**Start and stop engine**		
(b)	perform engine shutdown and after shutdown actions	1	
(c)	manage engine shutdown malfunctions and emergencies	1	
(d)	considers ground surface in relation to contamination and propeller care during engine stop activities	1	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

CONSOLIDATION AND/OR REMEDIAL TRAINING

MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard: Required	Performance Standard: Achieved

LESSON PLAN AND TRAINING RECORD
CPL (A) 16: GENERAL HANDLING, BASIC INSTRUMENT FLIGHT & NAVAID TRAINING

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for next lesson • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to next training session?	**Yes**	**No**

Instructor's signature & date	Trainee's signature & date

	Commercial Pilot Licence – Aeroplane Category Rating

LESSON PLAN AND TRAINING RECORD
CPL (A) 17: PRE-LICENCE

Flight no:	CPL (A) 17.____	**Trainee name & ARN:**			
Date:		**Instructor:**			
Aircraft registration:		**Aircraft type:**		**Flight time:**	

Lesson Overview
- Pre--licence final assessment
- Navigation Exercise 11 – Navigation route: YRED – YBCG – YNAN - GALLANGOWAN - YRED
- Simulated commercial exercise, including simulated passenger and cargo management and loading
- Assess remaining performance criteria in preparation for CPLA flight test. Flight manoeuvres to be performed within the flight tolerances for the professional level, mentioned in table 2, Schedule 8 of the Part 61 MOS

**lesson plan scenario – OCTA– CTA – OCTA (circuits) -OCTA*

PRE-FLIGHT KNOWLEDGE
Long Briefing: as required Pre-flight Briefing: as required
Underpinning knowledge: as required

Content

Long briefing
- Preparation for and overview of exercise
- Flight test preparation and expectations

Underpinning knowledge
- Review and assess flight test knowledge requirements

HF & NTS
- Revise as required in preparation for flight test

Pre-flight briefing
- Review flight sequences, what to expect, see & do
- Check essential knowledge
- Reinforce threat & error management
- Reinforce significant airmanship points

Pre-flight knowledge components complete:	**Instructor's signature & date**

Performance Standard		
3	**2**	**1**
Has received training in the element, however is not able to consistently demonstrate competency to the standard required for qualification issue	Demonstrates a developing level of proficiency, and is deemed safe to conduct solo practice under direct supervision	Achieves competency to the standard required for qualification issue

LESSON PLAN AND TRAINING RECORD
CPL (A) 17: PRE-LICENCE

FLIGHT TRAINING Suggested flight time: 2.8 hours dual (0.3 IF)			
MOS Reference	Lesson Content *(Elements & Performance Criteria)*	Performance Standard	
		Required	Achieved*
ONTA.1	**Non-towered aerodrome – pre-flight preparation**	1	
CTR.1	**Controlled aerodrome pre-flight preparation**	1	
NAV.1	**Prepare documents and flight plan**	1	
C2.1	**Pre-flight actions and procedures** *Weight and balance, take-off and landing performance, fuel requirements*	1	
C4.1	**Plan fuel requirements**	1	
C4.2	**Manage fuel system**	1	
C5.1	**Manage passengers**	1	
C5.2	**Aid and assist passengers**	1	
C5.3	**Manage cargo**	1	
A1.1	**Start and stop engine**	1	
ONTA.2	**Taxi aircraft at a non-towered aerodrome or landing area**	1	
A2.1	**Carry out pre take-off procedures**	1	
A2.2	**Take off aeroplane**	1	
A6.1	**Manage engine failure - take-off (simulated)**	1	
A2.3	**Take off aeroplane in a crosswind**	1	
A2.5	**Take off aeroplane from 'short field'**	1	
A2.4	**Carry out after take-off procedures**	1	
A3.1	**Climb aeroplane**	1	
NAV.3	**Conduct departure procedures**	1	
ONTA.3	**Perform departure at a non-towered aerodrome or landing area**	1	
A3.2	**Maintain straight and level flight**	1	
NAV.2	**Comply with airspace procedures while navigating**	1	
NAV.4	**Navigate aircraft enroute**	1	
OGA	**Operate aircraft in Class G airspace**	1	
NAV.5	**Navigate at low level and in reduced visibility**	1	
NAV.6	**Perform lost procedure**	1	
NAV.7	**Perform diversion procedure**	1	
NAV.8	**Use instrument navigation systems**	1	
RNE.1	**Operate and monitor radio navigation aids and systems**	1	
RNE.2	**Navigate the aircraft using navigation aids and systems**	1	
A3.4	**Turn aeroplane**	1	
A3.5	**Control aeroplane at slow speeds**	1	
A6.3	**Perform forced landing (simulated)**	1	
A6.5	**Manage other abnormal situations (simulated)** *(e.g. undercarriage retraction or extension failure, engine fire in flight, electrical failure)*	1	
IFF.1	**Determine and monitor the serviceability of flight instruments and instrument power sources**	1	
IFF.2	**Perform manoeuvres using full instrument panel**	1	

LESSON PLAN AND TRAINING RECORD
CPL (A) 17: PRE-LICENCE

FLIGHT TRAINING Suggested flight time: 2.8 hours dual (0.3 IF)		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	Required	Achieved*
IFF.3	Recover from upset situations and unusual attitudes	1	
IFL.1	Recognise failure of attitude indicator and stabilised heading indicator	1	
IFL.2	Perform manoeuvres – limited panel	1	
IFL.3	Recover from upset situations and unusual attitudes – limited panel	1	
IFL.4	Re-establish visual flight	1	
CTA.1	Operate aircraft in controlled airspace	1	
A3.3	Descend aeroplane	1	
CTR.4	Perform arrival and landing at controlled aerodrome	1	
CTR.2	Taxi aircraft at a controlled aerodrome	1	
CTR.3	Perform departure from controlled aerodrome	1	
A3.6	Perform circuits and approaches	1	
A6.2	Manage engine failure in the circuit area (simulated)	1	
A4.3	Conduct a missed approach	1	
A4.4	Perform recovery from missed landing	1	
A4.2	Land aeroplane in a crosswind	1	
A4.5	Short landing	1	
ONTA.4	Perform arrival and landing at a non-towered aerodrome or landing area	1	
NAV.9	Execute arrival procedures	1	
A4.1	Land aeroplane	1	
NTS1.2	Maintain situational awareness	1	
NTS1.3	Assess situations and make decisions	1	
NTS1.4	Set priorities and manage tasks	1	
NTS1.5	Maintain effective communications and interpersonal relationships	1	
NTS2.1	Recognise and manage threats	1	
NTS2.2	Recognise and manage errors	1	
NTS2.3	Recognise and manage undesired aircraft state	1	

Enter the performance standard achieved if it is different to that required
Where it has not been possible to introduce performance criteria or the trainee has not achieved the required standard, the performance criteria must be covered during the next lesson. Enter these performance criteria in the lesson record for the subsequent lesson.

LESSON PLAN AND TRAINING RECORD
CPL (A) 17: PRE-LICENCE

CONSOLIDATION AND/OR REMEDIAL TRAINING		Performance Standard	
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Required**	**Achieved**

DEBRIEFING
Content
• Training review and outcomes achieved against lesson objectives and the Part 61 MOS competency standards • Recommendations for next lesson (including any carryover/remedial training) • Trainee preparation for flight test • Training record completion and sign off

COMMENTS AND OUTCOME		
Proceed to CPLA flight test? #	**Yes**	**No**

#Each of the performance criteria contained within the units of competency for the Commercial Pilot Licence –Aeroplane Category Rating must have been assessed to performance standard 1, on a minimum of two separate flights.

Instructor's signature & date	Trainee's signature & date

ACCELERATED COMPETENCY

Flight no:		**Trainee name & ARN:**	
Date:		**Instructor:**	

FLIGHT TRAINING		
MOS Reference	**Lesson Content** *(Elements & Performance Criteria)*	**Performance Standard Achieved**

COMMENTS

Instructor's signature & date	Trainee's signature & date

This form is to be used to record the assessments which are made ahead of the syllabus schedule (i.e. not included in the lesson plan and training record form).

Enter the assessed performance criteria and the standard achieved. Attach the form to the lesson plan and training record form for the lesson in which the early assessment was made.

Underpinning Knowledge Items Tracker

CPL(A)	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q
C1	1	1															
C2	1	1	1	1	1	1											
C3	1	1	1			4											
C4	1	1	1	4	4	4	4	4									
C5	4	4	4	4	4												
NAV	6	6	3	11	4	3											
A1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
A2	1	1	1	1	1	1											
A3	1	1	2	1	1	1	1	2	1	2	1	1	1	1	1	1	1
A4	1	1	1	1	1	1	1	1	1	1	1						
A5	1	1	1	1	1	1	1										
A6	1	1	2	1	1	2	1	1	1	1	2	1	1	1	1		
IFF	2	2	2														
IFL	2	2	2	2	2												
NTS1	1	1															
NTS2	1	1	1	1	1	1		1	1								
RNE	6	6	6	6													
ONTA	3	3	3	4	3												
OGA	3																
CTR	4	4	4	4	4												
CTA	4	4	4	4	4												

Instructions : Enter lesson number where underpinning knowledge item first appears.