Flight Instructor Course Handbook

Volume 2: Single-Engine CRI Course

A Study Guide by Steve Pells **Optimised for iPad** Version 3.3 19May24

Flight Instructor Course Handbook

The following volumes are available:

Volume 1: FI Course
Volume 2: Single Engine CRI Course
Volume 3: Multi Engine CRI Course
Volume 4: Instrument Instructor & IRI Course
Volume 5: Night Instructor Course
Volume 6: FIC Preparation Course
Volume 7: MCCI Course
Volume 8: Aerobatics Instructor Course
Volume 9: CPL Instructor Guidance

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Abbreviations

(A)	Aeroplane	**IFR**	Instrument flight rules	**SE**	Single-engine or Senior Examiner
ACA	Asymmetric committal altitude	**IMCR**	UK IMC Rating	**SEP**	Single-engine piston
ACH	Asymmetric committal height	**IMC**	Instrument meteorological conditions	**SFI**	Synthetic flight instructor
AFM	Aeroplane flight manual	**IR**	Instrument rating	**STI**	Synthetic training instructor
AoC	Assessment of competence	**IRE**	Instrument rating examiner	**SPA**	Single pilot aeroplane
ATO	Approved training organisation	**IRI**	Instrument rating instructor	**SPIC**	Student pilot in command
CCC	Course completion certificate	**IRR**	IR renewal & revalidation examiner	**SSEA**	Simple single-engine aeroplane
CFI	Chief flying instructor	**IR(R)**	Instrument rating (Restricted)	**SSR**	Standard stall recovery
CPL	Commercial pilot's licence	**LAPL**	Light aircraft pilot's licence	**TEM**	Threat & error management
CRE	Class rating examiner	**MCCI**	Multi crew co-operation instructor	**TK**	Theoretical knowledge
CRI	Class rating instructor	**ME**	Multi-engine	**TMG**	Touring motor glider
CRM	Crew resource management	**MEP**	Multi-engine piston	**TOC**	Top of climb
CSU	Constant speed unit	**MI**	Mountain rating instructor	**TOD**	Top of descent
DTO	Designated training organisation	**MP**	Multi-pilot or Manifold pressure	**TRI**	Type rating instructor
EASA	European Union Aviation Safety Agency	**MPL**	Multi pilot licence	**Ts & Ps**	Temperatures and pressures
EFATO	Engine failure after take-off	**Nm**	Nautical mile	**V_{AT}**	Threshold speed
FCL	Flight crew licencing	**NPPL**	UK national private pilot's licence	**VFR**	Visual flight rules
FE	Flight examiner	**OEI**	One engine inoperative	**VMC**	Visual meteorological conditions
FFS	Full flight simulator	**P1**	Pilot in command	**Vmc**	Minimum control speed
FI	Flight instructor	**P1/s**	Pilot in command under supervision	**Vmca**	Minimum control speed in the air
FI (R)	Restricted Flight instructor	**PIC**	Pilot in command	**VP**	Variable pitch
FIC	Flight instructor course	**PICUS**	Pilot in command under supervision	**Vr**	Rotate Speed
FICI	Flight instructor course instructor	**PoH**	Pilot's operating handbook	**V_{REF}**	Final approach reference speed
FIE	Flight instructor examiner	**PPL**	Private pilot's licence	**VS**	Vertical speed
FNPT	Flight navigation procedures trainer	**PuT**	Pilot under training	**V_{S1}**	Stall speed in a specific configuration
FT	Follow through	**QXC**	Qualifying cross country (defunct)	**V_{S0}**	Stall speed in landing configuration
FTI	Flight test instructor	**ROC**	Rate of climb	**Vtoss**	Take of safety speed
G/A	Go-around	**ROD**	Rate of descent	**Vx**	Best angle of climb speed
(H)	Helicopter	**RTO**	Rejected take-off	**Vxse**	Best angle of climb speed single engine
HDG	Heading	**RW R/W**	Runway	**Vy**	Best rate of climb speed
HoT	Head of Training	**S&L**	Straight and level	**Vyse**	Best rate of climb speed single engine

Introduction

This document is designed to assist the trainee Instructor through his/her journey from qualified and proficient pilot, to a Class Rating Instructor (SE).

It contains lots of background imformation and suggested briefs and Air Exercises. It is by no means the only way of achieving the qualification.

In this document, for ease of writing, the generic student is referred to as ‘he’. This is not meant to imply that women cannot be taught to fly! It is just a recognition that by far the majority of flying students are male. In this document, the word ‘he’ should be taken to mean any student pilot (or instructor or examiner) of any gender, or no gender, or gender-fluid.

Overview

The path from pilot to instructor is a journey. Long, and at times arduous, but worth the effort. Usually, before embarking on a journey, it is customary to know a bit about the destination.

In our case, the destination is a CRI instructor certificate for single-engined aeroplanes CRI (A). Before getting there it is worth knowing a bit about what it is we are aiming for.

What follows is a discussion about the various types of instructor certificate and the courses to which they relate.

Since the UK left EASA on 31 December 2020, things have changed. Initially much remains the same other than terminology. However, over time, it is expected that the information in this guide will become out of date. It is hoped to keep it revised as much as possible.

Part 1: Instructor Certificates

Instructor Certificates

The Class Rating Instructor (CRI) Certificate

Instructor Certificates

There are several diferent types of instructor certificate available. Subject to sucessful completion of an assessment of competence with a suitably qualified examiner, the CAA will issue an appropriate Flight Instructor Certificate. The various types are listed below:

CRI: **Class Rating Instructor** – Allows the holder to train pilots who already hold a licence, but does not permit ab-initio flight training. Some of the different instructional privileges can be added to the CRI certificate except Instrument privileges (for which he can obtain a standalone IRI) or FIC privileges (the ability to teach flight instructor courses). The CRI cannot train towards the issue of a night rating.

The following will not be covered in this document.

FI: **Flight Instructor** - Required for ab-initio training to LAPL or PPL standard and beyond.

It Allows the holder to conduct training towards the issue of a class rating, aerobatics rating, refresher training, checkouts and differences/familiarisation training. It also allows the holder to train a LAPL holder for upgrade to a PPL.

IRI: **Instrument rating Instructor** – Allows the holder to instruct towards the issue of an EIR, IR or IR(R) in single engined aeroplanes unless the holder also has privileges to instruct for MEP. An IRI cannot instuct ab-initio students unless he also holds an FI certificate.

MCCI: **Multi Crew Co-Operation Instructor** – Allows the instructor to teach for multi crew operation in airliners, simulators etc

SFI: **Synthetic Flight Instructor:** Allows the holder to instruct in flight simulators for Single and Multi-Pilot aeroplanes.

STI: **Synthetic Training Instructor** - Allows the holder to instruct in flight simulators for the issue of a licence and for Single-Pilot aeroplanes.

TRI: **Type Rating Instructor** - Allows the holder to instruct towards the issue of a type rating for those aircraft which require one.

MI: **Mountain Rating Instructor** - Allows the holder to instruct towards the issue of a Mountain Rating

FTI: **Flight Test Instructor**

The Class Rating Instructor CRI (A) Certificate

Once qualified, the instructor will be a CRI with privileges to instruct for the class or classes shown in section XII of the licence. Unlike an FI, the CRI is NOT initially restricted to instructing under the supervision of another instructor.

XII	Ratings, certificates and privileges
Class/Type/IR	**Remarks and Restrictions**
IR(Restricted)	Restricted to the privileges of the Instrument Meteorological Conditions Rating specified in the United Kingdom Air Navigation Order
MEP (land)	SP
Night	No Remark
SEP (land)	No Remark
	No Further Entries
Instructors	**Remarks and Restrictions**
CRI	For/SEP (land)/SP/FCL.945
	No Further Entries
Examiners No Entries	

FCL.945 Privileges

All new CRI (SE) holders will have FCL.945 privileges recorded on their licence as shown below. Those intructors who do not have this on their licences can apply to the CAA to have it added, or next time the licence is re-issued by the CAA, it will be automatically added. 945 privileges allow an instructor to sign a pilot's SEP class rating in a Part FCL licence only, for a further 2 years, after they have conducted the refresher training flight with that instructor. Previously, this was required to be signed by an examiner. Pilots with National (non-Part FCL) licences will need to find a Ground Examiner (GR) to perform a similar procedure.

FCL.740.A Revalidation of class and type ratings - aeroplanes.

(b) Revalidation of single-pilot single-engine class ratings:
(1) Single-engine piston aeroplane class ratings and TMG ratings. For revalidation of single-pilot single-engine piston aeroplane class ratings or TMG class ratings the applicant shall:

- (i) within the 3 months preceding the expiry date of the rating, pass a proficiency check in the relevant class in accordance with Appendix 9 to this Part with an examiner; (note this proficiency test can be taken at ANY time, but doing so within the final 3 months of validity retains the original expiry date)

  OR

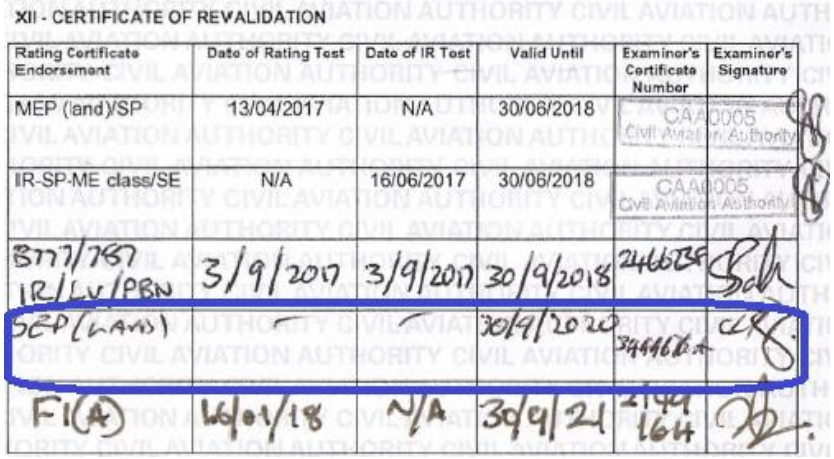
- (ii) within the 12 months preceding the expiry date of the rating complete 12 hours of flight time in the relevant class, including:
  - 6 hours as PIC,
  - 12 take-offs & 12 landings, and
  - **Refresher Training** of at least 1 hour of total flight time with a UK flight instructor (FI) or class rating instructor (CRI). Applicants shall be exempted from this refresher training if they have passed a class or type rating proficiency check, skill test or assessment of competence in any other class or type of aeroplane (excluding the IMC Rating test).

Upon completion of the training flight for the revalidation of an SEP or TMG class rating in accordance with FCL.740.A(b)(1) and only in the event of fulfilment of all the other revalidation criteria required by FCL.740.A(b)(1) the instructor shall endorse the applicant's licence with the new expiry

date of the rating or certificate, if specifically authorised for that purpose by the competent authority responsible for the applicant's licence (ie if the instructor has FCL.945 on his licence). This is the **ONLY** time an instructor, rather than an examiner, may sign a pilot's licence.

So, the 945 qualified instructor must carry out a training refresher flight with the pilot within the last year of validity of the rating. It must last at least one hour and has no required content. Following completion, the instructor signs the rating for a further 2 years from the date of expiry of the original rating. **NOTE**, even if the pilot's performance leaves much to be desired, the instructor must still sign the logbook for the training given.

Note that as soon as the pilot has carried out all the required hours, take-offs & landings, and the refresher flight, then the licence may be signed giving the SEP rating a further 2 years beyond the original expiry. For example, referring to the above timeline, if a pilot carried out all the required flying by 03 June 2020, then his licence could be revalidated until 31 May 2023, almost 3 years hence.



XII - CERTIFICATE OF REVALIDATION

Rating Certificate Endorsement	Date of Rating Test	Date of IR Test	Valid Until	Examiner's Certificate Number	Examiner's Signature
MEP (land)/SP	13/04/2017	N/A	30/06/2018	CAA 0005 Civil Aviation Authority	
IR-SP-ME class/SE	N/A	16/06/2017	30/06/2018	CAA 0005 Civil Aviation Authority	
B777/787 IR/LV/PBN	3/9/2017	3/9/2017	30/9/2018	246635	
SEP(LAND)			30/9/2020	344466	
FI(A)	16/01/18	N/A	30/9/21	21991644	

What defines the Refresher Training Flight?

A flight during which a person is receiving flight instruction from a properly authorised instructor e.g., FI, CRI, etc.
Examples of training flights include:

- Flight on a training course e.g., Night Rating, IR, IMC Rating, Class Rating, etc
- Formation flying training.
- Revision of stalling (or other exercise)
- Aerobatic flying training
- Differences training

Note, also that in order to revalidate a pilot's rating and sign the licence, then the refresher training flight must have been conducted or completed by that same instructor. If the training flight was conducted entirely by a different instructor, then an examiner must check the experience and sign the licence.

In addition, the instructor and pilot complete sections 1 & 3 of **SRG 1107** or pages 1 and 2 of **SRG 1157** and send a copy to the CAA by mail or to **licenceapplications@caa.co.uk**. **SRG 1107** is shown below, and seems the better form:

Course Completion Certificate for issue, revalidation, renewal or variation of a Single or Multi-Pilot Type/Class Rating or the renewal of an Instrument Rating

This form is intended for use in the provision of evidence in support of an application made to the CAA using the CAA's online application service. Once completed the form should be scanned or photographed and uploaded by the applicant as part of an online application to the CAA.

FALSE REPRESENTATION STATEMENT

It is an offence under the UK Air Navigation Order to make, with intent to deceive, any false representation for the purpose of procuring the grant, issue, revalidation, renewal or variation of any certificate, licence, approval, permission or other document. This offence is punishable on summary conviction by a fine and on conviction on indictment with an unlimited fine or imprisonment or both.

1 COURSE/TRAINING COMPLETION CERTIFICATE — **To be completed by the Training Organisation**

If a separate course completion certificate has not been provided

I certify that (name)..... CAA Personal reference number (if known): | | | | | | | |

Date of Birth..... has satisfactorily completed a course of training in accordance with Part-FCL for the following:

Type/Class Rating ☐ **and/or** Instrument Rating ☐

Date Training commenced:		Date Training completed:	
Aircraft Type/Class name (including variants)			

3 NOTIFICATION OF REVALIDATION (if applicable) — **To be completed by the Applicant**

I am notifying the CAA of the Revalidation by Experience of: SEP (land) ☐ SEP (sea) ☐ TMG ☐

I declare that the information provided on this form is correct and I have fully reviewed all guidance notes.

Applicants name: ..... Signature: ..... Date:.....

3.1 NOTIFICATION OF REVALIDATION – CONFIRMATION OF FLIGHT EXPERIENCE — **To be completed by the UK FCL.945 Instructor/UK Examiner**

I certify that I have examined the applicant's logbook(s) and the entries in them meet in full the requirements to revalidation by experience.

Total Flight Time in preceding 12 months: ..... Hours. Total Flight Time as PIC in preceding 12 months.....Hours.

Date(s) of Training Flight with Instructor: .....

I have endorsed the rating on the Certificate of Revalidation and the new expiry date is:.....

Competent Authority issuing UK FCL.945 Instructor/UK Examiner's Certificate: .....

UK FCL.945 Instructor/UK Examiner's Name: .....

UK FCL.945 Instructor/UK Examiner's Number: .....

UK FCL.945 Instructor/UK Examiner's Signature: ..... Date:.....

PLEASE REFER TO FALSE REPRESENTATION STATEMENT ON PAGE 1

Alternatively, pages 1 and 2 of **SRG 1157** can be completed:

EXAMINERS REPORT - For Single Pilot Aeroplanes (SPA) Skill Test for Issue of Class and Type Ratings and Proficiency Checks for Revalidation and Renewal of Class, Type and Instrument Ratings, Revalidation by Experience of Class Ratings, excluding SP High Performance Complex Aeroplanes and Sea Class Ratings in accordance with Part-FCL. (European Commission Regulation (EU)No 1178/2011 as amended).

Civil Aviation Authority

Complete clearly in BLOCK CAPITALS using black or dark blue ink.

FALSE REPRESENTATION STATEMENT
It is an offence under the UK Air Navigation Order to make, with intent to deceive, any false representation for the purpose of procuringthe grant, issue, renewal or variation of any certificate, licence, approval, permission or other document. This offence is punishable on summary conviction by a fine, and on conviction on indictment with an unlimited fine or imprisonment or both.

1. APPLICANTS DETAILS — **To be completed by the Applicant**

CAA Personal Reference Number: 1 2 3 4 5 6 A

Forename(s): Peter Surname: Piper Date of Birth : 21/09/1999

Initial Issue ☐ Revalidation by Proficiency Check ☐ Revalidation by Experience ☑ or Renewal ☐

Type Rating ☐ including variants ..... including type specific IR ☐

Class Rating ☑ SEP (land)

Expiry of previous or current type/class rating: 31/05/2022

Stand-alone Instrument Rating (IR/SPA): SE ☐ ME ☐ Revalidation ☐ Renewal ☐

Expiry of previous or current IR/SPA: .....

I confirm that I have requested the above Skill Test or Proficiency Check or Revalidation by Experience.

Applicant's signature: ..... Date: 20/03/2022

2. EXAMINERS REPORT OF TEST OR CHECK — **To be completed by the Examiner**

Date of Skill Test or Proficiency Check: ..... Location: .....

Start time (Chocks): ..... Finish time(Chocks): ..... Total duration: ..... (HH:MM)

Aircraft Type/Class including variants used: ..... Aircraft Registration: .....

Identification Number of FSTD used:..... (to be in accordance with Commission Regulation (EU) 1178/2011 as retained (and amended in UK domestic law) under the European Union (Withdrawal) Act 2018

Competent Authority issuing qualification certificate for FSTD: .....

Result of Skill Test or Proficiency Check: Pass ☐ Partial Pass ☐ Fail ☐ (if fail or partial pass also complete SRG 2129)

Revalidation by Experience of aeroplane class or classes: SEP (land) .....

I confirm that the applicant has met the requirements of Part-FCL.740.A for Revalidation by experience:

Expiry of new Type/Class Rating: 31/05/2024 I have ☑ I have not ☐ endorsed the Certificate of Revalidation in the applicant's licence.(If not signed also complete SRG 1119).

Stand-alone Instrument Rating (IR/SPA): Pass ☐ Partial Pass ☐ Fail ☐ (if fail or partial pass also complete SRG 2129)

Expiry of new IR/SPA: ..... SE ☐ ME ☐

I have ☐ I have not* ☐ endorsed the Certificate of Revalidation in the applicant's licence (*If not signed also complete SRG 1119).

If cross-crediting is claimed for revalidation of the IR/SPA, state the other type/class rating for which an LPC including IR was completed and the expiry date of that rating: ..... Type or Class Rating: ..... Expiry of Rating: .....

3. PBN — **To be completed by the Examiner**

I confirm that the applicant has been tested in PBN elements as relevant (Commission Regulation EU 1178/2011 as amended – Annex I, Appendix 7 and 9 Refers) ☐

I confirm that this skill test/proficiency check did not include an RNP APCH and that the applicant has been advised that:

- the PBN privileges of their IR does not include an RNP APCH, and that
- this restriction can be lifted upon completing a proficiency check which includes an RNP APCH. ☐

4. CONFIRMATION — **To be completed by the Examiner**

I have found that the applicant's instruction and experience comply with Part FCL and confirm that all the required manoeuvres and exercises have been completed and that the applicant's theoretical knowledge has been confirmed by verbal examination (where applicable) in accordance with Appendix 9 to Part-FCL.

Examiner's Name: A PieLot Examiner's Number: 9 8 7 6 5 4 V

Authorising Competent Authority: UK CAA

Examiner's Signature: ..... Date: 20/03/2022

Non-UK Examiners - I have reviewed and applied the relevant national procedures and requirements of the UK CAA.

UK CAA Examiner Designation Reference: .....

Declaration of applicant - I declare that the information provided on this form is correct and I have been informed of the result of the Skill Test or Proficiency Check or Revalidation of the Class Rating(s) by Experience.

Applicants signature: ..... Date: 20/03/2022

Copies of the report shall be submitted to (1) The Applicant, (2) The Applicant's Competent Authority, (3) The Examiner, (4) The Examiner's Competent Authority (if different), (5). The Examiner should also complete Form SRG2199 as required, (6)

English Language Proficiency assessments should be completed using Form SRG1199.

*If the licence has not been endorsed by the examiner, the pilot will need to submit online application form **SRG 3108** and upload: a copy of examiner report form **SRG 1157** or form **SRG 1107**, a certified copy of their logbook, and a certified copy of their licence. There is a fee of £93 for this application.*

Note that validation by experience and FCL 945 privileges are only for single engine (non-complex) aircraft types. MEP aircraft and those with type ratings (eg 747) can only be revalidated by a proficiency check with an examiner.

Those instructors who do not have 945 privileges on their licences can apply to the CAA to have it added, or next time the licence is re-issued by the CAA, it will be automatically added.

FIs restricted to teaching for the LAPL only (ie those that have not passed the CPL theoretical knowledge exams), will not get the 945 privilege because a LAPL uses recency to maintain validity. Such instructors could apply for a CRI certificate at the same time as applying for the FI, and this will give 945 privileges.

Validity of the CRI Certificate

An FI(A) certificate is valid for 36 months plus the remainder of the month of test.

Revalidation & Renewal of the CRI Certificate

Remember, revalidation is the process of extension of privileges **BEFORE** expiry has occurred. If it occurs after the rating or certificate has already expired, it is known as renewal. If a rating or certificate expires, it remains on the licence until the next time re-issued by the CAA (say to add a new rating), at which time it transfers to the reverse of the licence.

Revalidation of the CRI Certificate

Within the 3 year validity period of the certificate, 2 out of the following 3 must be completed:

- Complete 10 hours flight instruction during the validity of the certificate. Hours flown as an examiner on flight tests counts as instructional hours for this purpose.
- Complete **Instructor Refresher Training** any time within the 3 year validity. Note this is different to an FI seminar. CRI Refresher training is training as determined by an ATO authorised to train for the CRI course. It could be flying and/or ground work at the discretion of the Head of Training. See note below.
- Complete an assessment of competence with an FIE any time in the validity period of the certificate. In this case, following a successful outcome, and all other requirements having been completed, the FIE will sign the licence for another 3 years.
- **Note:** An assessment of competence with an FIE is required at least every other revalidation.
- The order in which the Instructor Refresher Training and the AoC are carried out does not matter, but the 2 must be completed within the validity of the CRI certificate.

Renewal of the CRI Certificate

If expired, both of the following must be completed to renew:

- Complete **Instructor Refresher Training** any time within the 3 year validity. Note this is different to an FI seminar. CRI Refresher training is training as determined by an ATO authorised to train for the CRI course. It could be flying and/or ground work at the discretion of the Head of Training. See note below.
- Complete an assessment of competence with an FIE. If the CRI certificate is on the front of the licence, following a successful outcome, and all other requirements having been completed, the FIE will sign the licence for another 3 years. If the certificate is on the reverse of the licence, then the licence must be re-issued from the CAA which will attract a fee.
- The order in which the Refresher Training and AoC are carried out does not matter, but the 2 must be completed within 12 months of each other.

Then the on-line form **SRG 2159** should be completed unless the instructor is enrolled in e-licensing in which case the details should be updated there.

From the Aircrew Regulations concerning CRI Refresher Training:

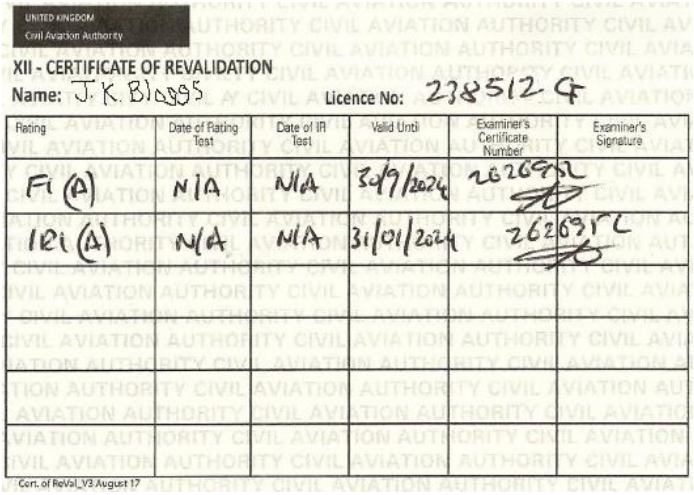
- *(a) Paragraph (c)(1) of FCL.940.CRI determine that an applicant for renewal of a CRI certificate shall complete refresher training as a CRI at an ATO or competent authority. Paragraph (a)(2) also establishes that an applicant for revalidation of the CRI certificate that has not completed a minimum amount of instruction hours (established in paragraph (a)(1)) during the validity period of the certificate shall undertake refresher training at an ATO or competent authority for the revalidation of the certificate.*
  - *The amount of refresher training needed should be determined on a case by case basis by the ATO or competent authority, taking into account the following factors:*
  - *(1) the experience of the applicant;*
  - *(2) whether the training is for revalidation or renewal;*
  - *(3) the amount of time elapsed since the last time the applicant has conducted training, in the case of revalidation, or since the certificate has lapsed, in the case of renewal. The amount of training needed to reach the desired level of competence should increase with the time elapsed.*
- *(b) Once the ATO or competent authority has determined the needs of the applicant, it should develop an individual training programme that should be based on the CRI training course and focus on the aspects where the applicant has shown the greatest needs.*
- *(c) After successful completion of the refresher training, as applicable, the ATO or competent authority, should, in accordance with point (b), issue the applicant with a training completion certificate or another document specified by the competent authority, which describes the evaluation of the factors listed in point (a)(1) (the experience of the applicant) and the training received, as well as a statement that the training was successfully completed. The training completion certificate should be presented to the examiner prior to the assessment of competence.*
- *Upon successful completion of the refresher training, as applicable, the ATO should submit the training completion certificate, or the other document specified by the competent authority, to the competent authority.*

Note: This page does not form part of the licence

Ratings previously held by holder
Licence Number **GBR.FCL.AT.238384G.A**
Last and first name of holder: BLOGGS, Jay Kay
Class/Type/IR
AVRORJ/BAe146
B777/787
B737 300-900
B737 100-200
A320
MEP (land)
Instructors
FI

The reverse of a licence showing previously held ratings.

After completion of these items, on-line form **SRG 2159** should be completed.



UNITED KINGDOM
Civil Aviation Authority

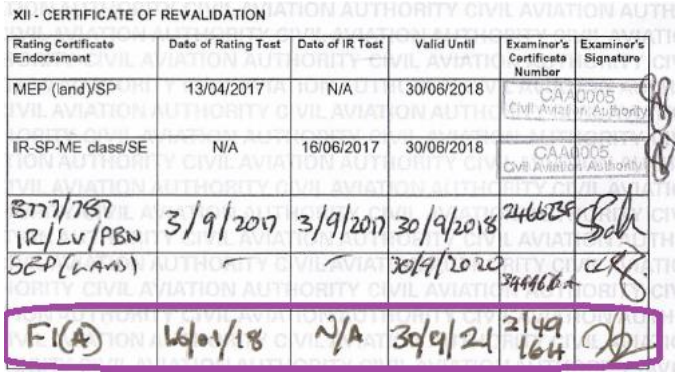
XII - CERTIFICATE OF REVALIDATION

Name: J. K. Bloggs Licence No: 238512 G

Rating	Date of Rating Test	Date of IR Test	Valid Until	Examiner's Certificate Number	Examiner's Signature
FI (A)	N/A	N/A	30/9/2024	2626952	
IRI (A)	N/A	N/A	31/01/2024	2626952	

Cert. of ReVal_V3 August 17

If the pages in the licence become full, revalidations and renewals may be signed on an extra page as shown above. Make sure the examiner writes the name and licence number of the holder.



XII - CERTIFICATE OF REVALIDATION

Rating Certificate Endorsement	Date of Rating Test	Date of IR Test	Valid Until	Examiner's Certificate Number	Examiner's Signature
MEP (land)/SP	13/04/2017	N/A	30/06/2018	CAA005 Civil Aviation Authority	
IR-SP-ME class/SE	N/A	16/06/2017	30/06/2018	CAA005 Civil Aviation Authority	
B777/787 IR/LV/PBN	3/9/2017	3/9/2017	30/9/2018	2466[illegible]	
SEP(LAND)			30/9/2020	[illegible]	
FI(A)	16/01/18	N/A	30/9/21	2149 164	

The revalidation of an FI(A) certificate in a licence. CRI is similar

→

Credit for Certificates Already Held

An instructor who holds any certificate, eg, FI, IRI, TRI etc (SP or MP) and wishes to add another certificate, is exempted the requirement of the 25 hours Teaching & Learning module in the ground school. For example if an FI(R) wishes to teach for MEP, then he must do the CRI(ME) course but need not do the 25 hrs groundschool element. Just 5 hours flight training & 10 hours groundschool. Likewise a TRI who wants an IRI. In general, an FI gives 5 hours flying credit and 25 hours groundschool credit. Adding IR instrument privileges to an FI requires 200 hrs IFR flight time, but a standalone IRI needs 800.

Part 2: Instructor Courses

The SE Class Rating Instructor CRI (A) Course
A Typical CRI Course

The SE Class Rating Instructor CRI (A) Course

Pre-Entry Requirements

There are pre-entry requirements for a CRI(A) course. For a CRI for single-engined aeroplanes, the applicant must:

- Hold at least the licence and rating for which instruction will be given, ie SEP (land) or (sea)
- Be entitled to act as PIC of the aircraft.
- Have flown at least 300 hours on aeroplanes (not microlights). For example, a C42 is a 3 axis microlight and may be flown on a PPL, but time accrued does not count towards the 300 hours.
- Have flown at least 30 hours as PIC in the class of aircraft concerned (ie SEP land).
- A CPL is NOT required for a CRI (SE).
- NO pre-entry assessment is required for a CRI SE course.

SE CRI COURSE PRE-ENTRY CHECKLIST		
Hold Relevant current SE class rating?	Expiry:	
Hold current Medical Certificate?	Expiry:	
300 hours Total Time on aeroplanes?	TT(A):	
30 hours PIC on Relevant SE class?	SE(A):	

Course Details

Flight Training: The CRI(A) course consists of a minimum of 3 hours dual flight training with a suitably qualified instructor (FICI). All training must be carried out at an ATO (Approved Training Organisation). Such training is likely to be based on the single engine proficiency check and to focus on forced landings, emergencies, circuits and stalling. It is therefore important that the trainee is thoroughly familiar with the proficiency check schedule.

Ground Training: There is a requirement for ground instruction which will comprise at least 35 hours of which 25 hours shall be teaching and learning and 10 hours technical training including revision of theoretical knowledge and the development of classroom teaching skills.

Assessment: After the course, the ATO shall complete an **Instructor Course Completion Certificate** CAA 5018. An assessment of competence by an FIE (Flight Instructor Examiner) will take place at the end, and a successful outcome will allow the applicant to apply for the CRI(A) certificate.

Privileges:

A CRI may instruct for:

(a) the issue, revalidation or renewal of a class or type rating for **non-complex non-high performance single-pilot** aeroplanes, when the privileges sought by the applicant are to fly in single-pilot operations.

(b) a Banner Towing, Glider Towing or Aerobatic Rating for the aeroplane category, provided the CRI holds the relevant rating and has demonstrated the ability to instruct for that rating to an FIC instructor (FICI).

The CRI SE holder may not instruct ab-initio pilots. He may instruct qualified pilots with other ratings, or with an expired SE rating towards the issue of an SE rating. Typically he can teach airline pilots who hold CPL or ATPL with airline type ratings, but no SE rating attached. He can also teach licence holders the aerobatic rating and towing provided he has 15 hours PIC time on those ratings. The CRI may also instruct for the extension of LAPL(A) privileges to another class or variant of aeroplane. A CRI cannot teach for the night rating (but he can teach **at** night). A CRI cannot teach for the IR or IMC Rating/IR(R) unless he also holds a standalone IRI.

The privileges of a CRI are restricted to the class or type of aeroplane in which the instructor assessment of competence was taken. The privileges of the CRI shall be extended to further classes or types when the CRI has completed, within the last 12 months:
(1) 15 hours flight time as PIC on aeroplanes of the applicable class or type of aeroplane;
(2) one training flight from the right-hand seat under the supervision of another CRI or FI qualified for that class or type occupying the other pilot's seat.
This applies to similar types such as PC-12 variants and the like and does not apply between the likes of SEP & MEP

From Part-FCL:

GENERAL

(a) The aim of the CRI training course is to train aircraft licence holders to the level of competence defined in FCL.920 and adequate to a CRI.
(b) The training course should be designed to give adequate training to the applicant in theoretical knowledge instruction, flight instruction and FSTD instruction to instruct for any class or type rating, except for single-pilot high-performance complex aeroplanes, for which the applicant is qualified.
(c) The flight training should be aimed at ensuring that the applicant is able to teach the air exercises safely and efficiently to students undergoing a course of training for the issue of a class or type rating, except for single-pilot high-performance complex aeroplanes.
(d) It is to be noted that Threat & Error Management (TEM) is a vital ingredient of all flight operations. Therefore, in the following air exercises the relevant aspects of TEM are to be stressed at the appropriate times during each flight.
(e) The student instructor should learn how to identify common errors and how to correct them properly, which should be emphasised at all times.

CONTENT

(f) The training course consists of three parts:

(1) Part 1: **Teaching and Learning** that should be in accordance with AMC1 FCL.920 & 930;
(2) Part 2: Technical **Theoretical Knowledge** instruction (technical training);
(3) Part 3: **Flight Instruction**.

A Typical CRI (SE) Course

Course Objective

The objective of the course is to train pilots with more than 300 hours as pilot of an aeroplane and with at least 30 hours as PIC on the applicable class of aeroplane, to the level of proficiency necessary for the issue of a CRI(A) rating for single engine aeroplanes.

A succesful candidate must have good knowledge of the course entry requirements, the training syllabus (ground and air), the skill test format and the rating privileges.

Privileges and conditions

On successful completion of the CRI Course and Assessment of Competence (AoC), an applicant will be issued with the rating for an CRI (SE).
In accordance with **FCL.905 CRI** The privileges of a CRI are to instruct for:

(1) the issue, revalidation or renewal of a class or type rating for single-pilot aeroplanes (except for single-pilot high performance complex aeroplanes) when the privileges sought by the applicant are to fly in single-pilot operations.

(2) the extension of LAPL(A) privileges to another class or variant of aeroplane.

(3) the dual training flight required under Part-FCL 740 for class rating revalidation by experience.

The privileges of a CRI are restricted to the class or type of aeroplane in which the instructor assessment of competence was taken. The CRI will also have FCL 945 privileges, meaning that he will, under certain circumstances, be authorised to revalidate a student's class rating and sign the licence.

Course Description

The course is to consist of a minimum of: -

(a) 3 hours dual flying instruction.
(b) Teaching & Learning 25 hrs (applicants holding or having held an Instructors Certificate shall be fully credited towards this requirement).
(c) Technical Training 10 hrs including revision of TK, the preparation of lesson plans and the development of class room instructional skills.

It should be noted that CPL knowledge is not a pre-entry requirement for this course, and additional theoretical knowledge training may be needed, depending upon the experience level of the candidate. The purpose of this course is **NOT** to teach TK.

Pre –Entry Requirements

Before being permitted to begin an approved course of training for a CRI (SPA) rating, an applicant shall have:

a. 300 hours as pilot of an aeroplane.

b. Completed 30 hours as PIC on an applicable type or class of aeroplane

All to be completed prior to commencing the course.

Medical Requirements

An applicant for a FCL CRI(A) shall hold a valid Medical Certificate appropriate to the licence held and privileges being exercised. (Full details Part MED).

Training Programme

The co-ordination of the ground and flight training is a necessary and important part of any pilot course. Care must be exercised to ensure that flying training periods are compatible with the student instructor's level of ground training.

The following sections detail the theoretical knowledge training and the flight training.

Theoretical Knowledge Training

The ground training consists of all instruction given for the purpose of the course by an appointed competent person and includes classroom lectures, tutorials, long briefings and directed private study. The subjects covered during the course will include Teaching and Learning and relevant theoretical knowledge subjects from the PPL syllabus:

Definitions

Long briefing: A detailed explanation and discussion conducted by a qualified flight instructor and covering the major considerations of an air exercise. The normal length should be approximately 40-50 minutes and it may be given either as a tutorial to an individual student or as an informal lecture to two or more students.

Pre-flight briefing: The briefing normally includes a statement of the aim and brief allusion to principles of flight only if relevant. An explanation is to be given of the air exercises which are to be taught by the instructor and practised by the student during the flight. It should include how the flight will be conducted with regard to who is to fly the aeroplane and with what TEM, airmanship, weather and flight safety aspects which currently apply. The nature of the lesson will govern the order in which the constituent parts are to be taught.

The four basic components of the briefing will be:

1. The aim
2. Threat & Error Management (TEM)
3. Principles of flight (briefest reference only)
4. The air exercise(s) what, and why and how and by whom

Post-flight discussion:

A few minutes devoted by instructor immediately after a specific flight lesson to consolidate the major points made during the flight clarifying any queries the student instructor might have and indicating progress made by the student, using fault analysis or praise as necessary and finally to indicate the nature of the next lesson.

Theoretical Subjects:

The essential knowledge needed by students to comprehend the constraints of their intended operating environment and its inter-relationship with the operation of an aeroplane within their personal limitations. The subject material is normally covered by formal classroom lectures in conjunction with directed study.
It is intended that the student instructor when practising the giving of lectures and long briefings should use the technical subject material.

Flight Training and Flight Instruction

Introduction

Instructors will be taught how to construct flight lesson plans so as to make the best use of each flight lesson.

Note: There is no requirement for spinning in a CRI course.

Planning of flight lesson

The preparation of lesson plans is an essential pre-requisite of good instruction and the student instructor will be given supervised practice in the planning and practical application of flight lesson plans.

General Considerations

The student instructor will complete flight training to practise the principles of flight instruction.
During this training the student instructor shall occupy the seat normally occupied by the FI(A), ie the right hand seat. Many pilots will never have flown an aircraft from the right hand seat, so the first flight exercise will give him the opportunity to practice take-offs, landings and other exercises from that seat.
Threat & Error management (TEM) is a vital ingredient of all flight operations. Therefore, in the following air exercises the relevant aspects of airmanship will be stressed at the appropriate time during each flight.

An FI(A) teaching a student for the PPL(A) would follow the full syllabus of PPL lessons. During the CRI course a few of these elements are used to teach the CRI student the necessary instructional techniques required. With priority given to take-off and landing, and the safety training exercises; but with additional items designed to cover the needs of the Class Rating Instructor.

Course Completion

After the course, the ATO shall complete an Instructor Course Completion Certificate **CAA 5018**.
Upon completion of the course, the candidate shall demonstrate to an FIE, a level of competence in instructional techniques appropriate to the privileges of a CRI (SPA/SE).

Who is the CRI likely to be Teaching?

Upon sucessful completion of the course, the CRI is likely to be instructing a pilot who falls into one of the following categories:

- A qualified and current SEP pilot (LAPL, PPL or above) who wants to carry out differences or familiarisation training (eg VP prop or retractable landing gear).
- A qualified and current SEP pilot (LAPL, PPL or above) who needs a club checkout prior to hiring.
- A qualified and current SEP pilot (LAPL, PPL or above) who wants to carry out the 1 hour instructional flight for rating revalidation by experience.
- A qualified pilot whose SEP (land) rating has recently expired. He requires training before taking a proficiency check and the preparation of a course completion certificate: **SRG 1107**.
- A qualified and current airline pilot whose SEP (land) rating is long expired (or even was never held). He requires training before taking a skill test or proficiency check. He will need a course completion certificate **SRG 1107**.
- A qualified and current SEP pilot who wishes to fly with an instructor for further training, recency or confidence reasons.

Where is the CRI likely to be Teaching?

Upon sucessful completion of the course, the CRI could be teaching either within an ATO or DTO, or outside. Certain instruction MUST be carried out at an ATO or DTO, such as:

- LAPL to PPL upgrade.
- Refresher training for SEP rating expired by more than 3 years.
- Training for initial issue of a class rating.

Other instruction may be conducted outside an ATO or DTO, such as:

- Differences & Familarisation training
- Refresher training for SEP rating expired by less than 3 years.
- The 1 hour instructional flight for revalidation.
- Recency, coaching & confidence building.

This kind of training can be conducted outside of a formal training environment on a mutually acceptable agreement between instructor and student. The instructor must create his own course completion certificate if needed.

Section 1: Ground Non-Technical Training

Non aircraft-technical subjects to be studied are:

A: TEACHING & LEARNING (Unless Exempt)

1. Characteristics of Instructors

Instructor Attitude	Instructor Appearance	Qualities of a good instructor	Qualities of a poor instructor

2. Characteristics of Students

Students as Individuals	Types of Students	Emotional Differences	Rates of Learning

3. The Learning Process

Motivation Perception and Understanding	Memory and its application Habits and Transfer	Obstacles to Learning Incentives to Learning	Learning Methods Rates of Learning

4. The Teaching Process

Elements of effective teaching Planning of instructional activity	Teaching Methods Teaching from the 'Known to the unknown'	Use of Lesson plans

5. Training Philosophies

Value of a structured course of training	Importance of a planned syllabus	Integration of TK and flight instruction

6. Techniques of Applied Instruction

(a) Theoretical Knowledge - Classroom instruction techniques:	**(b) Flight - Airborne instruction techniques**
Use of training aids – models, whiteboard, instruments Group lectures Individual briefings Student participation/discussion	The flight/cockpit environment Techniques of applied airborne instruction In-flight TEM, judgement & decision making Post-flight TEM, judgement & decision making

7. Student Evaluating & Testing

a) Assessment of student performance:	**(b) Analysis of student errors:**
The function of progress tests Recall of knowledge	Establish the reason for errors Tackle major faults first, minor faults second

Translation of knowledge into understanding Development of understanding into actions The need to evaluate rate of progress	Avoidance of over criticism The need for clear concise communication Rating & grading

8. Training Programme Development

Lesson planning Preparation	Explanation and demonstration Student participation and practice	Evaluation

9. Human Performance and Limitations Relevant to Flight Instruction

Physiological factors Human information processing	Behavioural attitudes Development of judgement and decision making	TEM

10. Hazards Involved in Simulating Systems Failures & Malfunctions During Flight

Selection of a safe altitude Importance of 'touch drills'	Situational awareness Adherence to correct procedures

B: 1. TRAINING ADMINISTRATION

Flight/TK instruction records Pilot Logbooks Flight & ground curriculum	Study material Official forms **SRG 1107**, **1157**, **3108** Flight authorisation papers	Aircraft/Owner's Manuals/PoH Aircraft documents The PPL requirements

C:1. RESPONSIBILITIES OF THE CRI

Personal standards Standardisation of training Authorisation and supervision of student flying Preparation for skill tests/proficiency checks	Training effectiveness - examination & fault analysis Development of student responsibilities The need for continuity training Revalidation/renewal of rating

D: REGULATORY REQUIREMENTS

1. AMC FCL.930 CRI - General Requirements

Basic authority to act as a flight crew member Acceptance of licences, ratings authorisations, approvals or certificates Validity of licences and ratings Medical fitness	Decrease in medical fitness Crediting of flight time State of licence issue Pilot Logbooks

2. FCL Subpart C - Private Pilot Licence

Medical fitness	Ratings for special purposes	Privileges and conditions

3. FCL Subpart H -Type and Class ratings

Division of class ratings. Differences/Familarisation training in SEP a/c Circumstances in which type or class ratings are required	Validity, revalidation and renewal Class Rating Skill Test & Proficiency Check Content

4. FCL Subpart J - Instructor Certificates

Instructor Certificates — General CRI (SEP) Requirements	Period of validity Class Rating Instructor CRI (SE) Privileges	CRI (SEP) Revalidation & renewal

Requirements of the SEP (land) Proficiency Check

Although not an examiner, the CRI should familiarise himself for the test schedule for the SEP (land) Skill test/proficiency check, since much of his work will involve training pilots towards this end. Details can be found in the Examiner's Handbook

Notes on SEP (land) Skill Tests & Proficiency Checks

- **SRG 1157** has some items which are marked with an M, meaning mandatory. However, all items should be assessed.
- **SRG 2199** and **SRG1157** are both advertised as being suitable, however **SRG 1157** is better for GA aircraft.
- On-line form **SRG 3108** is used after a successful skill test to apply for the rating.
- If the rating has expired and is now on the reverse of the licence, on-line form **SRG 3108** and a licence fee will be required.
- The navigation part of the Skill Test/Proficiency Check need only be a short transit (10 mins) to the airwork area and can be accomplished using whatever means.
- Only one of the 3 stalls needs to be assessed, however the examiner may choose to assess more, or even all 3.
- Section 3A (VFR navigation) must always be completed unless section 3B (Instrument flight) is done.
- The RTO is an integral part of the SEP (land) Class Rating, so must be carried out as part of the ST/PC.
- Touch and go landings are not necessarily part of the SEP (land) course. Discuss with the applicant whether or not they are comfortable doing them. If not, then taxy back for another take-off each time. If they are, discuss who will move various levers on the runway as this applicant's training may be different to others.
- The requirement not to have done more than 25% of the required training for an applicant does NOT apply to the renewal or revalidation of a class rating.
- **Section 3A - En-Route (VFR)**. The exact content and duration of section 3A is at the discretion of the examiner and depends on the recent experience of the applicant and the performance and complexity of the aircraft used for test. As a minimum it should comprise one route sector or navigation leg, sufficient for the applicant to demonstrate proficiency in en-route VFR procedures. For example, the applicant might be briefed to take the aircraft to a defined destination, away from the point of departure, where it is suitable to conduct the airwork exercises. For less experienced applicants, perhaps those who fly infrequently or those who have not flown VFR in the UK for some time, it might be appropriate to plan and manage a slightly longer, more involved en-route section. Note however, that this is not intended to replicate the en-

route section of an initial PPL or CPL skill test, thus a flight time in the cruise of approximately 15-30 minutes (not more than 45) is envisaged for this section.

Applicant's details							
Name: ..... CAA Ref No: ..... A/C Type/Reg: ..... FLT Time: ..... Date:							
Manoeuvres/Procedures M (Mandatory)			Pass /Fail	**Manoeuvres/Procedures** M (Mandatory)			Pass /Fail
Section 1 Departure				**Section 3B Instrument flight**			
1.1	Pre-flight including: Documentation Mass and Balance Weather briefing NOTAM			3B.1*	Departure IFR	M	
				3B.2*	En-route IFR	M	
				3B.3*	Holding procedures	M	
1.2	Pre-start checks			3B.4*	3D operations to DH/A of 200 feet (60m) or to higher minima if required by the approach procedure (autopilot may be used to the final approach segment vertical path)	M	
1.2.1	External						
1.2.2	Internal	M		3B.5*	2D operations to MDH/A and MAP	M	
1.3	Engine starting: Normal Malfunctions	M		3B.6*	Flight exercises including simulated failure of the compass and attitude indicator: Rate 1 turns, Recoveries from unusual attitudes	M	
1.4	Taxiing	M					
1.5	Pre-departure checks: Engine run-up (if applicable)	M		3B.7*	Failure of localiser or glideslope		
				3B.8*	ATC liaison - Compliance, R/T procedure		
1.6	Take-off procedure: Normal with Flight Manual flap settings Crosswind (if conditions available)			**Section 4 Arrival and landings**			
				4.1	Aerodrome arrival procedure	M	
1.7	Climbing: Vx/Vy Turns onto headings Level off	M		4.2	Normal landing	M	
				4.3	Flapless landing	M	
				4.4	Crosswind landing (if suitable conditions)		
1.8	ATC liaison - Compliance R/T procedure			4.5	Approach and landing with idle power from up to 2000' above the runway (single engine aeroplane only)		
Section 2 Airwork (VMC)							
2.1	Straight and level flight at various airspeeds including flight at critically low airspeed with and without flaps (including approach to VMCA when applicable)			4.6	Go-around from minimum height	M	
				4.7	Night go-around and landing (if applicable)		
2.2	Steep turns (360° left and right at 45° bank)	M		4.8	ATC liaison - Compliance, R/T procedure		
2.3	(i) Clean stall (ii) Approach to stall in descending turn with bank with approach configuration and power (iii) Approach to stall in landing configuration and power (iv) Approach to stall, climbing turn with take-off flap and climb power (single engine aeroplane only)	M		**Section 5 Abnormal and emergency procedures (This section may be combined with sections 1 through 4)**			
				5.1	Rejected take-off at a reasonable speed	M	
				5.2	Simulated engine failure after take-off (single engine aeroplanes only)	M	
				5.3	Simulated forced landing without power (single engine aeroplanes only)	M	
2.4	Handling using autopilot and flight director (may be conducted in section 3) if applicable	M		5.4	Simulated emergencies: (i) Fire or smoke in flight; (ii) Systems malfunctions as appropriate		
2.5	ATC Liaison - Compliance, R/T procedure						
Section 3A En-route procedures VFR				5.5	Engine shutdown and restart (ME Skill Test only) (at a safe altitude if performed in the aircraft)		
3A.1	Flight plan, dead reckoning and map reading						
3A.2	Maintenance of altitude, heading and speed			5.6	ATC liaison - Compliance, R/T procedure		
3A.3	Orientation, timing and revision of ETAs			**Section 6 Simulated asymmetric flight**			
3A.4	Use of radio navigation aids (if applicable)			6.1*	Simulated engine failure during take-off	M	
3A.5	Flight management (flight log, routine checks including fuel, systems and icing)				(at a safe altitude unless carried out in FFS or FNPT II) (This section may be combined with sections 1 through 5)		
3A.6	ATC liaison - Compliance, R/T procedure			6.2*	Asymmetric approach and go-around	M	
* Shall be flown solely by reference to instruments. If this condition is not met during the Skill Test or Proficiency Check, the type rating will be restricted to VFR only.				6.3*	Asymmetric approach and full stop landing	M	
				6.4	ATC liaison - Compliance, R/T procedure		

Section 2: Theoretical Knowledge (TK)

The following serve as a reminder of the theoretical knowledge expected of the trainee instructor:

LIMITATIONS & EMERGENCY PROCEDURES: See AFM/PoH for type.
MASS AND BALANCE Knowledge of limitations and calculation methods, forward/aft limitations of C of G, normal and utility operation, mass & centre of gravity calculations, aeroplane manual mass and balance sheet. Use of AFM/PoH.
PERFORMANCE **Take-off:** TORA & TODA, Study of AFM/PoH charts. Take-off & initial climb, effects of mass, wind & density altitude, effects of ground surface & gradient, use of flaps. The WAT Limitations, Accelerate/Stop Distance Considerations. Part-OPS (Subpart H), AICs. **In flight:** Study of AFM/PoH charts. Relationship between power reqd & pwr available, performance diagram, maximum rate & maximum angle of climb, range & endurance, effects of configuration, weight, temp & altitude, reduction of performance during climbing turns, gliding, icing, rain. En-Route Ceiling, En-Route Range/Endurance. **Landing:** Study of AFM/PoH charts. Effects of mass, wind, density alt & app speed, use of flaps, ground surface and gradient, go around.
AIRCRAFT SYSTEMS **Airframe:** Load Factors, Landing Gear & Flap: Limiting Speeds, Manoeuvring Speeds, Rough Air Speed (Va/Vno), Maximum Speeds. **Fuel System:** Fuel tanks and supply lines, venting system, mechanical and electrical pumps, gravity feed, tank selection, system management. **Engines:** RPM & Manifold Pressure, Temperatures and Pressures. **Propellers:** Propeller nomenclature, conversion of engine power to thrust, design & construction of fixed pitch propeller, forces acting on propeller blade, variation of RPM with change of airspeed, thrust efficiency with change of speed, design and construction of variable pitch propeller, constant speed unit operation, effect of blade pitch changes, windmilling effect. **Landing Gear & Brakes:** Normal operation of landing gear & brakes, Non-Normal operation of landing gear & brakes. **Other Systems:** Oil System, Oil Grade & Specification, Ignition System, Mixture Control System, Cabin Heating & Ventilation Systems, Pitot/Static System: Pressure Instruments, Vacuum System: Gyroscopic Instruments & Limitations, Electrical System including Gyroscopic Instruments as applicable, Flying Controls - Including Flaps, Control Locks, Hydraulic System, De-icing system, Pressurisation & Oxygen System (as applicable), Auto Pilot System, Turbo Charging System, Other Systems Particular to Type.
GENERAL FLIGHT SAFETY **Aeroplane:** Seat & rudder pedal adjustment and security, harness and seat belts, refuelling precautions flammable goods/pressurised containers, emergency equipment and its use, fire extinguisher: engine/cabin fires, de-icing systems, survival equipment: life jackets, life rafts, carbon monoxide poisoning & detection. **Operational:** Wake turbulence, aquaplaning, windshear. Passenger & crew briefings: emergency exits, evacuation from the aeroplane, forced landings, gear-up landing, ditching.

AIR LEGISLATION

Pre flight action by commander of aircraft, The Air Navigation (general) Regulations, Air OPS, Part CAT, Part NCO. AICs.

Note: Although some mass & performance calculations are applicable to Public Transport flights only, pilots should be aware of the requirements in order that they may elect to operate at the greater level of safety provided by the observance of these regulations. Eg 1.25 & 1.33/1.43.

Section – 3: Flight Training & Flight Instruction

Introduction

Selected air exercises from the PPL(A) syllabus are used with a priority given to take-off and landing, and the safety training exercises; but with additional items designed to cover the needs of the flight instructor. Also, fundamentally important is the need to ensure full aircraft familiarisation with a new type of aircraft.
Instructors will be taught how to construct flight lesson plans so as to make the best use of each flight lesson.

Planning of flight lesson

The preparation of lesson plans is an essential pre-requisite of good instruction and the student instructor will be given supervised practice in the planning and practical application of flight lesson plans.

General Considerations

The student instructor will complete flight training to practise the principles of basic instruction at PPL(A) level.
During this training the student instructor shall occupy the seat normally occupied by the FI(A).
TEM is a vital ingredient of all flight operations. Therefore, in the following air exercises the relevant aspects of TEM will be stressed at the appropriate time during each flight.

Long Briefings and Air Exercises

CRI SE EXERCISE 1: The Partial Pass
CRI SE EXERCISE 2: The Club Checkout
CRI SE EXERCISE 3: Circuits
CRI SE EXERCISE 4: Emergency Procedures
CRI SE EXERCISE 5: The Experienced Airline Pilot
CRI SE EXERCISE 6: The 1 Hour Training flight with an instructor

It is appreciated that it may not be possible to cover all of this material in the time available for flight training.

INSTRUCTIONAL METHODS

Pre and Post-Flight Briefings.

In order to extract the maximum benefit from the training flights FIC instructors are to brief their CRI students fully on the requirements of the flight before flying. After landing students are then to be debriefed on their performance and, be given constructive criticism on any failings observed.

(a) The technical theoretical-knowledge instruction should comprise at least 10 hours of training to include the revision of technical knowledge, preparation of lesson plans, integration of TEM, and development of classroom instructional skills to enable the CRI to teach the technical theoretical-knowledge syllabus.

(b) The type or class rating theoretical syllabus should be used to develop the CRI teaching skills in relation to the type or class technical course syllabus. The course instructor should deliver example lectures from the applicable type or class technical syllabus. The candidate instructor should prepare and deliver lectures on topics that are selected by the course instructor from the type/class rating course and the generic topics listed further below:

Retractable Landing Gear	Thunderstorms	How to file a VFR flight plan
Variable Pitch/Constant Speed Propeller	Weather Fronts	Using TEM to avoid Infringement
Aircraft Fuel system (specific a/c type)	Cross-Channel Flight Procedures	Use of GPS in General Aviation
Aircraft Electrical System (specific a/c type)	Blackbushe Airport Operational Procedures	VOR Navigation
Aircraft Performance (specific a/c type)	Radiotelephony at UK airports	Mass & Balance
Pitot Static Instruments		Aircraft Take-off & landing performance

(c) The 10 hours of technical theoretical-knowledge instruction should develop the applicant's ability to teach a student the knowledge and understanding that are required for the relevant air exercises for either SE or ME aeroplanes, depending on the privileges sought by the candidate.
(d) If CRI privileges for both SE and ME aeroplanes are sought, the applicant should complete 10 hours of technical theoretical-knowledge instruction related to SE and ME aeroplanes each.

Air Exercises

The flight training syllabus for CRI SE training courses should comprise Air Exercises 1 to 4 and should not last less than 3 hours. The following 4 exercises are suggested and include ground briefing and air exercises.

CRI SE EXERCISE 1: **The 'Partial Pass'.** RHS Famil & Airwork
CRI SE EXERCISE 2: **The 'Club Checkout'.** A club checkout flight designed by the Trainee CRI.
CRI SE EXERCISE 3: **The 'Circuit Detail'.** Normal landings, variant landings and go-arounds.
CRI SE EXERCISE 4: **'Emergencies'.** A chance to practice the various emergency drills.
CRI SE EXERCISE 5: **The 'Mock Proficiency Check'.** Full Mock SEP Prof Check including Emergency Procedures & circuits.
CRI SE EXERCISE 6: **The 'Experienced Airline Pilot'.** Requires 'reminder' training since there are a few things he has forgotten!

CRI SE Exercise 1: 'The 'Partial Pass'. RHS Famil & Airwork

This flight has 2 functions – firstly to familiarise the trainee instructor with operation of a familiar aircraft from an unfamiliar seat. Secondly, to practice teaching and critiquing the airwork part of the SEP (land) rating proficiency check. It also reviews typical examiner paperwork that a student might present with.

Scenario:

The student has come to you following a partial pass of an SEP (land) proficiency check with an examiner. He has paperwork including an **SRG 1157** showing a failed Section 2 (Airwork) and an **SRG 2129** (Reasons for Failure). The examiner has mandated additional training. After discussion with the student, you are to come up with a plan for this training. You must carry out a short pre-flight brief, and then fly the exercise. After the flight you will conduct a short debrief .

See PPL Lessons Ex10, 11, 15.

CRI SE Ex1: 'The 'Partial Pass' - Long Briefing Topics:

(1) Review & explanation of paperwork from SEP Prof Check Partial Pass.
(2) Development of a plan of training.
(3) Pre-Flight (Short) briefing to student of forthcoming lesson.
(4) Operating from the RHS.
- (i) Mindset,
- (ii) Use of different hands for power & control,
- (iii) Reaching controls & switches,
- (iv) Parallax.

(5) TEM during Stalling & Spinning. HASELL Checks.
(6) Theory of Stalling & Spinning. Symptoms, Recovery technique. SSR
(7) The 3 (or 4) different stalling scenarios.
(8) Fully Stalled Condition & Approach to the stall. Recognition.
(9) Secondary Stalls.
(10) Spinning (if required/desired) - Recovery at incipient & developed stages.
(11) Theory of Steep/Advanced turning.

The following pages contain the paperwork given to 2 different students by the examiner, after a partial pass of a proficiency check.

Example 1

EXAMINERS REPORT - For Single Pilot Aeroplanes (SPA) Skill Test for issue of Class and Type Ratings and Proficiency Checks for Revalidation and Renewal of Class, Type and Instrument Ratings, Revalidation by Experience of Class Ratings, excluding SP High Performance Complex Aeroplanes and Sea Class Ratings in accordance with Part-FCL. (European Commission Regulation (EU)No 1178/2011 as amended).

Civil Aviation Authority

Complete clearly in BLOCK CAPITALS using black or dark blue ink.

FALSE REPRESENTATION STATEMENT
It is an offence under the UK Air Navigation Order to make, with intent to deceive, any false representation for the purpose of procuringthe grant, issue, renewal or variation of any certificate, licence, approval, permission or other document. This offence is punishable on summary conviction by a fine, and on conviction on indictment with an unlimited fine or imprisonment or both.

1. APPLICANTS DETAILS — **To be completed by the Applicant**

CAA Personal Reference Number: 2 3 2 5 1 4 G

Forename(s): STEPHEN (JIMMY) Surname: BELLS Date of Birth: 14/05/66

Initial Issue ☐ Revalidation by Proficiency Check ☐ Revalidation by Experience ☐ or Renewal ☑

Type Rating ☐ including variants..... including type specific IR ☐

Class Rating ☑ : SEP (land)

Expiry of previous or current type/class rating: 30/09/20

Stand-alone Instrument Rating (IR/SPA): SE ☐ ME ☐ Revalidation ☐ Renewal ☐

Expiry of previous or current IR/SPA: .....

I confirm that I have requested the above Skill Test or Proficiency Check or Revalidation by Experience.

Applicant's signature: ..... Date: 4/4/21

2. EXAMINERS REPORT OF TEST OR CHECK — **To be completed by the Examiner**

Date of Skill Test or Proficiency Check: 4/4/21 Location: EGLK

Start time (Chocks): 0900 Finish time(Chocks): 1000 Total duration: 1:00 (HH:MM)

Aircraft Type/Class including variants used: SEP (land) PA28 Aircraft Registration: G-BEXW

Identification Number of FSTD used:..... (to be in accordance with Commission Regulation (EU) 1178/2011 as retained (and amended in UK domestic law) under the European Union (Withdrawal) Act 2018

Competent Authority issuing qualification certificate for FSTD: .....

Result of Skill Test or Proficiency Check: Pass ☐ Partial Pass ☑ Fail ☐ (if fail or partial pass also complete SRG 2129)

Revalidation by Experience of aeroplane class or classes: .....

I confirm that the applicant has met the requirements of Part-FCL.740.A for Revalidation by experience:

Expiry of new Type/Class Rating: ..... I have ☐ I have not ☑ endorsed the Certificate of Revalidation in the applicant's licence.(If not signed also complete SRG 1119).

Stand-alone Instrument Rating (IR/SPA): Pass ☐ Partial Pass ☐ Fail ☐ (if fail or partial pass also complete SRG 2129)

Expiry of new IR/SPA: ..... SE ☐ ME ☐

I have ☐ I have not* ☐ endorsed the Certificate of Revalidation in the applicant's licence (*If not signed also complete SRG 1119).

If cross-crediting is claimed for revalidation of the IR/SPA, state the other type/class rating for which an LPC including IR was completed and the expiry date of that rating: ..... Type or Class Rating: ..... Expiry of Rating: .....

3. PBN — **To be completed by the Examiner**

I confirm that the applicant has been tested in PBN elements as relevant (Commission Regulation EU 1178/2011 as amended – Annex I, Appendix 7 and 9 Refers) ☐

I confirm that this skill test/proficiency check did not include an RNP APCH and that the applicant has been advised that:

- the PBN privileges of their IR does not include an RNP APCH, and that
- this restriction can be lifted upon completing a proficiency check which includes an RNP APCH. ☐

4. CONFIRMATION — **To be completed by the Examiner**

I have found that the applicant's instruction and experience comply with Part FCL and confirm that all the required manoeuvres and exercises have been completed and that the applicant's theoretical knowledge has been confirmed by verbal examination (where applicable) in accordance with Appendix 9 to Part-FCL.

Examiner's Name: B. I. G. Chopper Examiner's Number: 1 2 3 4 5 6 A

Authorising Competent Authority: UK CAA

Examiner's Signature: ..... Date: 4/4/21

Non-UK Examiners *- I have reviewed and applied the relevant national procedures and requirements of the UK CAA.*

UK CAA Examiner Designation Reference: .....

Declaration of applicant - I declare that the information provided on this form is correct and I have been informed of the result of the Skill Test or Proficiency Check or Revalidation of the Class Rating(s) by Experience.

Applicants signature: ..... Date: 4/4/21

Copies of the report shall be submitted to (1) The Applicant, (2) The Applicant's Competent Authority, (3) The Examiner, (4) The Examiner's Competent Authority (if different), (5). The Examiner should also complete Form SRG2199 as required, (6)

English Language Proficiency assessments should be completed using Form SRG1199.

Applicant's details

Name: S.J. Pells CAA Ref No: 2335146 A/C Type/Reg: G-BEXW FLT Time: 1:00 Date: 4/4/21

Manoeuvres/Procedures M (Mandatory)			Pass /Fail	Manoeuvres/Procedures M (Mandatory)			Pass /Fail
Section 1 Departure				**Section 3B Instrument flight**			
1.1	Pre-flight including: Documentation Mass and Balance Weather briefing NOTAM		✓	3B.1*	Departure IFR	M	
				3B.2*	En-route IFR	M	
				3B.3*	Holding procedures	M	
1.2	Pre-start checks		✓	3B.4*	3D operations to DH/A of 200 feet (60m) or to higher minima if required by the approach procedure (autopilot may be used to the final approach segment vertical path)	M	
1.2.1	External		✓				
1.2.2	Internal	M	✓	3B.5*	2D operations to MDH/A and MAP	M	
1.3	Engine starting: Normal Malfunctions	M	✓	3B.6*	Flight exercises including simulated failure of the compass and attitude indicator: Rate 1 turns; Recoveries from unusual attitudes	M	
1.4	Taxiing	M	✓				
1.5	Pre-departure checks: Engine run-up (if applicable)	M	✓	3B.7*	Failure of localiser or glideslope		
				3B.8*	ATC liaison - Compliance, R/T procedure		
1.6	Take-off procedure: Normal with Flight Manual flap settings Crosswind (if conditions available)		✓	**Section 4 Arrival and landings**			
				4.1	Aerodrome arrival procedure	M	✓
1.7	Climbing: Vx/Vy Turns onto headings Level off	M	✓	4.2	Normal landing	M	✓
				4.3	Flapless landing	M	✓
				4.4	Crosswind landing (if suitable conditions)		N/A
1.8	ATC liaison - Compliance R/T procedure		✓	4.5	Approach and landing with idle power from up to 2000' above the runway (single engine aeroplane only)		✓
Section 2 Airwork (VMC)							
2.1	Straight and level flight at various airspeeds including flight at critically low airspeed with and without flaps (including approach to VMCA when applicable)		✓	4.6	Go-around from minimum height	M	✓
				4.7	Night go-around and landing (if applicable)		N/A
2.2	Steep turns (360° left and right at 45° bank)	M	✓	4.8	ATC liaison - Compliance, R/T procedure		✓
2.3	(i) Clean stall (ii) Approach to stall in descending turn with bank with approach configuration and power (iii) Approach to stall in landing configuration and power (iv) Approach to stall, climbing turn with take-off flap and climb power (single engine aeroplane only)	M	FAIL	**Section 5 Abnormal and emergency procedures (This section may be combined with sections 1 through 4)**			
				5.1	Rejected take-off at a reasonable speed	M	✓
				5.2	Simulated engine failure after take-off (single engine aeroplanes only)	M	✓
				5.3	Simulated forced landing without power (single engine aeroplanes only)	M	✓
2.4	Handling using autopilot and flight director (may be conducted in section 3) if applicable	M	✓	5.4	Simulated emergencies: (i) Fire or smoke in flight; (ii) Systems malfunctions as appropriate		✓
2.5	ATC Liaison - Compliance, R/T procedure		✓				
Section 3A En-route procedures VFR				5.5	Engine shutdown and restart (ME Skill Test only) (at a safe altitude if performed in the aircraft)		✓
3A.1	Flight plan, dead reckoning and map reading		✓	5.6	ATC liaison - Compliance, R/T procedure		✓
3A.2	Maintenance of altitude, heading and speed		✓	**Section 6 Simulated asymmetric flight**			
3A.3	Orientation, timing and revision of ETAs		✓	6.1*	Simulated engine failure during take-off	M	
3A.4	Use of radio navigation aids (if applicable)		✓		(at a safe altitude unless carried out in FFS or FNPT II) (This section may be combined with sections 1 through 5)		
3A.5	Flight management (flight log, routine checks including fuel, systems and icing)		✓				
3A.6	ATC liaison - Compliance, R/T procedure		✓	6.2*	Asymmetric approach and go-around	M	
* Shall be flown solely by reference to instruments. If this condition is not met during the Skill Test or Proficiency Check, the type rating will be restricted to VFR only.				6.3*	Asymmetric approach and full stop landing	M	
				6.4	ATC liaison - Compliance, R/T procedure		

Civil Aviation Authority Regulation 6

Regulation 6(5) of the Civil Aviation Authority Regulations 1991 provides as follows: Any person who has failed any test or examination which he is required to pass before he is granted or may exercise the privileges of a personnel licence may within 14 days of being notified of his failure request that the Authority determine whether the test or examination was properly conducted. In order to succeed you will have to satisfy the Authority that the examination or test was not properly conducted. Mere dissatisfaction with the result is not sufficient reason for appeal.

Examiner Report - Failure of Test, Check or Assessment of Competence

This form can be part filled in on screen then printed, completed, signed and submitted as instructed. Please complete this form in BLOCK CAPITALS using black or dark blue ink.

FALSE REPRESENTATION STATEMENT
It is an offence under Article 256 of the Air Navigation Order 2016 to make, with intent to deceive, any false representation for the purpose of procuring the grant, issue, renewal or variation of any certificate, licence, approval, permission or other document. This offence is punishable on summary conviction by a fine up to £5000, and on conviction on indictment with an unlimited fine or up to two years imprisonment or both.

Civil Aviation Authority Regulation 6
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1. APPLICANT'S DETAILS — To be completed by the Examiner

CAA Personal reference number (if known): 2 3 3 5 1 4 G Forename(s): STEPHEN (JIMMY)

Surname: PELLS Email address: jimmy_pells@jp.com

2. TEST CONDUCTED — To be completed by the Examiner

Aeroplane ☑ Helicopter ☐ Powered Lift ☐ Airship ☐ Balloon ☐ Sailplane ☐ RT ☐ SP ☑ MP ☐

Initial Issue ☐ Revalidation ☐ Renewal ☑

(Specify type of test or assessment): SEP(land) Renewal Series (if applicable):

Attempt: 1 Date: 04/4/21 Place of Test: Blackbushe (EGLK)

A/C or Sim Type: PA-28 A/C Registration/Approval No: G-BEXW Total Flight time: 1:00

3. REASONS FOR FAILURE — To be completed by the Examiner

Section	Sub Section	Reasons for Failure
2	2.3	Inadequate TEM: No pre stall checks conducted Incorrect technique used in stall recovery.

Further training: Mandatory ☑ Recommended ☐

Flight Hours: 1:00 FSTD Hours:

Specific Training Required: Standard stall recovery + HASEL checks

Examiner's Name: B.I.G. Chopper Examiner's No: 123456A

Authorising Competent Authority:

Non-UK Examiners - I have reviewed and applied the relevant national procedures and requirements of the UK CAA contained in version ..... of the Examiner Differences Document. ☐

Examiner's Signature: SD Date: 4/4/21

I understand that I have failed the items notified above. I also understand that I may not exercise the privileges related to that rating/ certificate.

Applicant's Signature: SPells Date: 4/4/21.

Copies of the report shall be submitted to (1) The applicant (2) The Applicant's Competent Authority (3) The Examiner (4) The Examiner's Competent Authority (if different).

Example 2

EXAMINERS REPORT - For Single Pilot Aeroplanes (SPA) Skill Test for Issue of Class and Type Ratings and Proficiency Checks for Revalidation and Renewal of Class, Type and Instrument Ratings, Revalidation by Experience of Class Ratings, excluding SP High Performance Complex Aeroplanes and Sea Class Ratings in accordance with Part-FCL. (European Commission Regulation (EU)No 1178/2011 as amended).

Civil Aviation Authority

Complete clearly in BLOCK CAPITALS using black or dark blue ink.

FALSE REPRESENTATION STATEMENT
It is an offence under the UK Air Navigation Order to make, with intent to deceive, any false representation for the purpose of procuringthe grant, issue, renewal or variation of any certificate, licence, approval, permission or other document. This offence is punishable on summary conviction by a fine, and on conviction on indictment with an unlimited fine or imprisonment or both.

1. APPLICANTS DETAILS — **To be completed by the Applicant**

CAA Personal Reference Number: 2 3 8 5 1 4 G

Forename(s): STEPHEN (JIMMY) Surname: PELLS Date of Birth: 14/05/66

Initial Issue ☐ Revalidation by Proficiency Check ☐ Revalidation by Experience ☐ or Renewal ☑

Type Rating ☐ including variants: ..... including type specific IR ☐

Class Rating ☑: SEP(land)

Expiry of previous or current type/class rating: 30/09/20

Stand-alone Instrument Rating (IR/SPA): SE ☐ ME ☐ Revalidation ☐ Renewal ☐

Expiry of previous or current IR/SPA: .....

I confirm that I have requested the above Skill Test or Proficiency Check or Revalidation by Experience.

Applicant's signature: ..... Date: 04/04/21

2. EXAMINERS REPORT OF TEST OR CHECK — **To be completed by the Examiner**

Date of Skill Test or Proficiency Check: 04/04/21 Location: EGLK

Start time (Chocks): 0900 Finish time(Chocks): 1000 Total duration: 1:00 (HH:MM)

Aircraft Type/Class including variants used: SEP(land) PA28 Aircraft Registration: G-BOOF

Identification Number of FSTD used: ..... (to be in accordance with Commission Regulation (EU) 1178/2011 as retained (and amended in UK domestic law) under the European Union (Withdrawal) Act 2018

Competent Authority issuing qualification certificate for FSTD: .....

Result of Skill Test or Proficiency Check: Pass ☐ Partial Pass ☑ Fail ☐ (if fail or partial pass also complete SRG 2129)

Revalidation by Experience of aeroplane class or classes: .....

I confirm that the applicant has met the requirements of Part-FCL.740.A for Revalidation by experience:

Expiry of new Type/Class Rating: ..... I have ☐ I have not ☐ endorsed the Certificate of Revalidation in the applicant's licence.(If not signed also complete SRG 1119).

Stand-alone Instrument Rating (IR/SPA): Pass ☐ Partial Pass ☐ Fail ☐ (if fail or partial pass also complete SRG 2129)

Expiry of new IR/SPA: ..... SE ☐ ME ☐

I have ☐ I have not* ☑ endorsed the Certificate of Revalidation in the applicant's licence (*If not signed also complete SRG 1119).

If cross-crediting is claimed for revalidation of the IR/SPA, state the other type/class rating for which an LPC including IR was completed and the expiry date of that rating: ..... Type or Class Rating: ..... Expiry of Rating: .....

3. PBN — **To be completed by the Examiner**

I confirm that the applicant has been tested in PBN elements as relevant (Commission Regulation EU 1178/2011 as amended – Annex I, Appendix 7 and 9 Refers) ☐

I confirm that this skill test/proficiency check did not include an RNP APCH and that the applicant has been advised that:
- the PBN privileges of their IR does not include an RNP APCH, and that
- this restriction can be lifted upon completing a proficiency check which includes an RNP APCH. ☐

4. CONFIRMATION — **To be completed by the Examiner**

I have found that the applicant's instruction and experience comply with Part FCL and confirm that all the required manoeuvres and exercises have been completed and that the applicant's theoretical knowledge has been confirmed by verbal examination (where applicable) in accordance with Appendix 9 to Part-FCL.

Examiner's Name: B. I. G. chopper Examiner's Number: 1 2 3 4 5 6 A

Authorising Competent Authority: UK CAA

Examiner's Signature: ..... Date: 4/4/21

Non-UK Examiners - I have reviewed and applied the relevant national procedures and requirements of the UK CAA.

UK CAA Examiner Designation Reference: .....

Declaration of applicant - I declare that the information provided on this form is correct and I have been informed of the result of the Skill Test or Proficiency Check or Revalidation of the Class Rating(s) by Experience.

Applicants signature: ..... Date: 4/4/21

Copies of the report shall be submitted to (1) The Applicant, (2) The Applicant's Competent Authority, (3) The Examiner, (4) The Examiner's Competent Authority (if different), (5). The Examiner should also complete Form SRG2199 as required, (6)

English Language Proficiency assessments should be completed using Form SRG1199.

Applicant's details

Name: S.J. PELLS CAA Ref No: 2385146 A/C Type/Reg: G-BOOF FLT Time: 1:00 Date: 4/4/21

Manoeuvres/Procedures M (Mandatory)			Pass /Fail
Section 1 Departure			
1.1	Pre-flight including: Documentation Mass and Balance Weather briefing NOTAM		✓
1.2	Pre-start checks		✓
1.2.1	External		✓
1.2.2	Internal	M	✓
1.3	Engine starting: Normal Malfunctions	M	✓
1.4	Taxiing	M	✓
1.5	Pre-departure checks: Engine run-up (if applicable)	M	✓
1.6	Take-off procedure: Normal with Flight Manual flap settings Crosswind (if conditions available)		✓
1.7	Climbing: Vx/Vy Turns onto headings Level off	M	✓
1.8	ATC liaison - Compliance R/T procedure		✓
Section 2 Airwork (VMC)			
2.1	Straight and level flight at various airspeeds including flight at critically low airspeed with and without flaps (including approach to VMCA when applicable)		✓
2.2	Steep turns (360° left and right at 45° bank)	M	FAIL
2.3	(i) Clean stall (ii) Approach to stall in descending turn with bank with approach configuration and power (iii) Approach to stall in landing configuration and power (iv) Approach to stall, climbing turn with take-off flap and climb power (single engine aeroplane only)	M	✓
2.4	Handling using autopilot and flight director (may be conducted in section 3) if applicable	M	✓
2.5	ATC Liaison - Compliance, R/T procedure		✓
Section 3A En-route procedures VFR			
3A.1	Flight plan, dead reckoning and map reading		✓
3A.2	Maintenance of altitude, heading and speed		✓
3A.3	Orientation, timing and revision of ETAs		✓
3A.4	Use of radio navigation aids (if applicable)		✓
3A.5	Flight management (flight log, routine checks including fuel, systems and icing)		✓
3A.6	ATC liaison - Compliance, R/T procedure		✓
* Shall be flown solely by reference to instruments. If this condition is not met during the Skill Test or Proficiency Check, the type rating will be restricted to VFR only.			

Manoeuvres/Procedures M (Mandatory)			Pass /Fail
Section 3B Instrument flight			
3B.1*	Departure IFR	M	
3B.2*	En-route IFR	M	
3B.3*	Holding procedures	M	
3B.4*	3D operations to DH/A of 200 feet (60m) or to higher minima if required by the approach procedure (autopilot may be used to the final approach segment vertical path)	M	
3B.5*	2D operations to MDH/A and MAP	M	
3B.6*	Flight exercises including simulated failure of the compass and attitude indicator: Rate 1 turns, Recoveries from unusual attitudes	M	
3B.7*	Failure of localiser or glideslope		
3B.8*	ATC liaison - Compliance, R/T procedure		
Section 4 Arrival and landings			
4.1	Aerodrome arrival procedure	M	✓
4.2	Normal landing	M	✓
4.3	Flapless landing	M	✓
4.4	Crosswind landing (if suitable conditions)		✓
4.5	Approach and landing with idle power from up to 2000' above the runway (single engine aeroplane only)		✓
4.6	Go-around from minimum height	M	✓
4.7	Night go-around and landing (if applicable)		N/A
4.8	ATC liaison - Compliance, R/T procedure		✓
Section 5 Abnormal and emergency procedures (This section may be combined with sections 1 through 4)			
5.1	Rejected take-off at a reasonable speed	M	✓
5.2	Simulated engine failure after take-off (single engine aeroplanes only)	M	✓
5.3	Simulated forced landing without power (single engine aeroplanes only)	M	✓
5.4	Simulated emergencies: (i) Fire or smoke in flight; (ii) Systems malfunctions as appropriate		✓
5.5	Engine shutdown and restart (ME Skill Test only) (at a safe altitude if performed in the aircraft)		N/A
5.6	ATC liaison - Compliance, R/T procedure		✓
Section 6 Simulated asymmetric flight			
6.1*	Simulated engine failure during take-off (at a safe altitude unless carried out in FFS or FNPT II) (This section may be combined with sections 1 through 5)	M	
6.2*	Asymmetric approach and go-around	M	
6.3*	Asymmetric approach and full stop landing	M	
6.4	ATC liaison - Compliance, R/T procedure		

Civil Aviation Authority Regulation 6

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Civil Aviation Authority Regulation 6
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1. APPLICANT'S DETAILS — To be completed by the Examiner

CAA Personal reference number (if known): 2385146 Forename(s): STEPHEN (Jimmy)

Surname: PELLS Email address: jimmy-pells@jp-com

2. TEST CONDUCTED — To be completed by the Examiner

Aeroplane ✓ Helicopter ☐ Powered Lift ☐ Airship ☐ Balloon ☐ Sailplane ☐ RT ☐ SP ✓ MP ☐

Initial Issue ☐ Revalidation ☐ Renewal ✓

(Specify type of test or assessment): SEP (land) Renewal Series (if applicable):

Attempt: 1 Date: 4/4/21 Place of Test: Blackbushe (EGLK)

A/C or Sim Type: ~~C152~~ PA28 A/C Registration/Approval No: G-BOOF Total Flight time: 1:00

3. REASONS FOR FAILURE — To be completed by the Examiner

Section	Sub Section	Reasons for Failure
2	2.2	Inadequate lookout and loss of SCO during steep turn

Further training: Mandatory ✓ Recommended ☐

Flight Hours: 1:00 FSTD Hours:

Specific Training Required: Steep turns

Examiner's Name: R.I.G. Chopper Examiner's No: 123456A

Authorising Competent Authority: UK CAA

Non-UK Examiners - I have reviewed and applied the relevant national procedures and requirements of the UK CAA contained in version ..... of the Examiner Differences Document. ☐

Examiner's Signature: [signature] Date: 4/4/21

I understand that I have failed the items notified above. I also understand that I may not exercise the privileges related to that rating/ certificate.

Applicant's Signature: [signature] Date: 4/4/21

Copies of the report shall be submitted to (1) The applicant (2) The Applicant's Competent Authority (3) The Examiner (4) The Examiner's Competent Authority (if different).

CRI SE Air Exercise 1: 'The 'Partial Pass'

(1) Start-Up, Taxi & Take-off from unfamiliar seat.
(2) Climb to safe altitude from unfamiliar seat.
(3) Precautions before stalling: HASELL etc.
(4) Stalling & Approach to the Stall. Symptoms & Recovery Technique in the following configs:
- (i) Clean, Straight & Level, Idle Power.
- (ii) Landing gear down, Approach Flaps & Power, Level, 20° Angle of Bank turn L or R.
- (iii) Landing configuration, Gear down, Full flap, Approach Power set, S&L.
- (iv) Climb power, go-around flap, steep climbing attitude (if required).

(5) Recovery at the Fully Stalled Condition and at the incipient stage.
(6) Secondary Stalls.
(7) Incipient Spinning (if required). Full Spinning (if required/desired).
(8) Steep/Advanced Turns.
- (i) Level 45° AoB. 60° AoB if desired.
- (ii) Steep Descending Turns.
- (iii) Recovery from Spiral Descent.

(9) Rejoin circuit for go-around from unfamiliar seat.
(10) Further circuit to touch and go from unfamiliar seat (student lever selections).
(11) Further variant circuits as required from unfamiliar seat.

Considerations

Stalling

- Pre-stalling Checks (HASELL). Sufficient height for safe recovery; aircraft configuration; security of occupants; no loose articles; engine settings, temperatures and pressures; suitable location; clear of cloud and other aircraft; Operations Manual requirements (W&B).
- Approach to the Stall. Entry to stall; symptoms prior to stall; recognition of the stall and symptoms; standard stall recovery.
- Recovery from Stalls when Power is not Available. Greater movement of control column to regain control; more height lost in recovery.
- Stall with Wing Drop and Standard Recovery. Correct use of flying controls; recovery with minimum height loss.
- Standard Recovery at Stall Warning. Small control movement to maintain attitude; prevent yaw; no height loss.
- Approach to the Stall Warning in the Landing Configuration and Standard Stall Recovery. Importance of early recognition and correct recovery; danger of stalling on the approach.
- Approach to the Stall Warning Recovery from a Banked Attitude (Simulating base leg to final turn – level, 20° AoB R or L, approach power set say 1500 rpm). Effect of bank on stalling speed; correct use of flying controls during recovery; check IAS restored before removing bank.

Spinning (If Required/desired)

- Incipient Spinning
- Spin Recovery at The Incipient Stage.
- Pre-Spinning Checks. (HASELL) Sufficient height for safe recovery; configuration; security of occupants; no loose articles; engine control settings; Ts & Ps; fuel; suitable location; clear of cloud and other aircraft; Operations Manual requirements.
- Symptoms of the Incipient Stage. Undemanded roll; control reversal; increased rate of descent.
- Recovery After a Level Flight Entry. Incipient recovery actions; use of full spin recovery if incipient recovery actions ineffective after ½ turn.
- Recovery After Entry from Other Attitudes. Importance of taking prompt recovery action: if incipient recovery action ineffective then use full spin recovery; importance of closing throttle before aircraft stabilised in spin.

Steep Turns

- Steep turns. 45° minimum AoB.
- Addition of power
- Steep turns. 60° AoB.

Typical Pilot Errors

Stalling

- Failure to carry out HASELL (or similar) checks prior to each stall.
- Failure to recognise the approach to the stall or the fully stalled condition.
- Failure to correctly apply the Standard Stall Recovery.
- Loss of direction control during the stall recovery.
- In slow flight – poor power and attitude co-ordination.

Steep Turns

- Failure to perform adequate lookout throughout the steep turn.
- Failure to maintain entry speed and altitude during a steep turn.

CRI SE EXERCISE 2: The 'Club Checkout':

Scenario:

A club checkout flight designed by the Trainee CRI. The purpose of this flight is for the trainee CRI to get a feel for how to 'check out' a pilot to a new aircraft type, new airfield or new flying group. He must decide which items to include in the checkout. Consideration should be given to the new pilot's prior experience before building a plan for ground brief and flying exercises. **Remember:** Start from where the student is!

CRI SE Ex2: The 'Club Checkout'- Long Briefing Topics:

(1) Booking in and out.
(2) Aircraft Tech Log & MEL.
(3) A/C Documents.
(4) Aircraft Features and Instrumentation.
(5) External & Internal Checks – The importance of a written checklist.
(6) Taxiing & Power Checks – Use of checklist. Pre-flight normal & non-normal briefing.
(7) Take-off & Climb. Knowledge of and adherence to: (i) Published Speeds & power settings, (ii) Local Procedures
(8) Cruise Flight:
(i) Fuel consumption considerations. (ii) Trimming controls. (iii) Flight Controls: elevator, aileron and rudder;
(9) Operation of wing Flaps:
(i) Vfe. Concept of 'Limitation – Operation – Indication'.
(ii) effect of flaps on pitch attitude and airspeed.
(10) Operation of Landing gear:
(i) Knowledge of limiting speeds. 'Limitation – Operation – Indication'.
(ii) effect landing gear on pitch attitude, airspeed and power requirement.
(11) Use of Mixture controls; Alternate air or Carburettor heat controls; Operation of Cowl flaps as fitted;
(12) Safe use of Cabin ventilation and heating systems;
(13) Operation of Autopilot and Navigation systems as fitted. As a minimum know how to go 'Direct To' a waypoint.
(14) Steep Turns (if required)
(15) Stalling (if required)
(16) Operation and use of the other systems (as applicable to type, such as de-icing equipment);
(17) Practice Forced Landing without Power (if required)
(18) Any other exercises as determined by the trainee CRI.
(18) Descending:
(i) pre-descent checks; (ii) normal descent;
(iii) selection of throttle, pitch & mixture controls; (iv) engine cooling/icing considerations;
(19) Post flight activities & Tech Log. Pilot Logbook.

CRI SE Air Ex2: The 'Club Checkout'

(1) Pre-Flight Planning & Authorisation. Met, NOTAMS etc.
(2) Aircraft Documents check.
(3) Aircraft External & Internal checks from checklist.
(4) Aeroplane Familiarisation.
(3) Engine Starting procedures. Cold, Hot, Flooded. Priming.
(4) Taxying. Speed, Instrument checks.
(5) Take-Off & Initial Climb into wind or crosswind:
- (i) ATC considerations;
- (ii) Directional control and use of power;
- (iii) Lift-Off and other critical speeds;
- (iv) Crosswind effects and procedure;
- (v) Short/Soft Field take-off procedures.
- (vi) After Take-Off Procedures (Power, speed, local rules)

(6) Climbing:
- (i) After Take-Off Checks;
- (ii) Power Selection for normal & maximum rate climb;
- (iii) Effect of Altitude on MP, full throttle height;
- (iv) Level off - power selection;
- (v) En-Route Climb/Cruise Climb;
- (vi) Max Angle of Climb;
- (vi) Altimeter Setting Procedures;
- (viii) Prolonged Climb and use of cowl flaps;

(7) Straight & Level flight;
- **A:** At normal cruising power:
- **B:** Instrument appreciation (if appropriate);
- **C:** Operation of flaps (in stages):
- **D:** Operation of landing gear:
- **E:** Use of mixture, alternate air & carburettor heat controls;
- **G:** Operation of cowl flaps;
- **H:** Operation of cabin ventilation or heating systems;
- **I:** Operation and use of other systems as applicable to type;
- **J:** Use of Autopilot and/or GNSS systems.

(8) Steep Turns (if required)
(9) Stalling(if required)
(10) PFL without power (if required)
(8) Descending;
- (i) Pre-descent checks;
- (ii) Power selection: MP & RPM;
- (iii) Powered descent (cruise descent);
- (iv) Engine cooling considerations: use of cowl flaps;
- (v) levelling off;
- (vi) Descending with flaps;
- (vii) Descending with landing gear down;
- (viii) altimeter setting procedure;
- (xi) limitations in turbulence (Vno).

(9) Circuits.
(10) Other Exercises as determined by trainee CRI.
(11) Actions After Flight.

Considerations

Aircraft General

- External Features. Relevant items as defined by checklist. Precautions when handling propeller. Moving the aircraft manually. No smoking.
- Internal features. How to enter and leave the a/c. General layout, door operation, equipment stowage, control locks, seat and harness adjustments, heating and ventilation.
- Cockpit & Controls. Familiarisation with all controls and the location of instruments. The importance of systematic checks.
- Introduction to the Check List. Explain the methods of use on the ground and in the air. Specify any sequences to be memorised.

Aircraft Systems, Normal and Abnormal Operation

- All Systems, Normal Operation. Explain/demonstrate check list procedures.
- System Failures, Abnormal Operation and procedures. Explain/demonstrate check list procedures.

Pre and Post Flight Procedures

- Pre-Departure Procedures. Flight authorisation; weather and flight information; loading, weight and performance calculations; flight planning and flight plans as applicable; aircraft documents; equipment required and aircraft acceptance.
- Check List Procedures. Explain/demonstrate/practice the following:
  A: Pre-flight inspection. Seat & Pedal adjustments.
  B: Internal checks & before start checks.
  C: Starting procedure.
  D: Checks after starting.
  E: Radio and instrument checks.
  F: Power check and pre-take off checks.
- Arrival Procedures. Parking & closing down checks; a/c security and picketing; ATC requirements; aircraft & school documents/procedures.

Taxying

- Basic Control Technique, Precautions and Taxying Checks.
- Preliminary Checks and Lookout. Adjustment of seat and rudder pedals; throttle friction; windscreen clear of mist etc; brakes checked.
- Starting-off, Control of Speed and Stopping. Control column position; inertia; avoidance of power against brake; engine handling; assessment of correct speed; dangers of harsh braking; RPM setting after stopping.
- Control of Direction and Turning. Use of nose wheel steering, rudder and brake as appropriate.
- Effects of Wind. Weathercock tendency; turning into and out of wind; control of speed downwind; max permitted surface wind for taxying.
- Effects of Ground Surface. Gradient; grass and hard surfaces; precautions when taxying from one surface to another; wet and slippery surfaces; uneven surfaces.
- Special Precautions and Abnormal Procedures. The apron; use of marshallers and marshalling signals; turning in a confined space; avoidance of locked wheel turns; parking; possibility of damage from slipstream of other aircraft.
- Taxying Checks. All round lookout; brakes, flight and engine instruments; full and free movement of rudder. Instrument checks.
- Taxy Emergencies. Explain actions to be carried out in the event of brake and steering failures.

En-Route Flight

- Straight & Level – En-Route Flight:
- Setting of correct attitude, power and speed.
- Use of mixture & cowl flaps.
- Fuel management.
- Navigation & Log keeping

Take-Off & Climb

- Take Off into Wind: Pre-Take Off and Runway Checks. Check list; positioning at holding point; R/T procedures; traffic sequencing; adherence to correct procedure when entering the runway; nose (or tail) wheel straightened; runway checks.
- Take Off and Initial Climb to Circuit Height. Reference point; keeping straight; throttle handling; rotation; gradual transition to climbing attitude; checks; trim; noise abatement procedures; turn onto crosswind leg; drift allowance; levelling off; position to turn downwind.
- Take Off and Circuit Departure. Planning departure to conform with local procedures/traffic patterns; RT clearance; altimeter settings.

Crosswind Take Off:

- Calculation of Crosswind Component. Obtaining surface wind from ATC before take off; methods of computing crosswind component; reference to PoH for crosswind limits for take off.
- Take Off and Initial Climb. Anticipation and prevention of weathercocking; clean lift off; allowance for drift when airborne.
- Performance Take Off.

Short/Soft Field Take-Off

- Technique to 50ft. Reference to PoH for scheduled take off technique; vital actions; use flap only if take off data available; use maximum take off run available; power anticipation; lift off speed; climb technique to 50ft; performance calculations.
- Effects of Different Types or Contaminated Surfaces on Control and Take-Off Distance. Comparison between runway and grass surfaces; wet/slippery surface; dry/wet snow; slush; ice. Reference to PoH, Performance tables and AICs for extra allowance and limitations in respect of grass surface, dry/wet snow, and slush.
- Noise Abatement Procedures. Local Procedures.
- Effect on take-off roll and climb performance; routings.

Steep Turns

See Ex1.

Stalling

See Ex1.

Approach & Landing

See Circuit Exercise.

Typical Pilot Errors

Aircraft Systems, Normal and Abnormal Operation

- Failure to use checklist, or the missing of checklist items.
- Failure to understand magnetos and their checks.

Taxying

- Use of brake against power during taxy.
- Weaving on the taxyway whilst conducting instrument checks. Use natural turns. Plan ahead.
- Failure to select and maintain the correct attitude and therefore to maintain desired altitude.
- Failure to lean the mixture and manage fuel appropriately.

Pre and Post Flight Procedures

- Failure to check and/or understand aircraft documents.

Take-Off & Climb

- Use of incorrect or unapproved flap setting for take-off or landing.
- Use of incorrect technique with regard to RW surface or wind direction.
- Failure to keep wings level in a crosswind take-off. Failure tolay off the drift after lift off.
- Failure to calculate or understand the crosswind component.
- Failure to keep the aircraft balanced with rudder, resulting in drift to the left.
- Chasing of airspeed in the climb.
- Poor lookout. Poor monitoring of Ts & Ps in the climb.
- Excessive use of pitch trimmer.

Steep Turns

See Ex1.

Stalling

See Ex1.

Approach & Landing

See Circuit Exercise.

CRI SE EXERCISE 3: Circuits

Scenario:

The student has come to you for help as he is struggling with circuits and landings. A pre-flight chat should enable the trainee CRI to develop a lesson plan for ground brief and flight. **Remember:** Start from where the student is and take him to where he needs to go!

see PPL Lesson 12-14 plus the following:

CRI SE Ex3: Circuits - Long Briefing Topics:

(1) Circuit layout and local considerations. Use of diagrams. Use of perspective in place of ground features.
(2) Standard Overhead Join – Discuss.
(3) ATC interaction.
(4) Pre-Landing checks. Including landing gear considerations for retractable types.
(5) Management of touch and go landings (if planned).
(6) Effect of wind on all legs of the circuit.
(7) Normal Circuit & Landing.
(8) Flapless Circuit & Landing.
(9) Glide Approach & Landing.
(10) Short/Soft Field Approach & Landing.
(11) Bad Weather Circuit.
(12) Go-around. Including go-around from all circuit positions.
(13) Adjustment of speed and extending of legs due to circuit traffic – considerations.

CRI SE Air Exercise 3 - Circuits:

(1) Normal Take-Off, Circuit, Approach & Landing.
(2) Management of actions during touch & go landings.
(3) Flapless Circuit & Landing.
(4) Glide Approach & Landing.
(5) Short/Soft Field Approach & Landing.
(6) Bad Weather Circuit.
(7) Go-around. Including go-around from all circuit positions
(8) Standard Overhead Join.

Considerations

Circuit Join & Procedures

- Airfield Procedures. Local Procedures & Noise abatement. Circuit direction.
- Airfield Approach Checks. Aircraft check list or use of mnemonic; R/T procedures; altimeter settings.
- Joining the Circuit. Different joining procedures as appropriate; R/T procedures; ground signals; traffic sequencing.
- Circuit Pattern & Pre-Landing Checks. Positioning on downwind leg; R/T procedures; checklist or use of mnemonic; IAS/power setting; circuit height/alt; position to turn onto base leg.

Engine Assisted (Normal) Approach and Landing

- The Approach.
  A: Base Leg. Drift allowance; use of flap; power reduction; IAS; position to turn onto final approach; noise abatement procedures.
  B: Final Approach. R/T procedure; control of attitude and power to achieve correct IAS and approach path; use of flap; reduction to threshold speed, effect of wind on approach and touchdown speeds.
- Round Out (Flare) and Landing. Effect of wind gradient; judging round out; use of throttle; safeguarding the nose wheel.
- Control after Landing. Keeping straight; use of brakes and nose wheel steering; clearing landing path; R/T procedure; after landing drills.

Go-Around/Baulked Landing Procedures

- Reasons for Go-around. Application of power; keeping straight; attitude for correct climbing IAS for flap selected; flap raised in stages at safe height; R/T procedure; checks; altimeter settings.
- Reasons for a Baulked Landing.
  A: Application of power; keeping straight; attitude for correct climbing IAS for flap selected; flap raised in stages at safe height; R/T procedure; checks; altimeter settings.
  B: Causes of, and action in the event of, porpoising; if aircraft bounces hold control wheel firmly aft of the centre to hold a nose up attitude; apply full power to go around.

Touch and Go Landings

- Choice of Touch and Go or taxy back. Appreciation of runway length;
- Setting of flap/CH before power application, engine handling; use of flap; R/T procedure; checks.
- Who will handle what.

Glide Approach & Landing without the use of Power

- The Approach. Position to close throttle depending on wind strength; methods of regulating the approach; use of flap; approach and threshold speeds; checks; R/T procedure.

Round Out/Flare and Landing

- Larger attitude change; round out started higher; 2 stage round out in strong wind conditions; effect of wind gradient.

Crosswind Circuit and Landing

- Calculation of Crosswind Component. Reference to PoH for aircraft's demonstrated crosswind or limitations.
- Circuit Adjustments. Allowance for drift on initial climb, downwind leg and final approach; allowance for change in radius of turn and ground speed in achieving correct circuit pattern.
- The Approach. Drift allowance; recommended IAS; use of flap.
- Round Out and Landing. Use of rudder to align aircraft with landing path just before landing.
- Control after Landing. Keeping straight; use of braking & nose wheel steering; R/T procedures; after landing checks.

Flapless Landing

- Check of Landing Distance. Reference to PoH for required distances and to the AIP for available distances.
- Circuit Adjustments. Change in groundspeed; position to turn onto base leg.
- The Approach. Comparison of power setting with that used on normal engine assisted approach; higher nose attitude; difference in approach and threshold speeds; handling differences.
- Round Out and Landing. Longer period of float; longer landing run; judging the round out; need for early touch down.

Landing on Alternative Surface: Grass, Gravel, Sand or Snow/Ice Runway

- The Approach.
  A: To a Grass Field. Lining up with the landing path on final approach; use of marker boards;
  traffic procedures when staggered landings are taking place; RT procedures.
  B: To a Paved Runway. Lining up with runway on final approach; use of approach path guidance systems; traffic and R/T procedures.
- Round Out and Landing.
  A: Grass Field, Snow/Ice. Judgement of round out height; landing on an undulating surface or surface with no contracst.
  B: Paved Runway. Judgement of round out height; runway hazards; threshold lights; edge markers and drains.
- Control after Landing.
  A: Grass Field. Use of reference point to keep straight; use of brakes and nose wheel steering; clearing the landing path; R/T procedures; after landing checks.
  B: Paved Runway. Keeping straight; use of brakes and nose wheel steering; clearing the runway; R/T procedure; after landing checks.
  C: Snow/Ice: Maintanence of direction.

Short Field/Performance Approach & Landing (Landing in Minimum Distance)

- The Approach to 50'. Accurate control of IAS and approach path, use of flap etc;
- Reference to PoH for details of handling technique/Speed, How to calculate approach speed from stall speed.
- Scheduled Min Field Length Technique from 50'. Reference to PoH for details of handling technique; need for accurate touchdown position.
- Control after Landing. Use of flaps in accordance with scheduled technique; use of brakes.
- Effects of Surface Conditions on Landing Distance, Control and Braking Technique. Control and braking techniques on wet surface, wet and dry snow, slush, ice, hard and soft natural surfaces; conditions for and avoidance of aquaplaning.

Typical Pilot Errors

Circuit Join & Procedures

- Failure to understand and correctly execute a Standard Overhead Join.
- Failure to pre-brief local procedures from the AIP (or similar).
- Missing of airfield approach checks. Mixture.
- Poor circuit spacing, and poor knowledge of how to deal with lack of spacing.
- Failure to allow for wind on all legs of the circuit.
- Forgetting Pre-Landing Checks.
- Failing to set Max RPM on a VP Prop prior to short final.
- Poor understanding of carburettor heat requirements.
- Poor R/T as appropriate to different levels of ATC provision.

Normal Approach and Landing

- Poor airspeed control on final.
- Poor judgement of vertical profile on final.
- Large pitch and lateral corrections on final.
- Inappropriate flap settings.
- Failure to concentrate on the important cues during approach. ie looking at the altimeter on final.

Go-Around/Baulked Landing Procedures

- Failure to execute a go-around when needed.
- Lack of knowledge of go-around actions.
- Lack of knowledge of local procedures following a go-around.

Touch and Go Landings

- Applying take-off power before retracting flap to take-off position.
- Failure to turn off the carb heat.
- Failure to set correct take-off flap setting.
- Failure to maintain direction while reconfiguring for take-off.

Glide Approach & Landing without the use of Power

- Taking off the power too soon.
- Taking flaps too early.
- Failure to realise that wind and temperature affect the gliding range significantly.

Round Out/Flare and Landing

- Excessive braking after landing.
- Looking at the runway in front of the aircraft, rather than at the far end.
- Poor roundout/flare technique. Too high, too much pitch change. Correction of bounce or balloon.
- Landing on the left hand side of the runway.
- Landing deep.
- Failure to guard the nosewheel, usually due to excessive speed on final.
- Looking at the ASI during flare.

Crosswind Circuit and Landing

- Poor or incorrect crosswind landing technique.
- Failure to calculate or understand the crosswind component.

Flapless Landing

- Failure to realise that the lack of flaps will make getting down more difficult.
- Excessive speed on final resulting in long float.

Landing on Alternative Surface: Grass, Gravel, Sand or Snow/Ice Runway

- Inappropriate flap setting.
- Incorrect technique based on surface in question.

CRI EXERCISE 4: Emergency Procedures

CRI SE Exercise 4: Emergency Procedures - Long Briefing Topics:

(1) TEM during in-flight emergency training – touch drills, altitude selection
(2) Emergency drills (not including engine failure), as applicable to type. Discuss use of checklists.
- (i) Cabin Fire.
- (ii) Electrical Failures.
- (iii) Lost Procedure.
- (iv) Radio Failure
- (v) Instrument failure (ASI etc)

(3) Engine Fire at altitude. Drills, considerations.
(4) Engine Failure at altitude -
- (i) PFL without power. Considerations, Drills & Checks, Practice Mayday call, Field selection, Management of descent, Engine warming, Go-around.

(5) EFATO. Stress importance of prompt action.
(6) Flight Control Problems - Flaps unavailable, electric trim runaway, jammed elevator etc.
(7) Engine Control Problems - Stuck Throttle at full power, RPM governor failure.
(8) Emergency descent procedures. Reasons for.
(9) Rejected Take-Off (RTO)

CRI SE Air Exercise 4 - Emergency Procedures:

(1) Taxy Emergencies
(2) Cabin Fire Drill – use of checklist - subsequent loss of electrics - radio failure, flapless approach.
(3) Engine Fire – Actions, management, subsequent actions.
(4) Engine Failure at altitude – PFL, Drills & Checks, Go-around.
(5) EFATO - usually after PFL. Actions.
(6) Electrical failures – loss of all electrics, electrical fire, loss of alternator, over-voltage.
(7) Procedures when lost.
(8) Operation on reduced instruments - ASI failure
(9) Flight Control Problems – Flaps unavailable, electric trim runaway, jammed elevator etc.
(10) Engine Control Problems - Stuck Throttle at full power, RPM governor failure.
(11) Emergency Descent Procedure.
(12) Rejected take-off/RTO from reasonable speed.

Considerations

Note: All emergency procedures should be taught and checked in the aircraft. Where airborne simulations are not possible these should be done on the ground as above.

Fire Drills

- Engine fire on the ground. Explain/demonstrate check list procedures and drills.
- Engine fire in the air. Explain/demonstrate check list procedures and drills.
- Cabin fire. Explain/demonstrate check list procedures and drills.
- Electrical fire. Explain/demonstrate check list procedures and drills.

Emergency Drills

- Location and use of emergency equipment.
- Emergency landing/ditching procedures.
- Location and operation of escape hatches.
- Aircraft evacuation, land/water.

Practice Forced Landing Without Power (PFL)

- Approaches from 1500’ downwind LHC.
- Glide Approach with Landing on the Airfield.
- Glide Approaches to Go-around over Selected Area. Altimeter setting and assessment of ground elevation; estimation of wind direction; apparent difference in circuit size when making an approach to a small field; adherence to legal minima.
- Full Forced Landing Procedure
- Full PFL Procedure to Go-around, Including selection of Field and All Drills. Factors influencing choice of field or landing area; immediate actions in the event of engine failure; gliding distance; effect of wind; altimeter settings; descent plan and key positions, provision for change of plan; checks for causes of engine failure; engine handling during practices; R/T procedures; legal minima for go around; crash landing checks; base leg, final approach and landing; actions after landing.

Engine Failure after Take-off (EFATO)

- Take Off Safety Speed Considerations. Reference to PoH to obtain take off safety speed; implications of TOSS; correct take off technique.
- Control following Engine Failure on the Ground. Control following an engine failure during the take off run before lift off.
- Control following Engine Failure after Take-Off. Control and actions following an engine failure during the initial climb; gliding attitude and speed; choice of landing area; use of flap; danger of attempting to turn back. Obsession with +/- 30°.
- Emergency Drills. Crash checks including fuel and ignition off; if possible R/T distress call and Battery Master Switch off.

Engine Failure after Take-off (EFATO)

- Rejected take-off/RTO at reasonable speed. Reasons for.
- Avoidance of excessive braking. Directional control.
- Further actions following an RTO.

Typical Pilot Errors

Fire Drills

- Failure to use the aircraft checklist if time permits
- Tendency to rush towards landing in a field when better options may be available.

Emergency Drills

- Failure to use the aircraft checklist if time permits. Failure to know which checklists are available.

Practice Forced Landing Without Power (PFL)

- Prioritisation of tasks. Mayday Call – Failure to make a call, or not knowing current position.
- Inadequate trimming.
- Poor choice of field. Light green best, brown worst.
- Landing downwind.
- Failure to assess why the engine has failed.

Engine Failure after Take-off (EFATO)

- Failure to immediately lower the nose and adopt the glide speed/attitude.
- Hesitancy in identifying a suitable landing area.
- Fixation on completing 'Crash' drills or R/T at the expense of flying the manoeuvre accurately.

Engine Failure after Take-off (EFATO)

- Failure to immediately begin the RTO procedure.
- Forgetting to close the throttle.
- Stopping the aircraft but not having a plan as to what comes next.

CRI SE EXERCISE 5: 'The Experienced Airline Pilot'

Scenario:

This pilot is a current and experienced airbus pilot with a major airline. His SEP rating expired over 10 years ago and he wants to renew it in order to do some leisure flying. You will need to identify areas where the pilot may struggle and devise a programme of training to suit his particular needs.
Remember: Start from where the student is and take him to where he needs to go!

CRI SE Ex5: 'The Experienced Airline Pilot' - Long Briefing Topics:

(1) Familiarisation with the aircraft type to be used.
(2) Content of the SEP (land) Prof Check. Relevant Sections of **SRG 1157**.
(3) Discussion of each air exercise in the check.
(4) Discussion of Navigation requirements.
(5) Identification of areas where an airline pilot will need extra training.

CRI SE Air Exercise 5 - 'The Experienced Airline Pilot':

(1) Air training carried out.

CRI SE EXERCISE 6: The 1 hour Training Flight with an Instructor

Scenario:

The student has come to you as he needs an hour with an instructor in order to revalidate his SEP(land) rating by experience. You will need to plan the flight and deal with the paperwork involved.

CRI SE EXERCISE 6: The 1 hour Training Flight with an Instructor – Short Briefing Topics

(1) Licence Inspection
(2) Paperwork & Forms
(3) Planning the lesson

CRI SE Air EXERCISE 6: The 1 hour Training Flight with an Instructor – Suggested Activities

(1) Normal Take-Off, Circuits, Approach & Landing.
(2) Revise PFLs
(3) Revise Stalling
(4) Revise Navigation
(5) Land at a different aerodrome (grass, gravel, A/G)
(6) Transit of controlled airspace
(7) Familiarisation of a new aircraft type
(8) Differences training (VP Prop, Retractable gear etc)

After the flight, deliver a short debrief and complete any paperwork correctly.

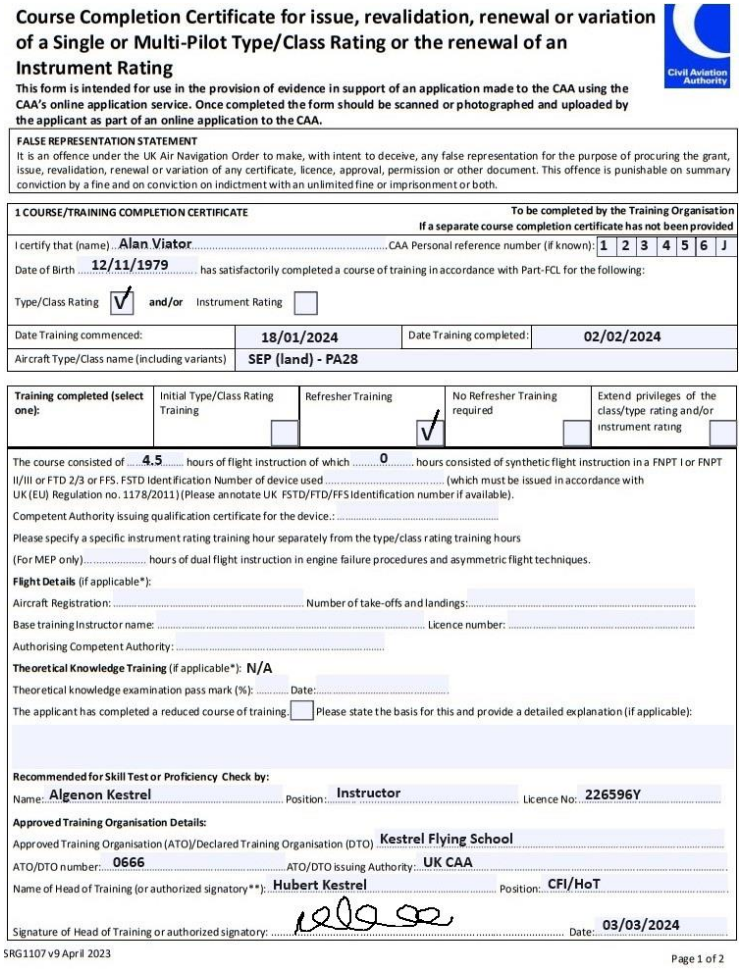
Extra CRI Lesson – Your Student's Pre-Test Paperwork

Practical Considerations

As a CRI, it is a very important part of your student's training, that you ensure his paperwork is ready for the examiner. Few examiners have the patience to wait while badly completed forms are filled out or corrected.

The Course Completion Certificate

The examiner will need to see a correctly completed and signed course completion certificate. For class ratings, form **SRG 1107** is used. This form is shown on the next page. The form must be signed by the CFI or Head of training of the ATO or DTO. Note, only Page 1 of this 2 page form is required.



Course Completion Certificate for issue, revalidation, renewal or variation of a Single or Multi-Pilot Type/Class Rating or the renewal of an Instrument Rating

Civil Aviation Authority

This form is intended for use in the provision of evidence in support of an application made to the CAA using the CAA's online application service. Once completed the form should be scanned or photographed and uploaded by the applicant as part of an online application to the CAA.

FALSE REPRESENTATION STATEMENT
It is an offence under the UK Air Navigation Order to make, with intent to deceive, any false representation for the purpose of procuring the grant, issue, revalidation, renewal or variation of any certificate, licence, approval, permission or other document. This offence is punishable on summary conviction by a fine and on conviction on indictment with an unlimited fine or imprisonment or both.

1 COURSE/TRAINING COMPLETION CERTIFICATE — **To be completed by the Training Organisation If a separate course completion certificate has not been provided**

I certify that (name) Alan Viator CAA Personal reference number (if known): 1 2 3 4 5 6 J

Date of Birth 12/11/1979 has satisfactorily completed a course of training in accordance with Part-FCL for the following:

Type/Class Rating [✓] **and/or** Instrument Rating [ ]

Date Training commenced:	18/01/2024	Date Training completed:	02/02/2024
Aircraft Type/Class name (including variants)	SEP (land) - PA28		

Training completed (select one):	Initial Type/Class Rating Training	Refresher Training	No Refresher Training required	Extend privileges of the class/type rating and/or instrument rating
	[ ]	[✓]	[ ]	[ ]

The course consisted of 4.5 hours of flight instruction of which 0 hours consisted of synthetic flight instruction in a FNPT I or FNPT II/III or FTD 2/3 or FFS. FSTD Identification Number of device used ..... (which must be issued in accordance with UK (EU) Regulation no. 1178/2011) (Please annotate UK FSTD/FTD/FFS Identification number if available).

Competent Authority issuing qualification certificate for the device.: .....

Please specify a specific instrument rating training hour separately from the type/class rating training hours

(For MEP only)..... hours of dual flight instruction in engine failure procedures and asymmetric flight techniques.

Flight Details (if applicable*):

Aircraft Registration: ..... Number of take-offs and landings: .....

Base training Instructor name: ..... Licence number: .....

Authorising Competent Authority: .....

Theoretical Knowledge Training (if applicable*): N/A

Theoretical knowledge examination pass mark (%): ..... Date: .....

The applicant has completed a reduced course of training. [ ] Please state the basis for this and provide a detailed explanation (if applicable):

Recommended for Skill Test or Proficiency Check by:

Name: Algenon Kestrel Position: Instructor Licence No: 226596Y

Approved Training Organisation Details:

Approved Training Organisation (ATO)/Declared Training Organisation (DTO) Kestrel Flying School

ATO/DTO number: 0666 ATO/DTO issuing Authority: UK CAA

Name of Head of Training (or authorized signatory**): Hubert Kestrel Position: CFI/HoT

Signature of Head of Training or authorized signatory: ..... Date: 03/03/2024

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If an ATO or DTO was not needed (as the rating had expired by less than 3 years) then a private Course completion certificate may be issued by the instructor.

An example of a private CCC is shown below:

Course Completion Certificate

1. COURSE/TRAINING COMPLETION CERTIFICATE

I certify that (name) .....

CAA Personal reference number (if known): ☐☐☐☐☐☐☐ Date of Birth: .....

has satisfactorily completed a course of training for the following:

Initial Type/Class Rating ☐ Refresher Training ☐ No Refresher Training Required ☐

Aircraft Type/Class, including variants: .....

Date Training commenced: ..... Date Training completed: .....

Training Content: The course consisted of ..... hours of flight instruction

Flight Details (if applicable*):

Aircraft Registration: ..... Number of take-offs and landings: .....

Theoretical Knowledge Training (if applicable):

Theoretical knowledge examination pass mark (%): ..... Date: .....

Recommended for Skills Test or Proficiency Check by:

Name: ..... Position: ..... Licence No.: ☐☐☐☐☐☐☐

Signature of authorised signatory: ..... Date: .....

Section – 4: THE CRI (SE) Assessment of Competence (AoC)

On satisfactory completion of the CRI course, the applicant shall demonstrate, to a CAA FIE, the ability to instruct a student pilot to the level required, including pre-flight, post-flight and theoretical knowledge instruction as laid out in **Standards Document 10**.

The CRI assessment of competence is divided into 4 main sections as follows:

Section 1: Theoretical Knowledge
Section 2: Pre-Flight Briefing
Section 3 & 4: Flight (Main & Supplementary exercises)
Section 7: Post-Flight Debriefing.

1. The AoC comprises oral theoretical examinations on the ground, pre-flight and post-flight briefings and in-flight demonstrations.

2. An applicant shall have received instruction on the same class of aeroplane used for the test.

3. Before taking the AoC, an applicant shall have completed the required training. The ATO shall produce the applicant's records when required.

4. Test Section 1: The oral theoretical knowledge examination part of the skill test, is sub-divided into 2 parts: The lecture and oral questioning.

5. Test Sections 2, 3 & 7 are for the FI(A) rating for single-engine (SE) single-pilot aeroplanes (SPAs). These sections comprise exercises to demonstrate the ability to be a CRI, (ie instructor demonstration exercises) chosen by the examiner from the flight syllabus of the CRI training course. The applicant will be required to demonstrate CRI abilities, including briefing, flight instruction and debriefing.

6. Test Section 4 is intentionally left blank and may be used for inclusion of other CRI demonstration exercises, as decided by the examiner and acknowledged by the applicant before the AoC.

7. During the AoC the applicant will occupy the seat normally occupied by the CRI, ie the RHS. The examiner will act as the 'student' in the LHS. The applicant will be required to explain the relevant exercises and to demonstrate them to the 'student'. Thereafter, the 'student' will execute the same manoeuvres including typical mistakes of inexperienced students. The applicant is expected to correct mistakes orally and or, if necessary, by intervening.

8. Test Sections 1 & 2 through 7 (as relevant) must be completed within a period of 6 months but all sections should, wherever possible, be completed on the same day. Failure in any exercise within Sections 2,3 and 4 (if applicable) and 5/6 (if relevant) requires a re-test covering all exercises. Section 1 (Theoretical Knowledge), if failed, may be taken separately.

9. The examiner may terminate the test at any stage if it is considered that the applicant's demonstration of flying or instructional skills require a re-test.

10. The examiner will normally be the pilot-in-command, (PIC) except in circumstances agreed by the examiner when another FI(A) is designated as PIC for the flight. Responsibility for the flight shall be allocated in accordance with national regulations.

The typical sequence in which the assessment will normally be conducted (with approximate durations for an initial issue) are:

(a) Administration and examiner's brief - 30 minutes
(b) Pre-Flight Briefing by instructor (Section 2) - 30 minutes
(c) Flight (Section 3 and additional exercises as required) – 60-90 minutes
(d) Post-Flight Debrief by applicant (Section 5) - 10 minutes
(e) Lunch
(f) Long briefing and theoretical knowledge (Section 1) - 2 hours
(g) Result, Examiners debrief and administration - 30 minutes

The examiner will explain and ascertain the instructor's understanding of the following definitions to be used throughout the assessment:
Demonstrate: If asked to 'demonstrate' an exercise or manoeuvre the instructor is expected to fly the complete exercise as a pure demonstration of piloting skill.
Patter: If asked to 'patter' an exercise or manoeuvre the instructor is expected to commentate whilst flying the manoeuvre, bringing out and highlighting any relevant teaching points. He is not required to break the exercise down into a lesson or offer the student control to practise.
Teach: If asked to 'teach' an exercise or manoeuvre the instructor is expected to break down the manoeuvre into its relevant parts and devise a lesson, giving the student time to practise and noting or correcting any faults or errors of technique.

Section 1 - Theoretical Knowledge Oral Subjects

a. Air Law
b. Aircraft General Knowledge
c. Flight Performance and Planning
d. Human Performance and Limitations
e. Meteorology
f. Navigation
g. Operational Procedures
h. Principles of Flight
i. Training Administration

Section 2 - Pre-Fight Briefing

a. Visual Presentation
b. Technical Accuracy
c. Clarity of Explanation
d. Clarity of Speech
e. Instructional Technique
f. Use of Visual Aids
g. Student Participation

Section 3 - Flight

a. Arrangement of Demo
b. Synchronisation of Speech with Demo
c. Correction of Faults
d. Aeroplane Handling
e. Instructional Technique
f. General Airmanship/Safety
g. Positioning Use of Airspace

Section 4 - Other Exercises As determined by the examiner

Section 7 - Post-Flight De-briefing

a. Visual Presentation
b. Technical Accuracy
c. Clarity of Explanation
d. Clarity of Speech
e. Instructional Techniques
f. Use of Models and Aids
g. Student Participation

Recommended Reading for CRI Course

Standards Document 10 – Guide forInstructors AoC
Standards Document 14 – Single Engine Pilots & Examiners
SRG 1157 – Examiner's Report for Class Rating
On-line form **SRG 3108** – Application for Issue, Renewal & Revalidation of Class Rating
SRG 1169 – Instructor Assessment of Competence Examiner's Report
Flight Examiner's Handbook
CAP 804 – For Reference only

Part 3: Pilot Licences

The UK.Part FCL PPL
The LAPL (A)
The UK NPPL
The UK Non-Part.FCL PPL

The UK Part.FCL PPL

Pre-Entry Requirements

There are no pre-entry requirements for a PPL course.

Flight Training:

The EASA PPL course consists of a minimum of 45 hours flight training (technically 5 hours of this may be completed in an approved simulator). All training must be carried out at an ATO or DTO by suitably qualified instructors. For further details see the relevant course in the next section.

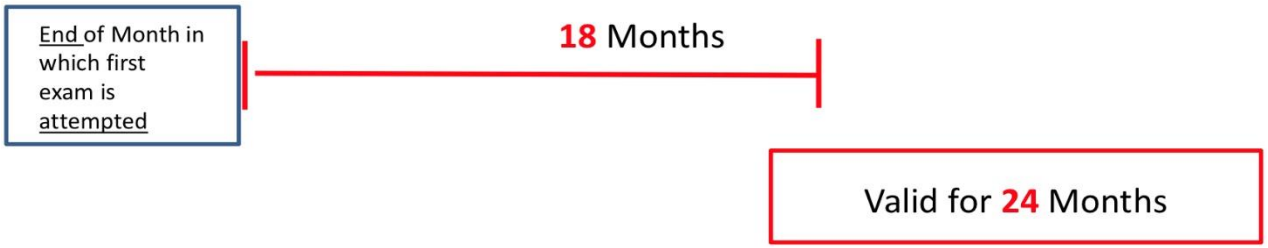
Ground Training:

Sufficient ground school is required to allow the applicant to pass 9 multiple choice on-line exams. These must be passed with a pass mark of 75% on the following subjects:

Common Subjects: Air Law, Human Performance, Meteorology, Communications, Navigation.

Specific Class Subjects: Principles of Flight, Operational Procedures, Flight Performance & Planning, Aircraft General Knowledge.

The exams must all be passed within 18 months of the end of the month in which the applican took the first exam. From the date of successful completion of these exams, the 'pass' remains valid for a further 24 months.



3 attempts at each exam are allowed. Failure of all 3 require the 4th attempt to be booked via the CAA and taken at Gatwick. Failure of the 4th attempt means a 3 month ban on further exams, all previous passes being rendered null and void, and all further exams must be taken at the CAA in Gatwick after further training has been carried out.

A FRTOL (Flight radiotelephony Operator's Licence) Practical Test must be passed for which a minimum demostrated language proficiency of 4 must be achieved. For further details see the relevant course in the next section.

Assessment:

A skill test with an UK Flight Examiner (FE) must be passed once all these requirements have been met. The examiner must not have completed more than 25% of the applicant's required flight training, nor should they have been involved in the final part of the applicant's training. If the skill test is carried out at an unlicenced aerodrome, the aerodrome operator and the examiner must both be satisfied that the aerodrome has adequate facilities for the safe conduct of flight.

The examiner must either be notified to the CAA by the ATO/DTO by means of an approved list of examiners, or if it is conducted externally, the examiner must apply to the CAA for authorisation to conduct the test. This is done by sending an e-mail to **testnotifications@caa.co.uk**. The test may not be conducted until authorisation has been received. The content of the e-mail is very specific, and failure to adhere correctly to the format may result in no response.

The subject field of the e-mail MUST be as follows: ST (skill test) Examiner Family Name Examiner Licence/Certificate No, for example:

ST SMITH GBR.FCL.123456A.A

The body of the e-mail MUST be as follows: Details of Applicant (Surname, Forenames, Title, Licence/CAA Ref No), Examiner details (Surname, Forenames, Title, UK Licence No, Examiner priveleges to be exercised during test), Test details (Type of test eg PPL ST, Class or type of a/c, Registration, Date of test, Venue of test, Time of test in 24 hour format) for example:

Details of Applicant: Johnson, Michael Peter, Mr, CAA Ref 456789Z.
Examiner Details: Smith, John Samuel, Mr, GBR.FCL.123456A.A, PPL skill test
Test Details: PPL ST, SEP(land)-PA28, G-ABCD, 14/02/2021, Blackbushe (EGLK), 1200.

For further information dee CAA Information Notice No 2016/0004.

Validity:

The PPL(A) is a non-expiring 'lifetime' licence. Once issued the licence is held unless it is provisionally suspended, suspended or revoked by the issuing authority or is surrendered by the holder. However, for the licence to be valid for any particular flight the medical certificate and relevant aircraft ratings contained within it must be valid.

Privileges:

General:

(a) The privileges of the holder of a PPL(A) are to act without remuneration as PIC or co-pilot on aeroplanes or TMGs engaged in non-commercial operations.

(b) Notwithstanding the paragraph above, the holder of a PPL(A) with instructor or examiner privileges may receive remuneration for:

(i) the provision of flight instruction for the LAPL(A) or PPL(A).

(ii) the conduct of skill tests and proficiency checks for these licences.

(iii) the ratings and certificates attached to these licences.

(c) May fly an aeroplane for the purpose of aerial work which consists of:

(i) towing a glider in flight

(ii) a flight for the purpose of dropping of persons by parachute

In either case the PPL(A) holder, aeroplane and persons carried in the aeroplane or glider are members of a flying club.

Note: The EASA PPL contains no requirement for night flying, and the resulting PPL confers no night privileges. A separate Night Rating must be obtained.

Carriage of Passengers:

A pilot shall not operate an aircraft carrying passengers:

(a) as PIC or co-pilot unless he/she has carried out, in the preceding 90 days, at least 3 take-offs, approaches and landings in an aircraft of the same type or class or an FFS representing that type or class.

(b) as PIC at night unless he/she:

(i) has carried out in the preceding 90 days at least 1 take-off, approach and landing at night as a pilot flying in an aircraft of the same type or class or an FFS representing that type or class.

OR

(ii) holds an IR.

Weather Minima:

Holders of a PPL without IR or IMC Rating are restricted to flight under Visual Flight Rules (VFR) 1.5 km visibility outside controlled airspace or 5 km visibility in Class C, D and E airspace.

The UK LAPL (A)

Pre-Entry Requirements

There are no pre-entry requirements for a LAPL, however, applicants for a LAPL(A) shall be at least 17 years of age. A student pilot for a LAPL(A) shall be at least 16 years of age before first solo flight.

Flight Training:

Applicants for a LAPL(A) shall complete a training course at a DTO or ATO. The course shall include flight instruction. The LAPL course consists of a minimum of 30 hours flight training For further details see the relevant course in the next section.

Ground Training:

Applicants for a LAPL(A) shall complete a training course at a DTO or ATO. The course shall include theoretical knowledge instruction. For further details see the relevant course in the next section.

Assessment:

A skill test with an Flight Examiner (FE) must be passed once all these requirements have been met.

Validity:

The Light Aircraft Pilot's Licence (LAPL) Aeroplanes is a non-expiring 'lifetime' licence. Once issued the licence is held unless it is provisionally suspended, suspended or revoked by the issuing authority or is surrendered by the holder.

A LAPL(A) gained at a UK DTO or UK ATO is now (as of 01 Jan 2021) only valid in the UK FIR with restrictions on aeroplane weight (MTOW of 2000 kg or less) and with no more than 4 people on board the aircraft (including crew and passengers).

Privileges:

General:

The LAPL(A) is different to other licence types in that it does not contain aircraft type or class ratings with expiry dates that need revalidation. They include privileges built into the licence itself, so a LAPL(A) will not have an SEP (land) rating with expiry date, but it will have stated SEP or TMG privileges which the pilot must keep valid by ensuring at least a certain minimum amount of flying is maintained. A LAPL(A) can however contain other (non-aircraft) ratings e.g. night, or aerobatics.

The privileges of the holder of a LAPL for aeroplanes is to act as PIC on single-engine piston aeroplanes-land (SEP (land)), single-engine piston aeroplanes-sea (SEP (sea)) or TMG with a MTOW of 2000 kg or less, carrying a maximum of 3 passengers, such that there are always a maximum of 4 persons on board of the aircraft.
The LAPL(A) holder may fully exercise the privileges within the UK FIR only since the UK left EASA. The LAPL(A) does not fully comply with the ICAO standards for aeroplane pilot licensing contained in the ICAO Annex 1 'Personnel Licensing'.

Extension of Privileges to another Class or Variant of aeroplane

(a) The privileges of an LAPL(A) shall be limited to the class and variant of aeroplanes (SEP land, SEP sea or TMG) in which the skill test was taken. This limitation may be removed when the pilot has completed, in another class, the requirements below:

(1) 3 hours of flight instruction, including: (i) 10 dual take-offs and landings. (ii) 10 supervised solo take-offs and landings

(2) a skill test to demonstrate an adequate level of practical skill in the new class. During this skill test, the applicant shall also demonstrate to the examiner an adequate level of theoretical knowledge for the other class in the following subjects:

(i) Operational procedures, (ii) Flight performance and planning, (iii) Aircraft general knowledge.

(b) In order to extend the privileges to another variant within a class, the pilot shall either undertake differences training or do a familiarisation. The differences training shall be entered in the pilot's logbook or into an equivalent record and be signed by the instructor.

Recency:

(a) Holders of a LAPL(A) shall exercise the privileges of their licence only if in the last 2 years they have met any of the following conditions as pilots of SEP aeroplanes or TMGs:

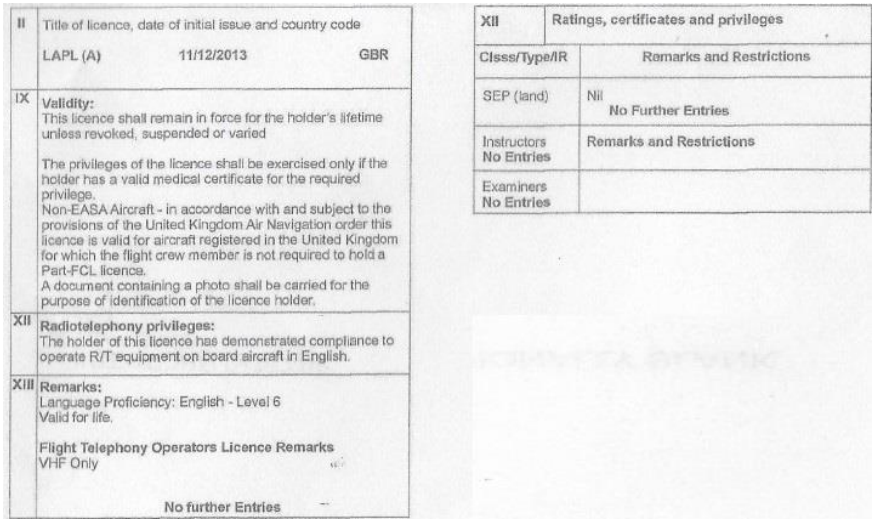
(1) they have completed at least 12 hours of flight time as PIC or flying dual or solo under the supervision of an instructor, including:

- 12 take-offs and landings.
- refresher training of at least 1 hour of total flight time with an instructor. (These 2 together are known as 'Rolling Requirement')

or

(2) they have passed a LAPL(A) proficiency check with an examiner. The proficiency check shall be based on the skill test for the LAPL(A).

(b) If holders of a LAPL(A) hold both a SEP(land) and a SEP(sea) privilege, they may comply with the requirements in point (a)(1) in either class or a combination thereof which shall be valid for both privileges. For this purpose, at least 1 hour of the required flight time and 6 out of the required 12 take-offs and landings shall be completed in each class.



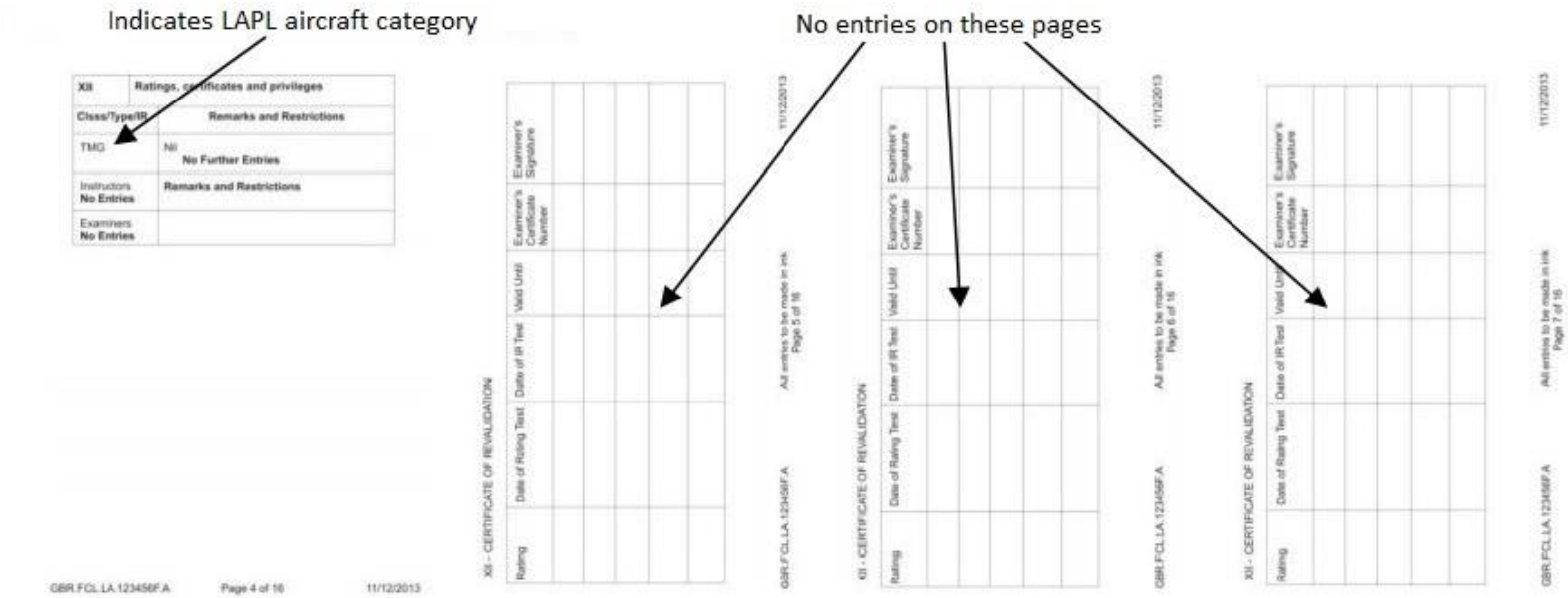
II	Title of licence, date of initial issue and country code
	LAPL (A) 11/12/2013 GBR
IX	**Validity:** This licence shall remain in force for the holder's lifetime unless revoked, suspended or varied The privileges of the licence shall be exercised only if the holder has a valid medical certificate for the required privilege. Non-EASA Aircraft - in accordance with and subject to the provisions of the United Kingdom Air Navigation order this licence is valid for aircraft registered in the United Kingdom for which the flight crew member is not required to hold a Part-FCL licence. A document containing a photo shall be carried for the purpose of identification of the licence holder.
XII	**Radiotelephony privileges:** The holder of this licence has demonstrated compliance to operate R/T equipment on board aircraft in English.
XIII	**Remarks:** Language Proficiency: English - Level 6 Valid for life. **Flight Telephony Operators Licence Remarks** VHF Only **No further Entries**

XII	Ratings, certificates and privileges
Class/Type/IR	Remarks and Restrictions
SEP (land)	Nil No Further Entries
Instructors No Entries	Remarks and Restrictions
Examiners No Entries	

NOTE: The LAPL is not like any other licence because it does not contain ratings that need to be revalidated or renewed. The LAPL itself is both the rating and the licence. Pilots do not revalidate or renew a LAPL, its validity is maintained by recency requirements.

Q: So why is there a rating indicated in Section XII of the licence?

A: This is the UK CAA way of indicating the LAPL aircraft category e.g. SEP (Land), TMG, etc. Unlike other licences it does not mean there should be a signature in Section XII (Certificate of Revalidation) in order to maintain validity. This is done through recency using logbook evidence prior to each and every flight. It is the pilot's responsibility to ensure the recency is met prior to each and every flight.



Q: Should there be a signature on my licence in Section XII Certificate of Revalidation?

A: No there should not be any entry or signature in Section XII Certificate of Revalidation. If there is it is incorrect and could lead to issues with the National Aviation Authority (UK CAA) should your licence be inspected by them.

Q: I already have an entry in Section XII Certification of Revalidation. What should I do?

A: Ignore the entry and the date. It has no relevance to a LAPL. Do not cross it out as this action could be interpreted as defacing the licence. Check the recency requirements for your LAPL in accordance with Part FCL and then follow these recency requirements. If you are still unsure please get in touch with a suitable training organisation for further guidance.

Q: If I have to pass a Proficiency Check in order to regain recency where does the examiner sign?

A: The examiner shall make an entry in your pilot logbook only. The examiner shall not make any entries in the licence.

Suggested entry in pilot logbook:

Passed Proficiency Check in accordance with FCL.140

GBR.123456F

- Holders of a LAPL(A) shall exercise the privileges of their licence only if in the last 2 years they have met any of the following conditions as pilots of Aeroplanes or TMGs:

Rolling Requirement
or
LAPL Proficiency Check with an Examiner

Carriage of Passengers:

A LAPL(A) holder may carry no more than 4 people on board the aircraft (including crew and passengers).

Holders of a LAPL(A) shall carry passengers only if they have completed 10 hours of flight time as PIC on aeroplanes or TMG after the issuance of the licence.
Holders of a LAPL(A) who previously held an ATPL(A), an MPL(A), a CPL(A) or a PPL(A), are exempted from the passenger carrying requirements above.

A pilot shall not operate an aircraft carrying passengers:
(a) as PIC or co-pilot unless he/she has carried out, in the preceding 90 days, at least 3 take-offs, approaches and landings in an aircraft of the same type or class or an FFS representing that type or class
(b) as PIC at night unless he/she has carried out in the preceding 90 days at least 1 take-off, approach and landing at night as a pilot flying in an aircraft of the same type or class or an FFS representing that type or class.

Weather Minima:

Holders of a LAPL are restricted to flight under Visual Flight Rules (VFR) 1.5 km visibility outside controlled airspace or 5 km visibility in Class C, D and E airspace.

Upgrade LAPL to PPL

If you hold a LAPL (A) and are applying for a PPL (A) you must complete the following:

- At least 15 hours of flight time on aeroplanes after the issue of the LAPL (A), of which at least 10 hours should be flight instruction at an ATO. This flight instruction must include 4 hours of supervised solo flight, of which at least 2 hours must be solo cross country, with at least 1 cross country flight of 270km (150NM) or more, plus full stop landings at 2 aerodromes different from the departure aerodrome.
- Pass the PPL Skill test.

The UK National Pilot's Licence (NPPL)

General:

The National Private Pilot's Licence (NPPL) is a UK specific pilot's licence developed in 2002. It is not an internationally recognised licence and does not automatically entitle the holder to fly aircraft in other countries. The NPPL may include in it aircraft Class Ratings that allow the holder to fly specific classes of aircraft e.g. microlights, SLMG, etc.

The NPPL is available for microlights and other non-EASA aircraft:

- Vintage aircraft
- Permit-to-fly aircraft
- Kit-built aircraft

The NPPL can only be used on UK-registered aircraft inside UK airspace, unless you have an agreement with the aviation authorities in another country which will allow you to fly in that country's airspace.

You can add class ratings to the NPPL to allow you to fly microlights, self-launching motorgliders (SLMGs) and simple single-engine aeroplanes (SSEAs):

- You can apply for class ratings for SLMGs and SSEAs through the Light Aircraft Association (LAA)
- Applications for microlight class ratings can be made through the British Microlight Aircraft Association (BMAA)

The NPPL does not require a language proficiency test, however, to operate radio telephony equipment you must hold a Flight Radio Telephony Operators Licence (FRTOL).

To enable you to fly EASA certified aircraft (eg PA28, Cessna 172), you will need to convert to a minimum of Part FCL LAPL (A). Additionally you will need to meet the medical and recency requirements for the LAPL(A).

To take advantage of conversion to a LAPL(A), the NPPL SSEA or SLMG must have been issued by the UK CAA on or before 7 April 2018. It is not possible to convert a microlight class rating, as there is no EASA equivalent.

Holders of UK licences higher than an NPPL may apply for an NPPL by submitting the application form and paying the fee.

Pre-Entry Requirements

Minimum Age: First solo is 16 years, Issue of an NPPL is 17 years.
Medical Requirements: A certificate of fitness from a GP, equivalent to the DVLA Group 2 professional driving medical standards, is required for solo flying or for passenger carrying. It may be possible for individuals who cannot meet the DVLA Group 2 standards to operate as a solo pilot only with a certificate of fitness equivalent to the DVLA Group 1 standards.

Flight Training:

Training Aircraft: Adequately equipped and maintained aircraft shall be used for training. See specific syllabus requirements.
Training Airfields: Training for the NPPL shall be conducted at suitable airfields. See specific syllabus requirements
Instruction: Instruction for the NPPL must be carried out by a holder of an appropriate flight instructor certificate. There are no special NPPL instructors and an FI with an SEP rating can do the training towards the issue of an NPPL with SSEA.

Ab-initio students should complete flight training in accordance with the specific class rating syllabus requirements. The flight training hours are:

Microlight:	**Simple Single Engine Aeroplane (SSEA):**	**Self Launching Motor Glider (SLMG):**
Minimum dual 25 hours, of which: Minimum solo 10 hours Minimum dual navigation 5 hours Minimum solo navigation 3 hours **Total 25 hours**	Min 22 hrs dual to include 1 hr instrument appreciation Minimum solo 10 hours Minimum solo navigation 4 hrs to include a nav flight of at least 185 km (100 nm) with full stop landings at 2 aerodromes other than that of departure. **Total 32 hours**	Minimum dual 22 hours Minimum solo 10 hours to include a solo nav flight of a defined distance that involves landing at other airfields. **Total 32 hours.**

Ground Training:

Theoretical Knowledge Examinations: Applicants for the NPPL must pass the theoretical knowledge examinations in accordance with the specific class rating syllabus requirements. The subjects examined include:
Air Law, Aeroplane General Knowledge, Airframes, Engines and Instruments, Flight performance and Planning, Human Performance & Limitations, Fire, First Aid and Safety Equipment, Meteorology, Navigation, Operational Procedures, Principles of Flight & Communications.

Assessment:

2 Skill tests must be undertaken:

- **Navigation Skill Test:** Applicants for the NPPL will be required to pass a Navigation Skill Test with an examiner prior to undertaking the qualifying solo cross-country flight.
- **General Skill Test:** Applicants for the NPPL will be required to pass a General Skill Test with an examiner on completion of all the training

Medical:

The holder of an NPPL may make a Pilot Medical Declaration (PMD). It is a free service available via the CAA Customer Portal, and it is no longer possible to use an Avoka form for medical self-declaration. The Pilot Medical Declaration is available **here**.

Validity:

The NPPL remains valid for the lifetime of the holder. Each of the 3 class ratings has a validity period of 2 years.

Revalidation of Class Rating:

Within the validity period of the class rating, a total of at least 12 hours flight time including 8 hours as PIC must be completed in order to revalidate by experience.

- **Holder of a licence with one class rating (SSEA or SLMG or Microlight):**

Complete on the class of aeroplanes held:

(a) within the period of validity of the rating have flown as pilot:

(i) at least 12 hours flight time including 8 hours PIC

(ii) at least 12 take-offs and landings.

(iii) at least 1 hour of flight training with an instructor. If this flight time has not been completed, the rating will be endorsed 'Single seat only'

(b) Within the 12 months preceding the expiry date of the rating, have flown as pilot:

(i) at least 6 hours flight time.

- **Holder of a licence with 2 or 3 ratings (SSEA/SLMG/Microlight):**

(a) Within the period of validity of the rating on any of the classes of aeroplanes held, have flown as pilot:

(i) at least a total of 12 hours including 8 hours PIC

(ii) at least 12 take-offs and landings

(iii) at least 1 hour of flight training with an instructor. If this flight time has not been completed all ratings will be endorsed 'Single seat only'

(b) Within the 12 months preceding the expiry date of the ratings held have flown, as pilot on any of the class ratings held:

(i) at least 6 hours flight time

(c) Within the period of validity of each class rating held, have flown as pilot:

(i) at least 1 hour PIC on each class held **OR**

(ii) undertaken at least 1 hour of flying training on each class held with an instructor entitled to give instruction on aeroplanes of those classes

If (c) has not been fully completed, you will be required to renew the relevant class rating(s) by GST.

Renewal of a Class Rating:
If a class rating has expired it shall be renewed by passing a GST with an examiner.

Privileges:

General:
To fly aircraft up to a maximum mass of 2000kg.

Carriage of Passengers:
A maximum of 3 passengers may be carried.

Weather Minima:
Day only, UK only, VFR only.

Upgrade to LAPL
You can convert a NPPL which was issued before 8th April 2018 directly to an UK PART-FCL LAPL (A) by submitting an application to the UK CAA using form **SRG 1104**.
An NPPL issued after 08Apr18 cannot be directly upgraded. It may be possible to use some of the experience gained towards the minimum hours requirements. Then the following minimum training is required: 15 hours dual training, 6 hours supervised solo including the solo cross country and pass the LAPL skill test with an examiner.
Other hours may be credited towards a LAPL, except that the credit must not exceed the total PIC time that has been accrued. Full details of agreed conversion requirements are contained in CAP 804, Section 4, Part P.

Upgrade to PPL
In order to convert to a PPL further training is required.

The UK ICAO-Compliant Non Part.FCL PPL

General:

The UK Non Part FCL licence is issued subject to the rules and regulations of the ANO 2016. It can be issued alongside a UK Part-FCL licence, but only is requested.

Privileges:

Holders of UK National Licences may no longer fly as Pilot in Command in a UK (G) registered Part 21 aeroplane (formerly called EASA aeroplanes).

The holder of this licence can fly UK (G) registered non-Part 21 aeroplanes and conduct aerobatics without holding an Aerobatic Rating. The DHC 1 Chipmunk is an example of a non-Part 21 aeroplane.

The ANO 2016 requires the holder of a UK National Licence with a valid Single Engine Piston (SEP) Class Rating to complete differences training with an appropriately qualified Instructor prior to flying as pilot in command of a microlight aeroplane. This includes three axis microlights as well as weightshift microlights.

Part 4: Student Ratings & Courses

PPL Course Lessons

The PPL course consists of a sequence of numbered lessons as follows:

Ex 1 -	**Familiarisation and Emergency Procedures**
Ex 2 -	**Preparation before and Action after Flight**
Ex 3 -	**Familiarisation/Air Experience**
Ex 4 -	**Effects of Controls:** Further divided into **Ex 4.1** & **Ex 4.2**
Ex 5 -	**Taxiing**
Ex 6 -	**Straight and Level:** Further divided into **Ex 6.1** & **Ex 6.2**
Ex 7 -	**Climbing** – Often combined with Ex 8 and further divided into **Ex7.1** & **Ex 8.1** and **Ex7.2** & **Ex 8.2**
Ex 8 -	**Descending** – Often combined with Ex 7 and further divided into **Ex7.1** & **Ex 8.1** and **Ex7.2** & **Ex 8.2**
Ex 9 -	**Turning** – Often separated into **9.1: Level Turning** & **9.2: Climbing & Descending Turns**
Ex 10 -	Usually split into **Ex10A - Slow Flight** & **Ex 10bi , Ex 10bii** & **10biii** (Stalling).
Ex 11 -	**Spinning & Spin Avoidance**
Ex 12 -	**Takeoff & Climb**
Ex 13 -	**Circuit, Approach & Landing**
Ex 14 -	**Solo Circuits (First Solo)**
Ex 15 -	**Advanced Turns (Steep Turns)**
Ex 16 -	**Forced Landing without Power**
Ex 17 -	**Precautionary Landings with Power**
Ex 18	**Ex 18A - Basic Navigation, Ex 18B - Low Level Navigation, Ex 18C - Radio Navigation**
Ex 19 -	**Introduction to Instrument Flight**

The briefs that follow in this document are based on the flying characteristics, systems and speeds of the Cessna 152. They should be modified if other aircraft types are used.

As a CRI will not be involved in ab-initio pilot training, exercises 1-9 are not covered in this section.

Ex 10a - Slow Flight & Ex 10b (i), (ii) & (iii) – Stalling

Practical Considerations

- Exercise 10 deals with all aspects of flight at critically low airspeed. Ex10a deals with general handling at speeds just above the stall warner. Ex10b(i) is concerned with symptoms of the clean stall and recovery. 10b(ii) deals with stalling with flap and in turns. Ex 10b(iii) deals with incipient and secondary stalls. This should never be completed in a single flight, as there is simply too much to cover and it is very important material. It is possible to combine a couple of exercises into one lesson, say 10b(ii) & 10b(iii).
- For the pre-flight briefing, make sure you have an aircraft model available and that you use it in the correct orientation relative to the student.

Ex 10a - Slow Flight

Practical Considerations

- Flying at such critically low airspeeds is of no practical benefit to the student. It provides no useful tool to take away as there are no circumstances in which it would be needed. It is also potentially dangerous. It also involves flying around with the stall warner sounding continuously which is negative training. Therefore it should be stressed to the student that this is purely for them to experience flight at low speed, so that if they ever encounter that in the future, they can recognise it for what it is and recover to normal flight. It has some minor benefit, as it requires accurate and co-ordinated flight from the student.
- Although many sources (including EASA AMC) quote 5 kts above the stall for slow flight, the PPL syllabus only states recognition and recovery from critically slow airspeed. The full brief is given below, but on a practical basis for the PPL syllabus, it will neither be taught in full or examined at all, except during approach to the stall.

Long Briefing

From EASA Part-FCL:

Long briefing objectives:

(1) aeroplane handling characteristics during slow flight at:

(i) Vs1 & Vso + 10 knots;

(ii) Vs1 & Vso + 5 knots.

(2) slow flight during instructor induced distractions;

(3) effect of overshooting in configurations where application of engine power causes a strong ‘nose-up’ trim change.

Board Briefing

Ex 10a: Slow Flight

03Jan23

AIM: To recognise when the aircraft is in slow flight. To learn how to handle the a/c in slow flight and how to return to normal S+L flight.
T&E: Other a/c, Engine overheat, Disorientation, Carb icing.
M: Lookout, FREDA Checks, Anchor Point, Carb Heat.

Airex: **1: Revision:** Climbing, S+L.

2: Straight + Level Flight

Entry to Slow Flight:
- Carb Heat ON
- Reduce Power 1700 rpm
- Adjust Att
- Maintain Altitude
- Reset Power to maintain (CH Off)

Note:
- High nose att - poor fwd visibility
- Low airspeed
- Sloppy controls
- Stall warner
- Rudder required

3: Straight + Level with Flap
- Select Flap (V_{fe})
- Allow att to stabilise
- Maintain altitude
- Adjust power

4: Turning
- Shallow Turns - 15° AoB
- May need extra power

5: Turning with flap
- Shallow Turns - 15° AoB
- Will need extra power

6: Climbing
- Full power needed
- Low rate of climb
- Very high nose att
- High rudder force

7: Climbing with flap
- As above
- Minimal rate of climb

8: Descending
- CH On - Reduce power
- Nose att higher than normal

9: Descending with flap
- Nose att higher than normal

10: Return to Normal S&L Flight
- Full Power
- Balance with Rudder
- Select Lower Nose Attitude
- As Speed Increases.....Reduce Power
- Trim

Skeleton Board Briefing

Ex 10a: Slow Flight

03Jan23

AIM: To recognise when the aircraft is in slow flight. To learn how to handle the a/c in slow flight and how to return to normal S+L flight.
T&E:
M:

Airex: 1: Revision:

2: Straight + Level Flight

3: Straight + Level with Flap

4: Turning

5: Turning with flap

6: Climbing

7: Climbing with flap

8: Descending

9: Descending with flap

10: Return to Normal S&L Flight

Air Exercise (Lesson Points correspond to the numbers in the Flight Prompt Cards)

On the Ground:	The student should now need no assistance or prompting to get the aircraft as far as lining up on the runway for your take-off.
Take-Off:	As before, carry out the take-off while the student observes. Use the checklist and ask the student to make the radio calls. Handover control shortly after take-off to allow revision of climbing.
Lesson Point 1:	**STUDENT PRACTICE** of climbing into the local area to a suitable altitude (say 3000'). Take control from the student when the aircraft is set up, trimmed in straight and level flight at the assigned altitude.
Lesson Point 2:	Ask the student to set the aircraft up in straight and level flight at 65 kts in a clean configuration. When satisfactory: 'I have control. Here we are in straight and level flight, trimmed at 65 kts. I am now going to reduce to 60 kts. Notice the higher nose attitude. Notice how much power is needed. Notice the poor forward visibility due to the high nose attitude. When I give you control, I want you to feel all the flight controls at this speed. You have control.' **STUDENT PRACTICE.**
Lesson Point 3:	Now take control and demonstrate the characteristics and dangers of slow flight. Avoid stall warner activation. 'I have control. Notice how strange the aircraft looks and feels at this speed. We have the high nose attitude and the sloppy controls. Look out of the side window and you will see how slowly we are moving relative to the ground. This is not a situation we would normally want to find ourselves in. It is important to be able to recognise slow flight in order to get out of it. I now want you to practice flying straight and level like this, but I want you to make very gentle inputs on the controls.'
Lesson Point 4:	'You have control.' **STUDENT PRACTICE** After satisfactory straight and level flight take back control. 'I have control.'
Lesson Point 5:	'Now I want you to follow me through on the controls as I demonstrate a left turn in slow flight. First a good lookout, then co-ordinated rudder with aileron as I roll to the left to 15 angle of bank. Notice the speed reducing, so I add a little more power to maintain 60 kts. As I roll out of the turn, rudder, and aileron together back to straight and level, and I can remove a little power.'
Lesson Point 6:	'Now I want you to practice gentle turns to the left and right at this speed. You have control.' **STUDENT PRACTICE.**
Lesson Point 7:	'Now I want you to follow me through on the controls as I demonstrate a climb in slow flight. First a good lookout, particularly above, then FULL POWER co-ordinated rudder and raise the nose slightly to maintain 60 kts. I am controlling the airspeed with elevator now. Notice the very high nose attitude. As I reach 3500' I will level out. First lower the nose, and as the speed increases, I can reduce the power a little, maintaining my altitude.'
Lesson Point 8:	'Now I want you to climb at 56 kts to 4000'. You have control.' **STUDENT PRACTICE.**

Lesson Point 9:	'Now I want you to follow me through on the controls as I demonstrate a descent in slow flight. First a good lookout, particularly below and to the sides, then Carb Heat ON, reduce power a little, co-ordinated rudder, and lower the nose slightly to maintain 60 kts. I am controlling the airspeed with elevator now. Notice the relatively high nose attitude. As I reach 3500' I will level out. First increase power, preventing yaw with the rudder, raise the nose slightly, and maintain my altitude.'
Lesson Point 10:	'Now I want you to descend at 60 kts to 3000'. You have control.' **STUDENT PRACTICE.**
Lesson Point 11:	Now is a really good time to repeat the demonstration of adverse yaw, as at these lower speeds it is more obvious. 'Now I want to show you how pronounced adverse yaw is at these speeds. Pick a feature in the distance if you can. Now, watch as I make a turn to the left.' Rotate the control column briskly to the left. 'Did you see the nose move to the right?' This is just a demonstration, and there is no need for the student to practice it.
Lesson Point 12:	Now we repeat the exercises with various flap settings to gain more practice in co-ordination. Some students may require a demonstration, others will be able to carry out the manoeuvres for themselves. 'Now I want you to select two stages of flap and fly straight and level at 55 kts. You have control' **STUDENT PRACTICE.** Now I want you to climb at 55 kts in this configuration. You have control' **STUDENT PRACTICE.** Now I want you to descend in this configuration at 55 kts. You have control' **STUDENT PRACTICE.**
Lesson Point 13:	Now there can be an optional demonstration of a stall. Many students can be anxious about stalling, so a demonstration of a full stall (held in for a short while) and recovery should help calm nerves.
Approach & Landing:	On the way back to the airfield, the student should be able to navigate and descend towards the airfield and onto final for landing with little or no assistance. 'Now it is time to return to the airfield. I would like you to fly me there using a cruise descent and make the radio calls for the rejoin.' **STUDENT PRACTICE** 'I would like you to set up the aircraft for the circuit and final approach.' Once on base leg. 'OK, I now want you fly me round the circuit and line up with the runway.' As long is the approach is reasonable, allow it to continue. Once it gets too divergent take over and continue to talk through your actions to touchdown.
After Landing, Shutdown & Post-flight:	As before, return control to the student after vacating and at a standstill.

Flight Prompt Card

Ex 10a: Slow Flight

AIREX:
1: REVISION: Student Climb out.
2: Ask student to set up S&L at 65 kts clean.
3: Take control. Reduce to 60 kts. Point out Sloppy Controls, High nose att. High Power Requirement. EMPHASIZE DANGER Show low GS, drift effects, possible stall warner.
4: STUDENT PRACTICE S & L at 60 kts.
5: DEMO/FT 15º bank turns to L & R.
6: STUDENT PRACTICE.
7: DEMO climb at 60kts.
8: STUDENT PRACTICE
9: DEMO descent at 60 kts.
10: STUDENT PRACTICE
11: DEMO adverse aileron yaw at low speed.
12: STUDENT PRACTICE 4-10 above at Flap 2, 55 kts.
13: Optional DEMO only of full stall (held in) and recovery)
14: Return for approach. STUDENT PRACTICE setting up approach.

Debriefing

- Emphasize that slow flight is not something we would choose to do for real (if we need to fly slowly in the circuit for spacing, Slow Safe Cruise is much more appropriate). It is only a training exercise to show them how the aircraft handles at critically low airspeed.

Common Student Faults

- Selecting the normal straight and level attitude when in slow flight, and thus descending. Reinforce the higher nose attitude.
- Insufficient rudder.
- Overbanking. Use a maximum of 15º.

Common Instructor Faults

- Do not allow the stall warner to sound too often. It will alarm the student and is negative training. Choose a slightly higher airspeed if needed.

Ex 10b(i) – Stalling 1

Practical Considerations

- Ideally, the student will have seen a DEMO only of a full stall and Standard Stall Recovery at the end of the last lesson, to prepare them for Ex10b(i). If this was not possible, then begin with a demonstration.
- Make sure there is a good horizon and plenty of vertical airspace available for this exercise. The instructor should maintain a careful watch on airspace, as it is easy to infringe vertically during these exercises.
- There are 3 lessons shown here – Ex10b(i), Ex10b(ii) & Ex10b(iii). The third exercise may be included with the others or used as a consolidation lesson.
- Many students are anxious about stalling, so a good idea is to make the first demo, just an approach to the stall, showing how to remove each symptom as it occurs. This way the student learns the power off recovery without realising, and is not frightened by a sudden wing drop at the start of the lesson.
- For the pre-flight briefing, make sure you have an aircraft model available and that you use it in the correct orientation relative to the student.

Long Briefing

From EASA Part-FCL:

Long briefing objectives:

(1) characteristics of the stall;
(2) angle of attack;
(3) effectiveness of the controls at the stall;
(4) factors affecting the stalling speed: (i) effect of flaps, slats and slots; (ii) effect of power, mass, CG and load factor.
(5) effects of unbalance at the stall;
(6) symptoms of the stall;
(7) stall recognition and recovery;
(8) stalling and recovery:
- (i) without power;
- (ii) with power on;
- (iii) with flaps down;
- (iv) maximum power climb (straight and turning flight to the point of stall with uncompensated yaw);
- (v) stalling and recovery during manoeuvres involving more than 1 G (accelerated stalls, including secondary stalls and recoveries);
- (vi) recovering from incipient stalls in the landing and other configurations and conditions;
- (vii) recovering at the incipient stage during change of configuration;
- (viii) stalling and recovery at the incipient stage with 'instructor induced' distractions.

Example Long Briefing

Stalling

AIM: To understand the aerodynamics of a stall and the factors which affect it.

Introduction

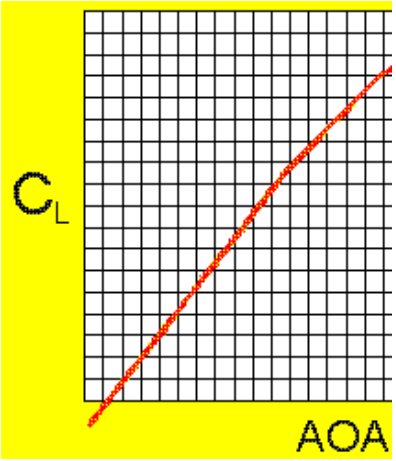
From our studies of lift, we remember that the lift generated by a wing is dependent on a number of variables, these being:

- **The cross-section shape of the aerofoil**
- **The angle of attack**
- **The area of the wing**
- **The density of the air**
- **The speed of flight through the air**

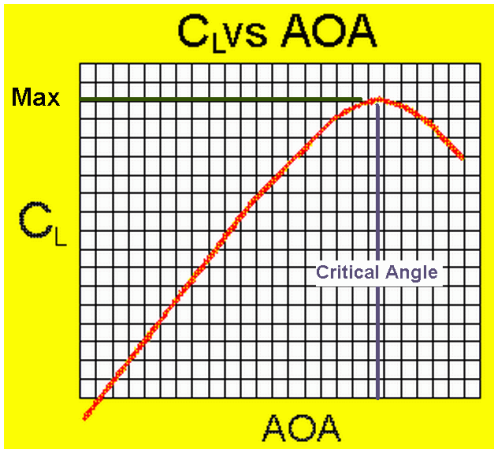
The **Coefficient of Lift** is a unit-less number which depends on both the cross-sectional shape of the aerofoil and on the angle of attack, and is an indication of the relative amount of lift being produced by a wing. This leads us to the formula for calculation of lift as shown:

$$L = C_L \times S \times \tfrac{1}{2}\rho V^2$$

The Coefficient of Lift CL **The air density ρ** **The True Airspeed v** **The area of the wing S**



In general, we find that as the angle of attack is increased, then so too is the co-efficient of lift, and so also the amount of lift produced.
However this is only true up to a point. We cannot go on increasing the angle of attack indefinitely and expect to achieve more and more lift. Eventually, there will come an angle of attack, beyond which, lift no longer increases, and in fact decreases sharply.
This angle of attack is known as the **critical or stalling angle of attack**. Once this angle is reached, the airflow over the wing ceases to be streamlined and becomes turbulent. This is known as the stall.
The wing will stall when the angle of attack reaches the critical or stalling angle

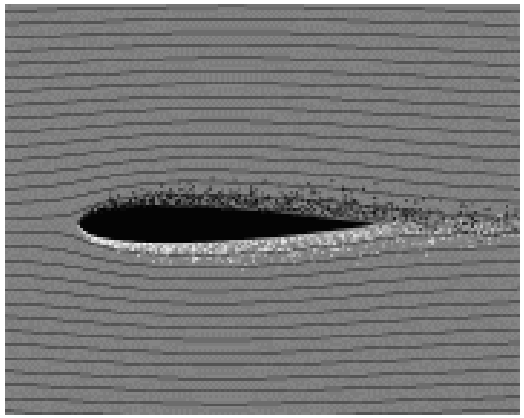


For most wings, the critical angle of attack is around 16 degrees. The airspeed for a stall is not a constant, however, varying with several factors as will be discussed later. When the wing reaches the critical angle it will stall.

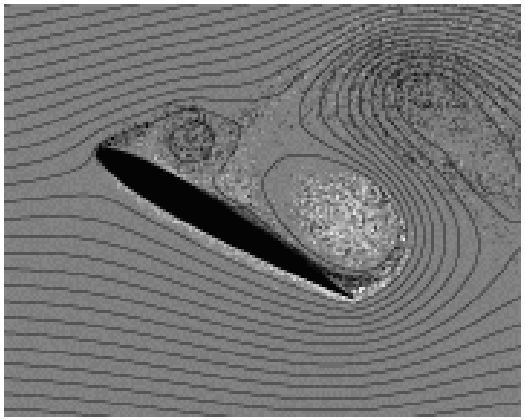
What happens at the stall?

When the angle of attack reaches the critical angle, several thing happen:

- **The airflow ceases to be streamlined and becomes turbulent**
- **The boundary layer separates**
- **The formation of low static pressure on upper wing surface is greatly reduced**
- **The Coefficient of lift sharply decreases**
- **The centre of pressure moves rearwards causing nose to pitch down**
- **Aerofoil drag increases rapidly**



Streamlined flow over non-stalled wing



Turbulent flow over stalled wing

In fact a wing has a maximum co-efficient of lift at the stall

Symptoms of the Stall

Symptoms of the approach to the stall are:

- **Low Airspeed**
- **High Nose Attitude**
- **Sloppy Controls**
- **Stall warning device**
- **Light Aerodynamic buffet**

Once the wing is actually stalled,

- **Rate of descent**
- **Nose often pitches down**
- **Heavy airframe buffet**
- **Possible wing drop**

Stall Speed

As we discovered before, the wing stalls when it reaches its critical angle of attack. However, in most aeroplanes we do not have a device to measure our angle of attack. We do know, however that angle of attack is related to indicated airspeed, and this we can easily measure. For this reason, we frequently talk about the stall speed of an aeroplane, although of course this speed can and does change, even for the same wing.

Factors Affecting Stall Speed

- **Mass**
- **Lift and Load factor**
- **Contamination**
- **Slipstream**
- **Wing Area**
- **Flaps**
- **Centre of Gravity**

We will now look at these factors in turn:

1. Mass

At the stall in level flight, Lift = Weight. Since **Lift = $CL\frac{1}{2}\rho v^2 S$** and CL and S are constants at the stall, then as weight/mass (or lift) increases, then so too must **$\frac{1}{2}\rho v^2$** proportional to IAS^2. Thus, if the airplane mass doubles, the stall speed will increase by the square root of two: 1.41.

Mass↑ Stall speed↑

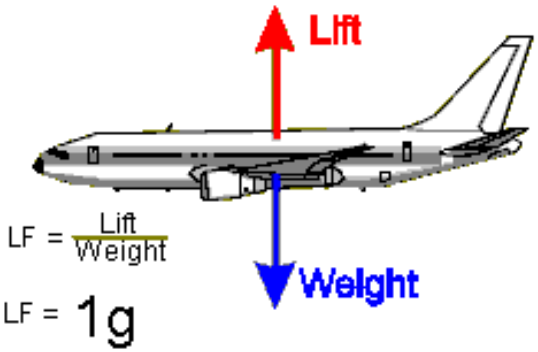
2. Lift & Load Factor

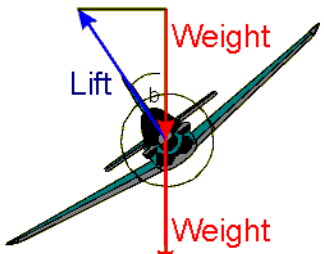
Since S is constant for our aerofoil and CL is constant at the stall, then the above formula simplifies **V** is proportional to **√LIFT**
So as the lift requirement increases, so too does the stalling speed.

Lift↑ Stall speed↑

Load Factor

Load factor is defined as the ratio of lift to weight, and is equivalent to the **g force** felt in a manoeuvre. In straight and level flight the load factor is 1, since lift = weight





$LF = \frac{Lift}{Weight}$ by definition

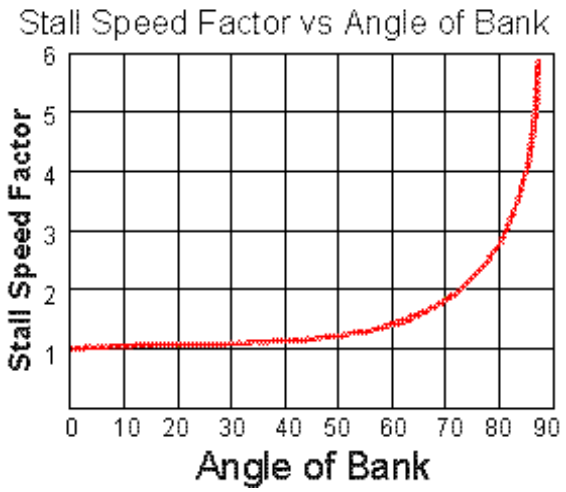
$\frac{Lift}{Weight} = \frac{1}{Cos\,(b)}$ by definition

Therefore $LF = \frac{1}{Cos\,(b)}$

A 30º bank turn leads to a 15% increase in LF and a 7% increase in stall speed
A 60º bank turn leads to a doubling of LF and a 41% increase.

If we bank the aeroplane into a turn, the load factor increa as shown, where b is the angle of bank. Pulling high g in a also leads to an increase in stalling speed in a **dynamic st**

Load Factor or g↑ Stall speed↑



STALL SPEED CHART

Power Off **Stalling Speeds** Knots =IAS

Gross Weight 2,550 lbs. / Condition	Angle Of Bank 0°	30°	45°	60°
Flaps Up	50	54	59	71
Flaps 10°	42	45	50	59
Flaps 30°	40	43	48	57

For example, here are some figures for a typical light aircraft:

3. Contamination

This has a two-fold effect.

- **Increase in weight** due ice accretion on any part of a/c
- **Reduction of CL** due to ice accretion on wing surface. Streamlined airflow breaks down at a higher airspeed as a result of poorer lifting ability of contaminated wing.

4. Slipstream

- Firstly increased airflow over the wing by the propeller will cause delayed separation of streamlined airflow.

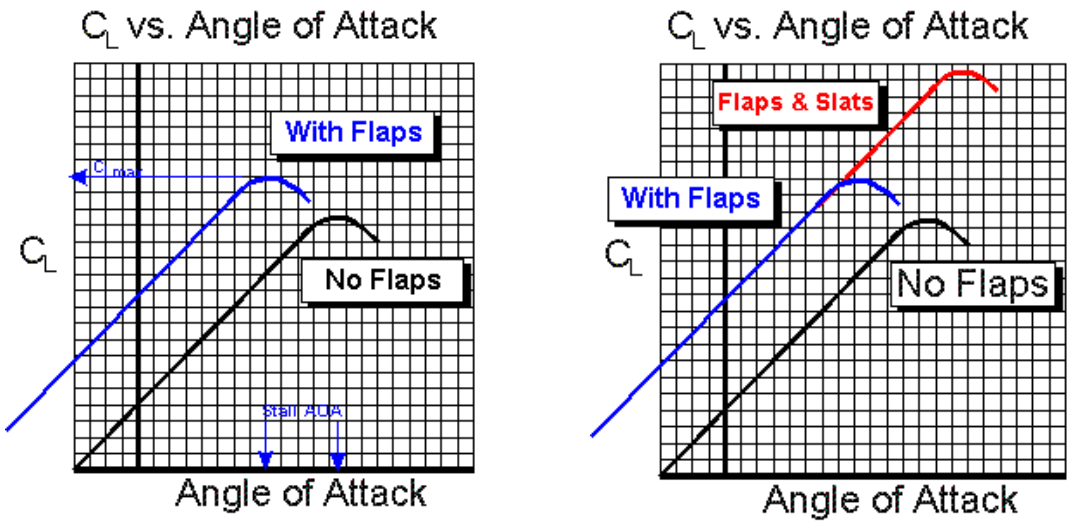
Secondly at the stall, a component of propeller thrust is **inclined vertically**, reducing the lift requirement from the wing, hence stall speed decreases.

5. Wing Area

As the wing area increases, e.g. due to the extension of Fowler flaps, then the stall speed will decrease. However, the extension of flaps also causes a change in camber and so this effect is not normally seen in isolation.

Wing Area ↑ – Stall speed ↓

6. Flaps



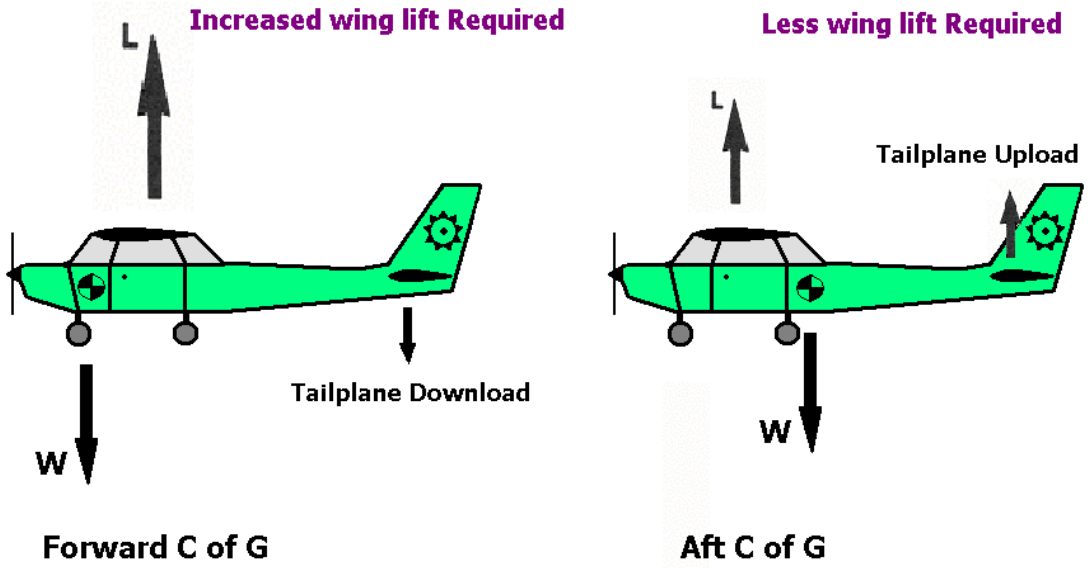
Flaps reduce the Stalling angle of attack, but increases CL, therefore, to maintain a constant lift the stall speed decreases. Slats and slots have a similar effect.

6. Altitude

Stall IAS is unaffected by changes in altitude, however stalling TAS will change.

7. Centre of Gravity

With a fwd C of G, the tailplane must provide more of a download to balance the aircraft. This download must be offset by the lift produced by the wing. Hence as C of G moves forward, more lift is required and therefore the stall speed increases.



Forward C of G

C of G forward – Stall speed ↑

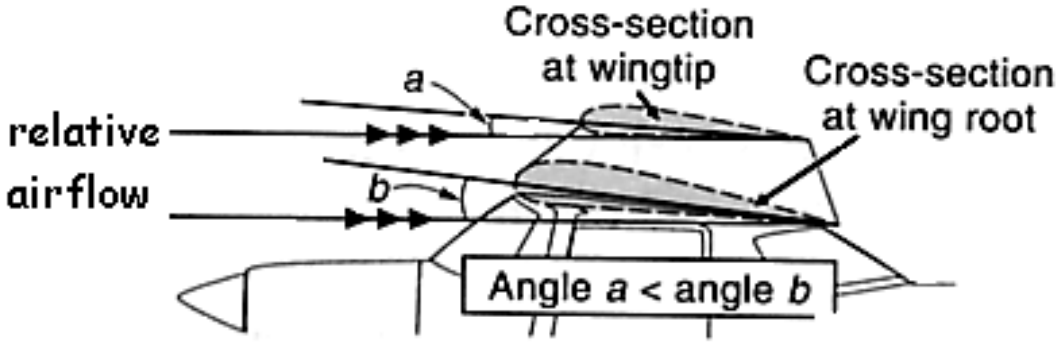
Aft C of G

C of G rearward – Stall speed ↓

Related topics

Washout & Stall Strips

Sometimes at the stall, a wing will drop, and this is undesirable. The reason for the wing dropping is due to tip stall, when the wing tip stalls before the root. To prevent tip stall, the wing can be designed with a twist, so that at the wing root there is a greater angle of incidence than at the tip. This ensures that the root stalls first.



If, however slipstream from the propeller is present, or if flaps are selected, this tends to keep the inboard sections unstalled, and then the tip will stall first. Thus when flaps are set, or power is on, a wing drop is much more likely.

Stall strips or leading edge spoilers may also be attached at the wing root to have the same effect, as do slats and slots.

Stall Warning devices

Aural stall-warners are fitted to most a/c to give about 5-10kts notice of the impending stall. These can be of the electrical type (Piper Warrior) or of the suction reed type (Cessna 152).

Control Effectiveness at the stall
Even though the main wing may be stalled, the tailplane is not usually in a stalled condition, as a result of different aerofoil design, angle of incidence and main wing downwash. All the main flying controls should remain unstalled although their effectiveness will be reduced, as a result of low airspeed.

Elevator Blanketing during stall
High tailed a/c are susceptible to this effect, particularly with flap. This may lead to reduced elevator effectiveness.

Recovery from the Stall
Stall has occurred due to the stalling angle having been exceeded. Therefore, reducing the angle of attack by placing the control column centrally forward will unstall the wings. However, to reduce any height loss, power is normally added in the **Standard Stall Recovery**, and careful use of the rudder to control the yaw.

Wing drop may occur at the stall, particularly if flap or power is used. The natural reaction to use aileron to correct this roll must be suppressed. Further wing drop should be prevented using rudder only.

Secondary Stalls
Following a successful stall recovery, the aircraft will be in a dive. If, however the pilot tries to pull out of the dive too sharply, a secondary higher speed stall may result. During such a pull up manoeuvre, a higher load factor or g is present, leading to an increased stall speed.

HASELL CHECKS
Prior to practicing stalling, we **always** carry out checks to ensure it is safe. These are remembered by the mnemonic HASELL:

H **Height sufficient to recover by 3000'**
A **Airframe. Flaps and gear as required**
S **Security. No loose articles, seat belts tight, seat fixed etc**
E **Engine. Temperatures and pressures OK, Check carb heat**
L **Location: Clear of any**
Active Airfields
Built-up areas
Controlled airspace & Cloud
Danger areas
L **Lookout. Carry out a lookout turn – either a 180°turn or 2 x 90° turns**

Board Briefing

08Jan23

Ex 10b(i) STALLING 1

AIM: To learn to recognise and recover from a clean stall with minimum height loss.
T&E: Other a/c, Engine overheat, Personal Injury, Terrain, Stalling outside envelope, Loss of control.
M: **Lookout, HASELL Checks, Pre-Flight Planning, W&B, Standard Stall Recovery.**

AIREX: **1:** Revision: Start-up, Taxy, Power Checks, Climbing, Turning 2: DEMO of Clean Stall + Recovery

3: ENTRY

H: Height - Sufficient
A: Airframe - as reqd
S: Security - Check
E: Engine - Ts + Ps, CH, Mixture
L: Location - Clear of ABC+D
L: Lookout - 2 x 90° or 1 x 180° turn

(CH) Close Throttle
Maintain Altitude - PAAT
Ailerons Neutral
No Trim <70 kts

Lookout
Turn

7:

STANDARD STALL RECOVERY (SSR)

Control Column Centrally fwd until symptoms stop
Apply FULL Power
Hold Att Steady
Level the Wings
Ease out of the dive

8: RECOVERY AT FIRST SYMPTOM
SSR at first symptom of stall

4: SYMPTOMS OF APPROACHING STALL

Low + Decreasing Airspeed
Sloppy/Unresponsive Controls
High Nose Att
Stall Warning
Light Buffet

5: SIGNS OF THE STALLED CONDITION

Stall Warning
Heavy Buffet
High R.O.D.
Nose Drop
Wing Drop

6: POWER-OFF RECOVERY

CC Centrally fwd until symptoms stop
Hold Att Steady
Level the Wings
Dive at 65 kts

Skeleton Board Briefing

Ex 10b(i) STALLING 1

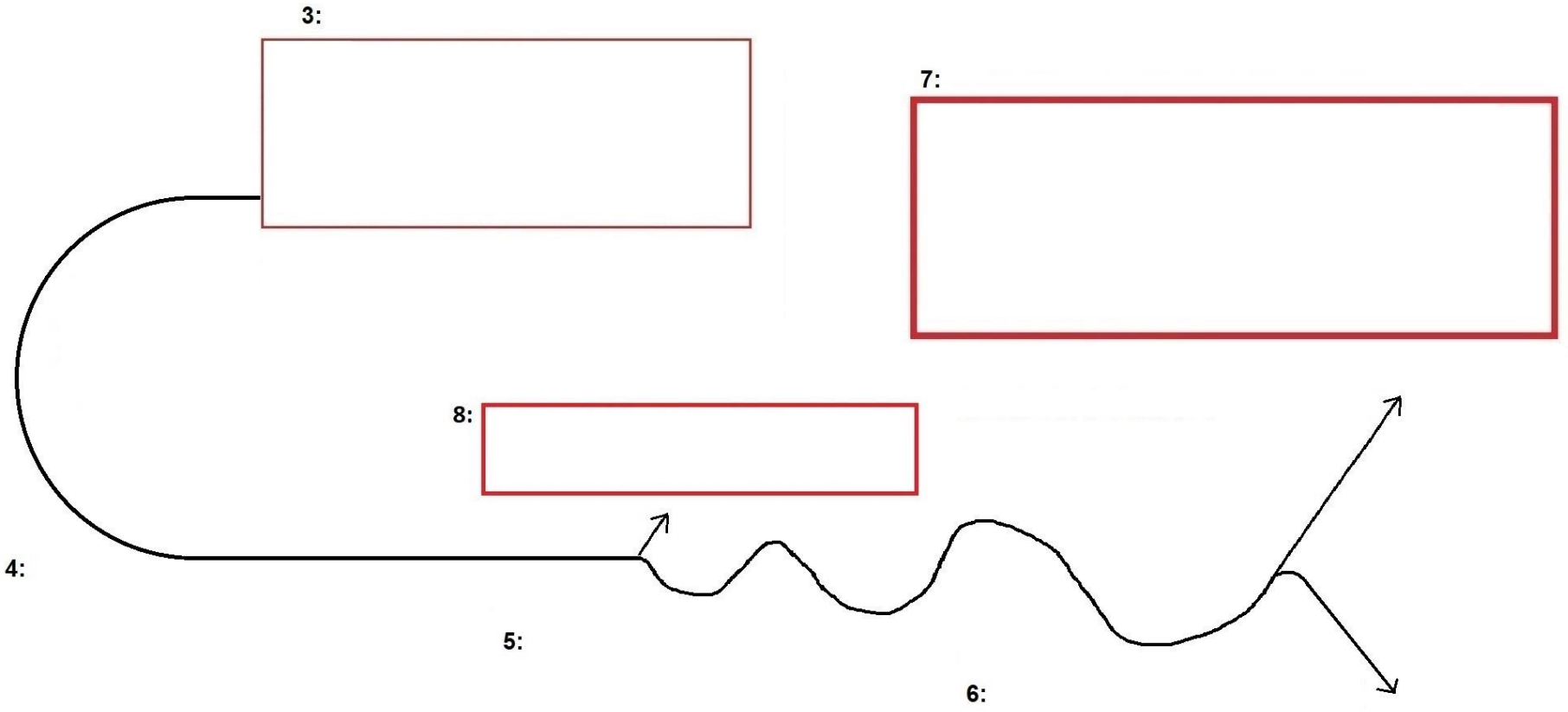
03Jan23

AIM: To learn to recognise and recover from a clean stall with minimum height loss.

T&E:

M:

AIREX: 1: 2:



Pre-Flight Briefing

Make sure you have an aircraft model available and that you use it in the correct orientation relative to the student.

The following is suggested speech for the board briefing above to a single student:

'Good morning, today we are going to do exercise 10b - Stalling Part 1. There are 3 parts to this exercise – the first part we are going to look at today is concerned with recognising and recovering from stalls in the clean configuration. The subsequent parts which we will do in the following lessons involve other configurations.'
'So the aim today is written on the board – **To learn to recognise and recover from a clean stall with minimum height loss**.'
As usual we are going to discuss some threat and error management before we go into the main briefing. Looking out of the window here, I can see lots of aeroplanes taxying towards the runway. What may be a big threat once we get airborne?'
'Other aeroplanes being in our way'
'Yes, other aeroplanes are also going to be in the local area too. How are you going to manage to keep clear of them?'
'Good lookout.'
'Yes, so if either of us see an aeroplane today, we will point it out to the other person, just like before. Remember, when you are climbing, it is hard to see other aircraft in front of you.
'You will be climbing a lot during this exercise in order to get the height we need. Can you think of a threat to the aeroplane from all this climbing?'
'The engine might get hot.'
'Yes, so how can you manage that?'
'By checking Ts and Ps.'
'Absolutely. You can do your normal climb checks and FREDA checks. I will also be introducing a new pre-stalling check called HASELL checks. More about that later.'
'The aircraft may make some abrupt movements during the stalling exercise. What could happen if we are not strapped in?'
'We might get injured.'
'Yes. That will also be managed in the new HASELL checks. It is important to make sure the aircraft is correctly loaded and within the envelope for stalling, so I want you to carry out a mass and balance calculation before we go.'
'That will be enough for us to consider today on the threat and error management side.'
'Let's move on to the actual flight itself. After we finish this briefing, I want you to complete the pre-flight tech log and book out with ATC, and then I want you to go out to the aircraft and carry out the pre-flight checks. Then we will get in together, you will start up the engine using the checklist. I want you to make the radio calls today. You will taxi to the run-up area, where you will do the power checks and the before take-off checks from the checklist. Then I will ask you to taxi and line me up on the runway, ready for my take off. I will take-off and get us heading towards Newbury before handing control back to you. I want you to climb to 3500' in the normal way and then carry out a FREDA check.'

'The first thing I will do is demonstrate to you a full clean stall and recovery using the **Standard Stall Recovery** technique. Then I will teach you how to carry out a HASELL check. Every time we stall the aircraft we must carry out a HASELL check – not just for the first stall, but for all subsequent stalls.'

‘During a stall, the aircraft will lose height, so it is important to make sure we start at a suitable altitude in the first place. At this school we teach that we must begin at a suitable height to recover by 2000’ above ground level. So, by starting at 3500’ we can be sure of that. So, H is for height. Then we come to A – Airframe. What gear and flap configuration do we want for out stall? Well, in this aircraft, the gear is fixed, and today, we will be doing clean stalls, so we just check that the flaps are retracted. S is for security – check that both of us have our seat belts fastened, and that there are no loose articles in the cabin. E is for engine – we check the Ts and Ps, and give the carb heat 10 seconds at hot. The first L is for location – we don’t want to stall over a built up area or too close to cloud, so we check that we are clear of As, Bs, Cs and Ds – Airfields, Built-up areas, Controlled airspace and cloud, and danger areas. The second L is for lookout. We need to make sure that there are no other aircraft near us, particularly below us, so we make a lookout turn or two. We can either make a 180 degree turn, or two 90 degree turns. During these turns, we will both look out, especially below. Once the HASELL check is complete I will teach you the symptoms of an approaching stall. First, I will put the carb heat on and close the throttle, maintaining altitude with elevator. I will keep the ailerons neutral.’

‘First you will notice the airspeed low and decreasing, then I will give you control briefly to feel that the controls are sloppy and unresponsive. You will notice the high nose attitude. You will hear the stall warner, and you may notice a light buffet. These are all symptoms that the aircraft is approaching the stall.’

‘Then I will fully stall the aircraft. I will teach you the symptoms of the stalled condition – The stall warner will be going, there will be heavy buffeting, there will be a high rate of descent, there may be a wing drop and the nose will drop. I will then show you that at any time, just by moving the control column centrally forwards, I can make these symptoms go away. I will move the control column centrally forward and the buffet will go away, the stall warner will stop, and the high nose attitude and sloppy controls will go away. We will still have the high rate of descent though, but we have recovered from the stall.’

‘Then I will put us back at 3500’, carry out another HASELL check and I will repeat the stall and recovery while you follow me through on the controls. After that I will put us back at 3500’ and I want you to set the aircraft up for a stall and recover using the elevator. What must you remember to do before that stall?’
‘A HASELL check.’
‘Yes. Always. The stall recovery we have just practiced gets us out of the stall, but it leaves us descending towards the ground – not an ideal situation. So next, you will follow me through while I teach you a better method called the Standard Stall Recovery. I want you to put one finger on the throttle too so you can feel my inputs there, because in this technique, I will use full power as well as elevator to recover from the stall. Once we have recognised that the aircraft is stalled, I will move the control column centrally forward until the buffet or stall warner stops, and then apply full power. I may need to balance this with some right rudder. I will then hold the attitude steady and level the wings if necessary. I will then ease out of the dive gently. I want you to notice how much altitude was lost during the recovery.’
‘After that, I will give you control, and I want you to practice recovering from a few stalls using the Standard Stall Recovery.’

‘But why would you wait for all of these symptoms to occur before recovering from the stall. It would be much better if you were to recover at the first sign of any of these symptoms. This is sometimes called the incipient stage, and it occurs before the aircraft has actually stalled. So, you will follow me through with one finger on the throttle, while I teach you how to recover from a stall at this stage. I will set it up as before, but this time, as soon as I hear the stall warner I will apply the Standard Stall Recovery straight away. You will see that we lose very little height doing it this way.’

'Then I will give you control and I want you to practice recovering from stalls at the first symptom.'

'Once you have had plenty of practice at stall recovery, you will fly me back to the airfield. As we approach, I will take control, and I want you to watch as I rejoin for the circuit and landing. I want you to make the radio calls. After landing, having cleared the runway, I will give you control to taxi clear and carry out the after landing actions. Do you have any questions?'

Air Exercise (Lesson Points correspond to the numbers in the Flight Prompt Cards)

On the Ground:	The student should now need no assistance or prompting to get the aircraft as far as lining up on the runway for your take-off.
Take-Off:	As before, carry out the take-off while the student observes. Use the checklist and ask the student to make the radio calls. Handover control shortly after take-off to allow revision of climbing and turning.
Lesson Point 1:	**STUDENT PRACTICE** of climbing into the local area to a suitable altitude (say 3000'). Take control from the student when the aircraft is set up, trimmed in straight and level flight at the assigned altitude with all checks complete.
Lesson Point 2:	A demonstration only, with no follow through, of the approach to a clean stall (including HASELL Checks. **NOTE:** It is acceptable (and indeed preferable) to give this demonstration at the end of the last Exercise: Slow Flight. 'I have control. I am now going to demonstrate the full stall and standard stall recovery. I just want you to watch what happens – we will break it down later'. Carry out a HASELL check and demonstrate in silence a full clean stall with SSR. 'So, by the end of this lesson, you should be able to do that.'
Lesson Point 3:	Teaching of the HASELL checks. 'I have control. We are now in the local area and ready to start the exercise. Remind me what we must always do before practicing a stall.' 'That's right a HASELL check. So, our Height is 3000', which is sufficient to recover by 2000' agl. Airframe: We are clean, which is what we want for this stall. Security: I am secure, are you? No loose articles in the aircraft. Engine: Ts & Ps are checked OK, and I will put the Carb Heat on for 10 seconds. Location: We are not above any Airfields, Built-Up areas, Controlled Airspace or Cloud, or Danger Areas. Now the Lookout. I will do a 90 degree turn to the left followed by one to the right. Give me a hand looking for other traffic, please.'
Lesson Point 4:	'OK, so we are now ready to start the approach to the stall. No need to follow me through, just watch my demonstration. So, I begin by putting on the Carb Heat to protect the engine. I close the throttle, keeping the aircraft straight with rudder. I am preventing the nose from dropping by holding the back pressure. I am trimming some of it off. Still holding the back pressure.' You may wish to leave some power on to prolong the deceleration and allow you to better point out the symptoms. 'Notice the high nose attitude. I can remove this symptom of the stall by simply moving the control column centrally forwards – see. But let's say I don't do that – I keep holding the nose up. The next thing I notice is the reduced airspeed. Again, I can remove this symptom of the stall by moving the control column centrally forwards – see. But let's say I keep holding the nose up. The next thing I notice is the sloppy controls – have a feel. Again, I can remove this symptom of the stall by moving the

	control column centrally forwards – see. But let's say I keep holding the nose up. The next thing I notice is the stall warner sounding. Again, I can remove this symptom of the stall by moving the control column centrally forwards – see. At any time that any of these symptoms of an approaching stall occur, I can remove them by just moving the control column centrally forwards.' At this point, move the control column centrally forwards to remove all symptoms of the approaching stall.
Lesson Point 5:	Reposition the aircraft to 3000'. 'Now I'd like you to have a go at carrying out a HASELL check and setting the aircraft up for the approach to the stall. I want you to note each symptom and when you have seen all the symptoms, remove them by moving the control column centrally forwards. You have control.' **STUDENT PRACTICE.**
Lesson Point 6:	Reposition the aircraft to 3000'. 'Now I'd like you to carry out another HASELL check. Then you will follow me through as I repeat that all the way through to a full stall and recovery by moving the control column centrally forwards. You have control.' **STUDENT PRACTICE.** Once satisfactorily carried out. 'I have control follow me through. I look ahead for a feature to help me keep straight throughout – let's use that lake. I apply the carb heat, close the throttle and hold the altitude. The speed is reducing, the controls are becoming sloppy, the stall warner sounds, and there, feel the buffet and see how the nose dropped? That is the stall. I recover by moving the control column centrally forward. Notice now all of those symptoms have gone and the aircraft is flying normally again.'
Lesson Point 7:	Ask the student to reposition the aircraft to 3000'. 'Now I'd like you to carry out another HASELL check. Then I want you to set the aircraft up for a full stall and recover by moving the control column centrally forwards. You have control.' **STUDENT PRACTICE.** Further practice as needed. The student should go straight into a HASELL Check. If not, take control and ask them if it is safe to practice a stall? You should not need to mention HASELL checks again.
Lesson Point 8:	'Notice in the stalls we practiced, we lost about 400' during the stall and recovery. This could be quite a lot if we were close to the ground. So, now, we will move on to recovery from the stall using power. I will teach you the **Standard Stall Recovery**. Again we will start at 3000', and let's see how much altitude we lose in the recovery. First the HASELL Checks. You have control' **STUDENT PRACTICE.** Once satisfactory. 'Follow me through on the controls and put one of your fingers on the throttle so you can feel my input there. So, again, I am looking for a feature in the distance to help me keep straight. I put on the Carb Heat and close the throttle. I am holding the back pressure and maintaining my altitude of 3000' as the airspeed reduces. Now we hear the stall warner. I'm still holding the

	back pressure. There is the buffet and now the nose drop. To recover I move the control column centrally forwards until the symptoms stop, and then apply full power. As soon as I do that, the stall warner stops and the airspeed increases. I hold that attitude. Now I can slowly recover from the descent and turn off the Carb Heat. Notice we have only lost about 200' during that recovery. So the Standard Stall Recovery results in a reduced height loss and is a much safer way to recover.'
Lesson Point 9:	'Now, I want you to practice recovering from a fully developed stall using the Standard Stall Recovery. You have control.' **STUDENT PRACTICE.** Make sure the student goes straight into a HASELL Check. Then more practice. At least 5 standard stall recoveries should be completed to an acceptable standard.
Lesson Point 10:	'So, by using the Standard Stall Recovery we have improved our height loss, but 200' is still a lot to lose. Can we do any better? Well the way to do that is to recover before the aircraft fully stalls, at the first symptom of the approaching stall. This time I will teach you to recover as soon as we hear the stall warner. First the HASELL Checks.' **STUDENT PRACTICE.** Once satisfactory. 'Follow me through, one finger on the throttle. So, as before, I am looking for a feature in the distance to help me keep straight. I put on the Carb Heat and close the throttle. I am holding the back pressure and maintaining my altitude of 3000' as the airspeed reduces. Now we hear the stall warner. To recover I move the control column centrally forwards until the warner stops and then apply full power. As soon as I do that, the airspeed increases. Now I can slowly recover from the descent and turn off the Carb Heat. Notice we have only lost about 100' during that recovery. So recovery at the first symptom of the approaching stall with the Standard Stall Recovery gives the least height loss.'
Lesson Point 11:	'Now, I want you to practice recovering from a stall at the first symptom, using the Standard Stall Recovery. You have control.' **STUDENT PRACTICE.** Make sure the student goes straight into a HASELL Check. Practice several stalls at different stages of the stall.
Approach & Landing:	As before, the student should be able to fly the rejoin, making all radio calls, as far as final. Take over and land, pattering the last part of the approach and landing.
After Landing, Shutdown & Post-flight:	As before, return control to the student after vacating the runway. All actions and checks should now be flowing well.

Flight Prompt Card

Ex 10b(i): Stalling 1

AIREX
1: REVISION: Climbing & Turning. FREDA.
2: DEMO only Clean Stall & SSR (Standard Stall Recovery).
3: TEACH HASELL cx.
4: DEMO/FT approach only to clean stall. Show symptoms one at a time - High Nose Att, Low IAS, Sloppy Controls, Buffet, Stall warner. Remove symptoms by Control Column (CC) centrally forward.
5: STUDENT PRACTICE HASELL & approach to stall as above. Recovers by CC centrally fwd.
6: DEMO/FT full clean stall & recovery by CC cent fwd.
7: STUDENT PRACTICE w HASELL.
8: Height LOSS was unacceptable. STANDARD STALL RECOVERY DEMO/FT Student FT with 1 finger on throttle. Ht LOSS - still significant.
9: STUDENT PRACTICE (Several times).
10: DEMO/FT RECOVERY AT FIRST SIGN. Recover at stall warner or buffet. NOTE Ht LOSS – much better.
11: STUDENT PRACTICE (Several times).

Debriefing

- The take home message is that moving the control column centrally forwards will break the stall, but that the 'Standard Stall Recovery' is even better. The best of all is the Standard Stall Recovery actioned at the first symptom of the approaching stall. Make sure the student can recite it correctly and without hesitation.

Common Student Faults

- Failure to carry out HASELL Checks before each and every stall. I personally dislike the abbreviation to HELL Checks for subsequent stalls, as the vital items of Airframe and Security are removed!! No examiner will ask the student to carry out HASELL checks – they are an integral part of the stalling exercise, and their omission could result in failure of that section. Make sure that the student involves you in the lookout. You could pretend to be looking at your kneeboard – heads down – while the student is looking out, to see if this gets any reaction. If the student attempts to practice a stall without first carrying out a HASELL check, take control and ask them if it is safe to do that?
- Sometimes the student carries out a perfect HASELL check, and then delays before starting the stall. As soon as the lookout is complete, go straight into the stall before the traffic situation changes.
- No examiner will call for a student to 'Recover Now' – those days are long gone! In real life, there will be no-one to call it either.
- Too slow a response to recovering from the stall, especially with the throttle. Students have been correctly taught to be gentle with the throttle, but this is the exception!
- An insufficiently positive recovery action. This is not a gentle lowering of the nose - It should be positive but not violent.
- Many students become very concerned about the Carb Heat, and will often delay the stall recovery in order to turn it off. Point out that a stall is a potentially life-threatening situation, and the first action must be the Standard Stall Recover. Turning the Carb Heat to cold can come later.

Common Instructor Faults

- This is the first exercise in which synchronising the flying demonstration and the speech poses a major problem. The entry to and recovery from the stall can happen very quickly, and it is really hard to keep the speech at the same pace. One way round this, in the entry to the stall, is to add a little power, rather than start from idle. This makes the deceleration slower and gives the voice a chance to catch up.
- Most instructors will teach the student to move the control column centrally forward. This is correct, but some students may continue to push forward, as no limit has been given. The correct terminology is to *move the column centrally forward until the stall warner and buffet stops*.
- Do not refer to 'lowering the nose' as a way to break the stall. The correct term is 'moving the control column centrally forwards'. If the aircraft were inverted, lowering the nose would make the situation worse.
- When demonstrating a HASELL check followed by a stall, once the lookout is complete, go straight into the stall before the traffic situation changes.
- The terms 'incipient stall' and 'first sign' are falling out of fashion. Better to say 'first symptom of an approaching stall'.
- For a while, the standard stall recovery was taught with a **simultaneous** movement of the control column and power. Now, the preferred way to teach it is control column centrally forward, **THEN** apply full power. This advice is contained in **CAA SN-2014/003** partly reproduced below:

> - Following recent accidents and incidents, a great deal of research has been conducted by both industry and regulators on how best to train pilots to avoid losing control of their aircraft (LOC accidents).
> - The use of an incorrect technique when attempting to recover from a stall has been identified as a causal factor in several Loss of Control (LOC) accidents. The standard stall recovery technique should always emphasise the requirement to reduce the angle of attack in order to return the aeroplane to a safe flying condition. When an approach to the stall is recognised early, and the correct recovery action is initiated without delay, this reduction in angle of attack (and consequential height loss) will be minimised.
> - It should be noted that at high altitudes, compressibility has a marked effect on the stalling angle of attack, reducing it significantly. The pilot is thus faced with a narrow manoeuvre margin; in addition, the thrust available at high altitudes is also significantly reduced. Both factors mean that any stall recovery at altitude may prove surprisingly different from those set piece exercises that are routinely practiced at low to medium levels.
> - **NOTE:** Any manufacturer's recommended stall recovery techniques must always be followed, and will take precedence over the technique described above should there be any conflicting advice.

The order should be firstly the control column centrally forward, **THEN** followed by the power. It is acceptable to do the two actions at the same time, but **NEVER** allow the student to lead with power. If the aircraft is not stalled, ie in a recovery from the first symptom, then it is not absolutely necessary for the control column to be moved forward at all, since no stall has occurred. However, for the sake of simplicity, always insist on the SSR as described.

Ex 10b(ii) – Stalling 2

Long Briefing

To be added.

Board Briefing

Ex 10b(ii) Stalling 2

08Jan23

AIM: To learn to recognise and recover from stalls entered with flap, power and bank with minimum ht loss.
T&E: Other a/c, Envelope, Engine overheat, Terrain and obstacles, Flap overspeed, Loss of control.
M: Lookout, HASELL checks, Pre-flight planning, V_{fe}, Standard Stall Recovery (SSR).

Airex: 1: Revision: Clean Stall Recovery

2: EFFECT OF FLAP

FULL FLAP - IDLE - S&L
Lower Stalling Speed
Lower Nose Att
Increased Decel
Wing Drop?
SSR - Remove Drag Flap First

3: EFFECT OF POWER

CLEAN - 1500 rpm - S&L
Lower Stalling Speed
Higher Nose Att
Slower Deceleration
Wing Drop?
SSR

4: EFFECT OF AoB

CLEAN - IDLE - 30° AoB
Higher Stalling Speed
Increased Decel
Wing Drop?
SSR - Level wings later

5: APPROACH CONFIG STALL

6: LANDING CONFIG STALL

7: DEPARTURE STALL

FULL POWER CLIMB
FLAP FULL
RECOVER AT 1ST SYMPTOM OF APPROACHING STALL
SSR - Drag Flap!

Skeleton Board Briefing

Ex 10b(ii) Stalling 2

07 Aug 21

AIM: To learn to recognise and recover from stalls entered with flap, power and bank with minimum ht loss.
T&E:
M:

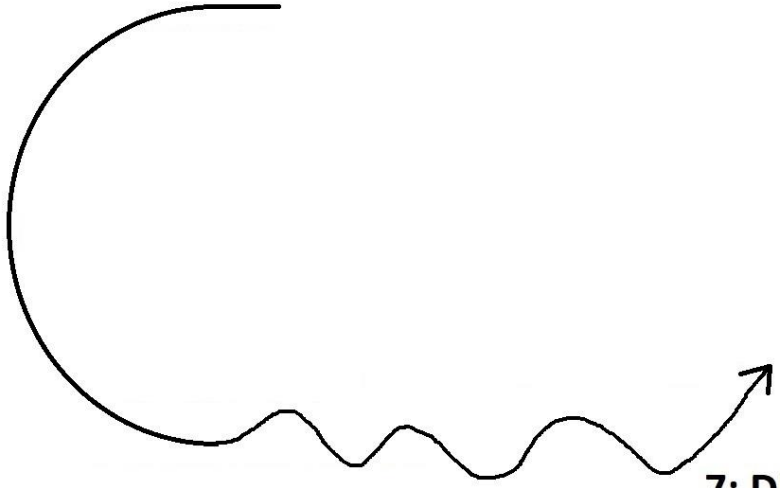
Airex: 1: Revision: Clean Stall Recovery

2: EFFECT OF FLAP

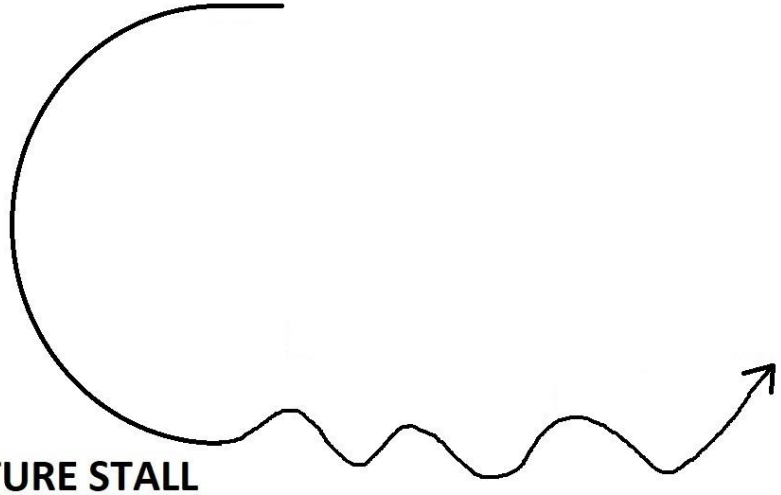
3: EFFECT OF POWER

4: EFFECT OF AoB

5: APPROACH CONFIG STALL



6: LANDING CONFIG STALL



7: DEPARTURE STALL

Air Exercise (Lesson Points correspond to the numbers in the Flight Prompt Cards)

On the Ground:	The student should now need no assistance or prompting to get the aircraft as far as lining up on the runway for your take-off.
Take-Off:	As before, carry out the take-off while the student observes. Use the checklist and ask the student to make the radio calls. Handover control shortly after take-off to allow revision of climbing and turning.
Lesson Point 1:	**STUDENT PRACTICE** of climbing into the local area to a suitable altitude (say 3000'). Ask to see a stall and recovery using the standard stall recovery. Once satisfactory:
Lesson Point 2:	Effect of Flap: Full flap stall. 'We are now at 3000' in the local area and are going to have a look at the effect of flap on the stall. I'd like you to set the aircraft up ready for a stall, please. You have control.' Make sure a satisfactory HASELL check is carried out. Then reduce speed and set up in straight and level flight with full flap: 'I have control. I want you to follow me through as I demonstrate a stall and recovery with full flap set. I pick a feature in the distance, add the carb heat, reduce power to idle and hold the altitude steady at 3000'. I am maintaining the aircraft in balance with rudder. Note the lower nose attitude and slower stall speed as a result of the flap. There is the stall – I recover using the standard stall recovery. However, as soon as I have added full power, I remove the drag flap. I remove the rest of the flap in stages when we have a positive rate of climb and the speed is 65 kts or more. Did you notice how the wing dropped when the aircraft stalled. That is quite common when stalling with flaps.'
Lesson Point 3:	'Now, I want you to practice a stall with full flap set, and recover at the stalled condition. You have control'.' **STUDENT PRACTICE.**
Lesson Point 4:	Effect of Power: Power on stall. 'We are now at 3000' in the local area and are going to have a look at the effect of engine power on the stall. I'd like you to set the aircraft up ready for a clean stall, please. You have control.' Make sure a satisfactory HASELL check is carried out. Then: 'I have control. I want you to follow me through as I demonstrate a full stall and recovery with approach power set. Instead of closing the throttle, I am going to set 1500 rpm (or as required). I pick a feature in the distance, add the carb heat, reduce power to 1500 rpm and hold the altitude steady at 3000'. I am maintaining the aircraft in balance with rudder. Note the higher nose attitude and slower stall speed as a result of the power. There is the stall – I recover using the standard stall recovery. Did you notice how the wing dropped a bit when the aircraft stalled. That is quite common with power on stalls.'
Lesson Point 5:	'Now, I want you to practice a stall with approach power set, and recover at the stalled condition. You have control'.' **STUDENT PRACTICE.**

Lesson Point 6:	Effect of Angle of Bank: 'We are now at 3000' again in the local area and are going to have a look at the effect of angle of bank on the stall. I'd like you to set the aircraft up ready for a clean stall, please. You have control.' Make sure a satisfactory HASELL check is carried out. Then: 'I have control. I want you to follow me through as I demonstrate a full stall and recovery with 30 degrees angle of bank. I add the carb heat, reduce power to idle, bank left or right 30° and hold the altitude steady at 3000. I am maintaining the aircraft in balance with rudder. There is the stall – I recover using the standard stall recovery: Control column centrally forward, full power, roll the wings level.'
Lesson Point 7:	'Now, I want you to practice a stall with 30° angle of bank, and recover at the stalled condition. You have control' **STUDENT PRACTICE.** Make sure that the correct technique is followed.
Lesson Point 8:	Full stall in 'Base Turn Configuration': 'We are now at 3000' again in the local area and are going to have a look at the effect of a combination of the previous factors on the stall. I'd like you to set the aircraft up ready for a stall with approach flap, please. You have control.' Make sure a satisfactory HASELL check is carried out. Then: 'I have control. I want you to follow me through as I demonstrate a full stall and recovery in the base turn configuration. I add the carb heat, reduce power to 1500 rpm, bank left or right 30° and hold the altitude steady at 3000. I am maintaining the aircraft in balance with rudder. There is the stall – I recover using the standard stall recovery: Control column centrally forward, full power, roll the wings level. As I climb away and the speed is good, I retract the flap in stages.'
Lesson Point 9:	'Now, I want you to practice a stall in the base turn configuration, and recover at the stalled condition. You have control' **STUDENT PRACTICE.** Make sure that the correct technique is followed.
Lesson Point 10:	Full stall in 'Final Approach Configuration': 'We are now at 3000' again in the local area and are going to have a look at the effect of another combination of the previous factors on the stall. I'd like you to set the aircraft up ready for a stall with full flap, please. You have control.' Make sure a satisfactory HASELL check is carried out. Then: 'I have control. I want you to follow me through as I demonstrate a stall and recovery in the final approach configuration. I pick a feature in the distance, add the carb heat, reduce power to 1500 rpm and hold the altitude steady at 3000'. I am maintaining the aircraft in balance with rudder. There is the stall – I recover using the standard stall recovery. However, as soon as I have added full power, I remove the drag flap. I remove the rest of the flap in stages when we have a positive rate of climb and the speed is 65 kts or more.'
Lesson Point 11:	'Now, I want you to practice a stall in the final approach configuration, and recover at the stalled condition. You have control'.' **STUDENT PRACTICE.** Again, make sure that the correct technique is followed.

Lesson Point 12:	Departure Stall. 'We are now at 4000' in the local area and are going to have a look at the approach to a stall on departure. We are going to imagine that we have mishandled a go-around and have left the flaps at full and allowed the speed to reduce. I'd like you to prepare the aircraft for a full flap stall please. Make sure a satisfactory HASELL check is carried out. Make sure sufficient height is available in case a spin develops: 'I have control. I want you to follow me through as I demonstrate the approach to a departure stall and recovery. I add full power and adopt the climbing attitude. I am maintaining the aircraft in balance with rudder. I allow the speed to reduce below the normal climb speed. Note the very high nose attitude. There is the stall warner– I recover using the standard stall recovery. However, full power is already on. I remove the drag flap after moving the control column centrally forward. I remove the rest of the flap in stages when we have a positive rate of climb and the speed is 65 kts or more. Did you notice how the wing dropped when the aircraft approached the stall? This is a dangerous situation in which to stall the aircraft as a spin can develop.'
Lesson Point 13:	'Now, I want you to practice the approach to a departure stall with full flap set, and recover at the first symptom of the stall. You have control'.' **STUDENT PRACTICE.** Do not allow a severe wing drop or spin to develop.
Lesson Point 14:	Approach to stall in 'Base Turn Configuration': 'We are now at 3000' again in the local area and I want you to show me a stall in the base turn configuration, but I want you to recover at the first symptom of the stall. You have control.' Make sure a satisfactory HASELL check is carried out.
Lesson Point 15:	Approach to stall in 'Final Approach Configuration': 'We are now at 3000' again in the local area and I want you to show me a stall in the final approach configuration, but I want you to recover at the first symptom of the stall. You have control.' Make sure a satisfactory HASELL check is carried out.
Approach & Landing:	As before, the student should be able to fly the rejoin, making all radio calls, as far as final. Take over and land, pattering the last part of the approach and landing.
After Landing, Shutdown & Post-flight:	As before, return control to the student after vacating the runway. All actions and checks should now be flowing well.

Flight Prompt Card

Ex 10b(ii): Stalling 2

AIREX:
1: REVISION Climbing & Full Stall with SSR.
2: EFFECT OF FLAP: DEMO/FT Full Flap Stall & SSR. NOTE: Lower Nose Att, Stall speed slower, More Pronounced Stall. Wing drop more likely.
3: STUDENT PRACTICE.
4: EFFECT OF POWER: DEMO/FT full stall with 1500 rpm & SSR. NOTE: Higher Nose Att, Slower stall speed. Wing drop more likely. More Pronounced Stall.
5: STUDENT PRACTICE.
6: EFFECT OF AoB: DEMO/FT clean stall with 20-30° AoB. NOTE: CC Centrally fwd then full power, then roll.
7: STUDENT PRACTICE.
8: FULL STALL IN BASE TURN CONFIG: DEMO/FT. Base Turn Full Stall & SSR. 9: STUDENT PRACTICE.
10: FULL STALL IN FINAL APP CONFIG: DEMO/FT. Final App Config full stall & SSR.
11: STUDENT PRACTICE.
12: DEPARTURE STALL: DEMO/FT. Full Power, enter a climb & continue back press until stall warner. SSR. NOTE: High Nose Att, Severe Wing drop in either direction. Possible Spin.
13: STUDENT PRACTICE.
14: STALL IN BASE TURN CONFIG STUDENT PRACTICE of Base Turn Stall & SSR at 1st symptom.
15: STALL IN FINAL APP CONFIG: STUDENT PRACTICE of Final App Config stall & SSR at 1st symptom.

Debriefing

- The important message here is that whatever configuration, the Standard Stall Recovery works.

Common Student Faults

- Hesitation before initiating recovery.
- In the stall during a turn, many students will level the wings before moving the control column centrally forwards. Stress the Standard Stall Recovery. In the final approach stall, many students will leave the drag flap extended until a positive rate of climb has been noted. Point out that a positive rate of climb may not ever be achieved if the drag flap is not retracted straight away.

Common Instructor Faults

- The Standard Stall Recovery is absolutely critical. It must be taught correctly and be learned correctly by the student:

  Imagine two students put forward for test. In the clean stall, student A performs the perfect recovery technique, but loses 600'. Student B adds power first the holds the attitude steady, resulting in no altitude loss. Which student(s) should pass or fail? The answer is student A should pass. His technique will improve, since he has grasped the correct technique. Student B should fail since his incorrect technique will lead to problems in the future, despite getting away with it this time.

Ex 10b(iii) – Stalling 3

Long Briefing

To be added

Board Briefing

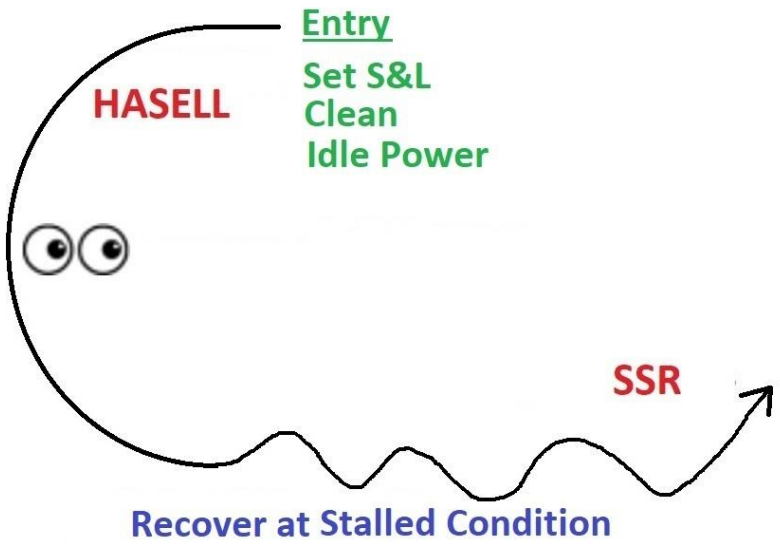
Ex 10b(iii) Stalling 3

08Jan23

AIM: To learn to recognise and recover from secondary stalls and unbalanced stalls.
T&E: Other a/c, Envelope, Engine overheat, Terrain and obstacles, Loss of control.
M: Lookout, HASELL Checks, Pre-Flight Planning, W&B, Standard Stall Recovery.

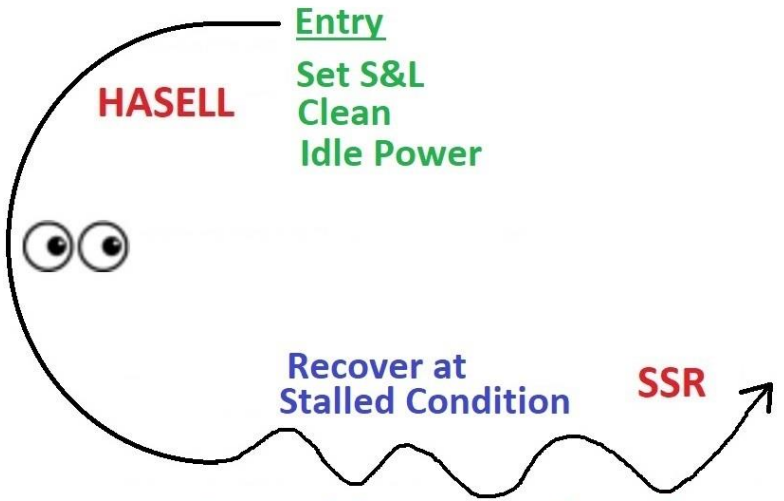
Airex: 1: Revision: Practice Various Stall Recoveries

2: Secondary Stalls



Insufficient pitch results in Secondary Stall!

3: Secondary Dynamic Stalls

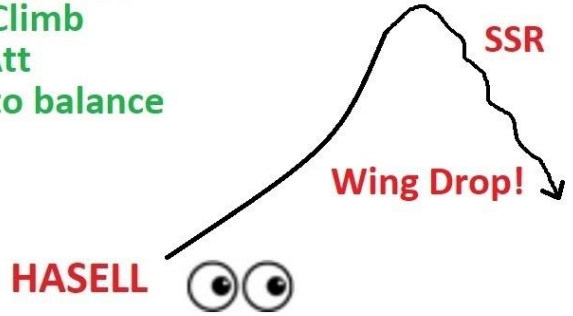


Too rapid a recovery from dive results in Secondary Stall!

4: Unbalanced Stall

Entry

Full Power Climb
High Nose Att
No Rudder to balance



Skeleton Board Briefing

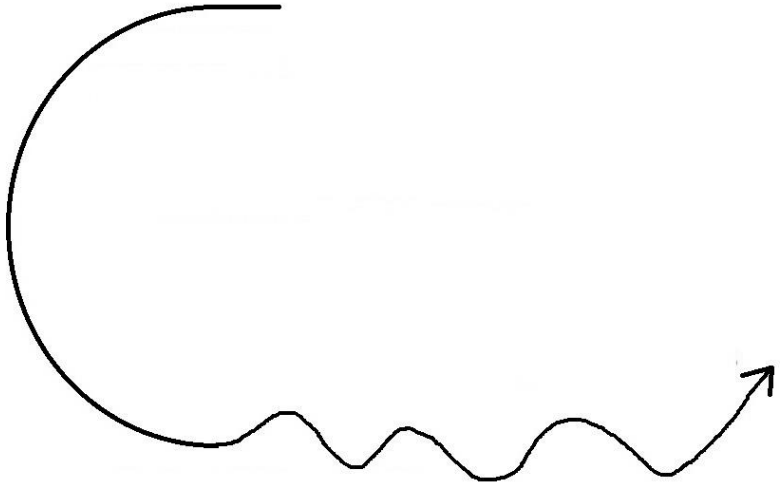
Ex 10b(iii) Stalling 3

03Jan23

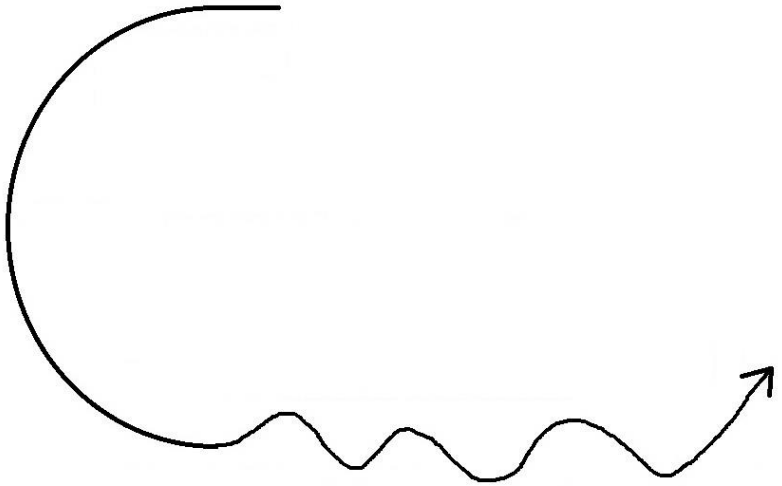
AIM: To learn to recognise and recover from secondary stalls and unbalanced stalls.
T&E:
M:

Airex: 1: Revision:

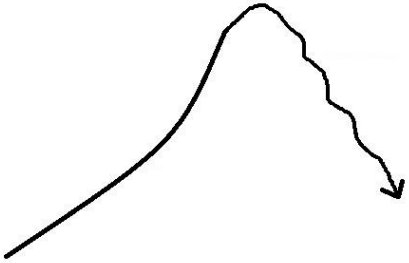
2: Secondary Stalls



3: Secondary Dynamic Stalls



4: Unbalanced Stall



Air Exercise (Lesson Points correspond to the numbers in the Flight Prompt Cards)

On the Ground:	The student should now need no assistance or prompting to get the aircraft as far as lining up on the runway for your take-off.
Take-Off:	As before, carry out the take-off while the student observes. Use the checklist and ask the student to make the radio calls. Handover control shortly after take-off to allow revision of climbing and turning.
Lesson Point 1:	**STUDENT PRACTICE** of climbing into the local area to a suitable altitude (say 3000'). Ask to see a clean stall and recovery using the standard stall recovery, recovering at the stalled condition. Ask to see recovery from the approach to a stall in the base turn configuration. Ask to see recovery from the approach to a stall in the final approach configuration. Once satisfactory:
Lesson Point 2:	Secondary Stall: 'We are now at 3000' in the local area and are going to have a look at what is called a secondary stall. I'd like you to set the aircraft up ready for a clean stall, please. You have control.' Make sure a satisfactory HASELL check is carried out. 'I have control. I want you to follow me through as I demonstrate a stall and recovery with insufficient pitch during recovery. This will lead to a secondary stall. I pick a feature in the distance, add the carb heat, reduce power to idle and hold the altitude steady at 3000'. I am maintaining the aircraft in balance with rudder. There is the stall warner, now the nose drops. I recover using the standard stall recovery. However, I don't move the control column forward enough. Notice the stall warner sounds again. That is called a secondary stall and could have been avoided if I had used more control movement. I don't want you to practice that.'
Lesson Point 3:	Secondary Dynamic Stall: 'We are now at 3000' in the local area and are going to have a look at what is called a secondary stall. I'd like you to set the aircraft up ready for a clean stall, please. You have control.' Make sure a satisfactory HASELL check is carried out. 'I have control. I want you to follow me through as I demonstrate a stall and recovery with too rapid a pull-out from the dive during recovery. This will lead to a secondary dynamic stall. I pick a feature in the distance, add the carb heat, reduce power to idle and hold the altitude steady at 3000'. I am maintaining the aircraft in balance with rudder. There is the stall warner, now the nose drops. I recover using the standard stall recovery. However, I pull out of the dive too rapidly. Notice the stall warner sounds again. That is called a secondary dynamic stall and could have been avoided if I had eased out of the dive gently. I don't want you to practice that.'

Lesson Point 4:	Unbalanced Yaw at the Stall: 'We are now at 4000' in the local area and are going to have a look at the effect of unbalanced yaw on a clean stall. I'd like you to prepare the aircraft for a clean stall please. Make sure a satisfactory HASELL check is carried out. Make sure sufficient height is available in case a spin develops: 'I have control. I want you to follow me through as I demonstrate a full stall with unbalanced yaw. I add full power and adopt the climbing attitude. I am NOT maintaining the aircraft in balance with rudder. I allow the speed to reduce below the normal climb speed. Note the very high nose attitude. There is the stall warner. I keep holding the high nose attitude. Recover as soon as the wing drop occurs and before a spin develops by moving the control column centrally forward. 'I move the control column centrally forward and recover. Did you notice how the wing dropped when the aircraft approached the stall? This is a dangerous situation in which to stall the aircraft as a spin can develop. It is because I did not keep the ball in the centre. I don't want you to practice that.'
Lesson Point 5:	'What I do want you to practice is the CORRECT stall recovery technique. Ask to see one or more of the test stalls. Ensure the recovery is correct.
Lesson Point 6:	'Are you interested in seeing a spin at all?' If so, demo/patter a short spin. If the student does not want to, do NOT push it!
Approach & Landing:	As before, the student should be able to fly the rejoin, making all radio calls, as far as final. Take over and land, pattering the last part of the approach and landing.
After Landing, Shutdown & Post-flight:	As before, return control to the student after vacating the runway. All actions and checks should now be flowing well.

Flight Prompt Card

Ex 10b(iii): Stalling 3

AIREX:
1: REVISION: STUDENT PRACTICE of the 3 Test Stalls: Clean, Base Turn Config & Final App Config.
2: SECONDARY STALLS. DEMO/FT ONLY Sec Stall due insufficient CC movement. HASELL Cx, CH on, power to idle. Insufficient CC fwd at stall. NOTE: Secondary stall, Possible wing drop. No Practice.
3: SECONDARY DYNAMIC STALLS. DEMO/FT Sec Stall due to over-rapid recovery from dive. HASELL Cx, CH on, power to idle. At the stall CC centrally fwd. Demo rapid pitch up to induce secondary stall.
4: UNBALANCED YAW AT THE STALL. DEMO Only. HASELL Checks. Simulate after take-off with no rudder applied. Apply full power (NO RUDDER), keep pulling back until a/c stalls. Severe wing drop. CC Cent fwd. Level wings. Pull out of dive.
5: STUDENT PRACTICE of CORRECT recovery technique.
6: FULL SPIN (Optional). DEMO/PATTER Only with recovery.

Debriefing

- The take home message is still that the Standard Stall Recovery, if applied promptly and correctly will unstall the aeroplane.

Common Student Faults

To be added

Common Instructor Faults

- It can be difficult to produce these examples of ‘mishandled stall recovery’. A little practice is needed to be able to show the desired effects in your aircraft type.

Ex 11 – Spinning & Spin Avoidance

Practical Considerations

- Full spinning is not part of the EASA PPL (or LAPL) syllabus, neither is it part of the EASA FI course. However, the UK CAA has decided that all new instructors are to be examined on spinning in the AoC, and so the FIE will usually include spinning as one of the secondary exercises. As such, during an FI course, the trainee will learn how to teach the entry to and recovery from a spin. The FIC instructor will need to make mistakes in the entry and recovery to check that the trainee instructor has learnt correctly.
- Spin avoidance and recovery at the incipient stage of a spin are very much in the EASA PPL syllabus, and so during the stall training, attempts should be made to show students a wing drop at the stall, and how to recover from it.
- Most pilots embarking on an FI course will NEVER have seen a spin. In that case, that pilot must first be taught spinning, before being taught how to teach spinning. This can take several hours and may extend the hours needed to complete the course. Effectively, the FIC Instructor must both teach spinning, and then teach how to teach spinning. Some trainees may be apprehensive about the training, and others may suffer from airsickness.
- Ab-Initio spin training needs a careful look at Threat & Error Management. Some aircraft lose a lot of height in a fully developed spin. Also, during training, recoveries may be mishandled, resulting in further height loss. 4000-6000' should be viewed as a minimum height depending on aircraft type. Remember, unlike stalling, there is **NO STANDARD SPIN RECOVERY**! Many actions are similar, but the AFM/PoH must be consulted.
- The FI trainee may be doing the course on a non-spinnable aircraft. If this is the case, he may fly with an FIE in a spinnable aircraft and be assessed on the spinning part of the AoC. If the FIC Instructor conducting the course also has FIE privileges, then he may also carry out this function on a separate, dedicated flight. Any hours used with the FIE to sign off the spinning cannot be counted towards the 30 hours minimum.
- For the pre-flight briefing, make sure you have an aircraft model available and that you use it in the correct orientation relative to the student.
- This may need to be completed over more than one flight. The lesson should begin with HASELL+ checks followed by the demonstration of a full 3 turn spin and recovery. Then it is important to check the effect this has had on the student. It may be necessary to end the lesson at this point if reactions are adverse. Remember, the chances are, the student has never seen an aeroplane behave remotely like this before.
- The Cessna 172 is not a good aircraft for spinning: It does not want to spin and easily falls out from a spin if the controls are released. However, the best results may be obtained using the following method:
    - Set 1500-1700 rpm, raise the nose.
    - As the speed approaches 60-65 kts, abruptly apply full left rudder and hold the controls full back. Any release of the back pressure will cause the aircraft to recover prematurely.
    - During the recovery, do not release back pressure until after the opposite rudder has been applied.

HASELL+ Checks

Before spinning, it is a good idea to carry out an enhanced HASELL check.

A good horizon is necessary, the window should be clean and clear, and a good surface below (not 8/8 cloud or featureless sea). Normal HASELL checks can be upgraded to **HASELL+**, where the + part is:

- Clear Horizon
- Window Clear
- Surface below
- Safety Brief – Run through actions of both pilots, emergency brief, what happens if intercom is lost, what if student freezes?

Notes:

- Under Security in the HASELL checks, remember, before even starting the engine, make sure any loose articles are stowed or removed. It will be too late once in flight!
- If a student freezes on the controls and will not let go, hitting them in the throat will cause them to release their grip and raise their hands.
- The student may be flying in a different aircraft type to their normal trainer, since most are not cleared for intentional spinning. Make sure you teach them the aircraft differences on take-off and climb up to the training area.
- This topic may need to be completed over more than one flight.
- Do not attempt to talk to the student during the manoeuvre. On one of the demonstration spins, before entry, ask him to note the direction of spin from the TC and the airspeed. After the spin is complete, ask him what the values were. Many students are surprised by the high IAS (say 70 kts in a C152) and assume the aircraft cannot be stalled. Remember if the aircraft is descending at 3000 fpm, that is 30 kts downwards just from descent!
- During the spin demonstration, hold the pro-spin controls fully in, to maintain the spin. In a C152, releasing the controls will cause the aircraft to exit the spin.
- Remind the trainee that the spin may speed up before recovery. This is normal due to gyroscopic precession.
- The FIC AOC will always include teaching a spin.

Long Briefing

From EASA Part-FCL:

EXERCISE 11a: SPIN RECOVERY AT THE INCIPIENT STAGE
Long briefing objectives:
(1) causes, stages, autorotation and characteristics of the spin;
(2) recognition and recovery at the incipient stage: entered from various flight attitudes;
(3) aeroplane limitations.

EXERCISE 11b: SPIN RECOVERY AT THE DEVELOPED STAGE
Long briefing objectives:
(1) spin entry;
(2) recognition and identification of spin direction;
(3) spin recovery;
(4) use of controls;
(5) effects of power or flaps (flap restriction applicable to type);
(6) effect of the CG upon spinning characteristics;
(7) spinning from various flight attitudes;
(8) aeroplane limitation;
(9) safety checks.

Example Long Briefing

Spin Avoidance & Training in Cessna 152 Aircraft

Anatomy of a Spin

A spin cannot exist without both a stall and yaw.

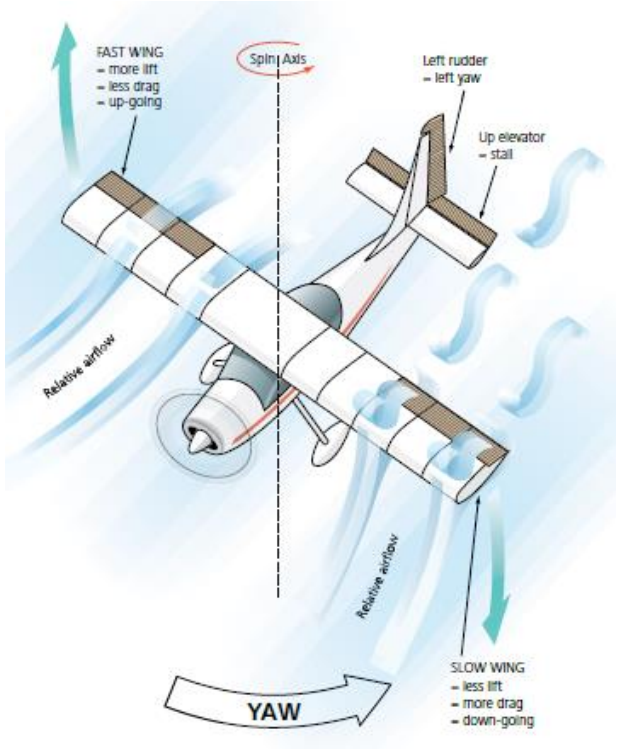
Stall

As a reminder, the stall angle of attack is the critical angle which, when exceeded, will cause the normally streamlined flow of air that follows the curvature of the upper wing surface to separate from the wing and leave as turbulent air flow.

Yaw

If the aircraft is yawed, a roll will develop in the direction of yaw as a secondary effect of that yaw. If this wing is at or near the stall angle, its lift reduces. When one wing goes down, the other will rise. The relative airflow now produces a reduction in angle of attack on the up-going wing, which may be below the stall angle (in effect it has become less stalled). The effect of these differences in lift will be to produce an accelerating roll rate in the direction of the initial yaw. These changing angles of attack also affect drag. The down-going wing with an increased angle of attack suffers increasing drag. The up-going wing gets a drag reduction. The difference causes even more yaw towards the down-going wing.

Autorotation



The yawed and stalled aircraft then starts to rotate. However, it not only rolls about the longitudinal axis due to the differences in lift from each wing, but also simultaneously rotates (yaws) about the vertical axis due to the differences in drag. The combination of these two movements gives us a new axis, the spin axis. The aircraft will continue in a self-perpetuating spin, or autorotation, about this axis until opposing forces come into play.

Causes of Yaw

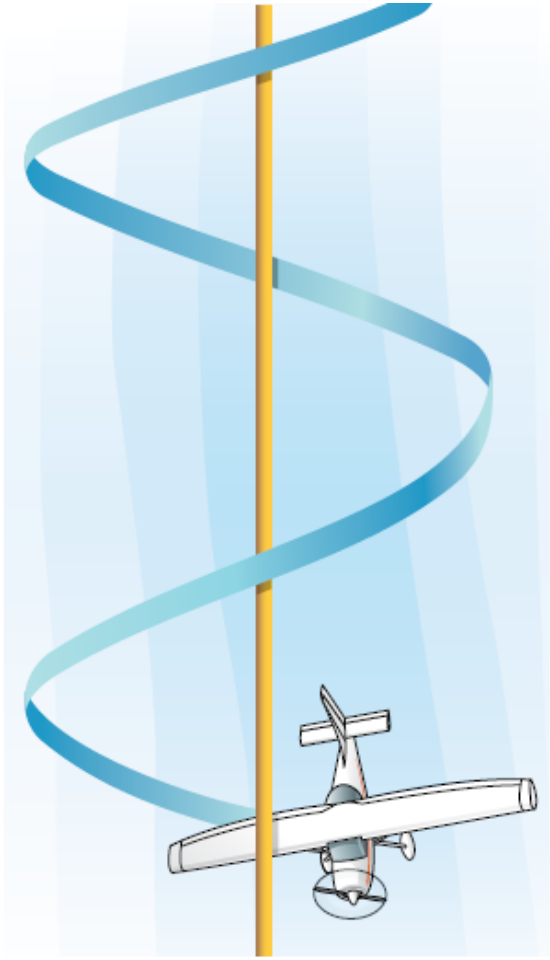
- Out of balance flight caused by inducing (or not preventing) yaw with rudder.
- Wing drop at the stall, due to rigging or dimensional differences between wings.
- Application of aileron will cause aileron drag. On some aircraft when stalled, this will produce yaw.
- Gyroscopic effect from the propeller when the aircraft is pitching with power on, such as falling out of an aerobatic manoeuvre. This effect is more pronounced in high-powered aircraft.
- Gusts.
- One wing producing more lift, due to ice or damage to a wing surface.
- Asymmetric power on twin-engine aeroplanes.

By far the most common cause of entry to an unintentional spin is the first of these – yaw at the stall caused by out-of-balance flight.

Spin Characteristics

The development and characteristics of a spin vary between aircraft types, but an aircraft will usually rotate several times before it settles down into a state of spinning steadily. The spin stabilizes once a complicated balance is reached between the various aerodynamic and inertial forces acting on the aircraft. The pitch angle it finally adopts may be steep (60 degrees or more with the nose low) or flat (nose on the horizon). The aircraft will lose altitude rapidly and descend along a vertical path about the spin axis. The rates of roll and yaw, and the pitch attitude, can all oscillate.

Spin characteristics vary depending on aircraft type, but even a given type of aircraft can have markedly changed spin characteristics depending on the aircraft weight, the aircraft centre of gravity, and how the controls (including engine power) are handled during the spin. A four-seat aircraft with docile stall and spin characteristics at training weights with 2 people on board can have very different characteristics at maximum all up weight with an aft centre of gravity due to people and baggage in the back.



An aircraft descends about its spin axis at a steep, nose low attitude.

The 3 Stages of a Spin

Incipient Stage

This is the transitional stage, during which the aircraft progresses from a fully developed stall into autorotation. This progression may be very rapid and is sometimes described as a flick. It may last only 2 turns, during which time the rotation tends to accelerate towards the rate found in the developed stage. The final balancing of aerodynamic and inertial forces has yet to occur. The incipient stage is generally driven by pilot inputs. As a very general rule, if pro-spin control inputs are removed in the incipient stage (the elevator is moved forward to unstall the wings, or the out-of balance yaw is removed), then the aircraft will not continue to enter a stable spin.

Developed Stage

In the developed stage, a state of equilibrium is reached, characterised by a low and constant airspeed. Rates of descent will be as high as 5000 to 8000 feet per minute. At this stage the spin will be self-perpetuating. If the pilot does nothing about it, the spin is likely to continue until the aircraft hits the ground. Positive anti-spin control inputs will be required to recover from the fully developed spin.

Recovery Stage

Spinning ceases only if and when opposing forces and moments overcome auto-rotation. Since yaw coupled with roll powers the spin, the pilot must forcibly uncouple them by applying full opposite rudder. After a brief pause, this is followed by forward movement on the stick or control column. During the recovery phase, the nose attitude typically steepens and the rate of rotation may momentarily accelerate as well, giving the impression that the spin is actually getting worse. It is not, and the anti-spin control inputs must be maintained until the spin stops.

Spin recovery is not instantaneous. It may take up to several turns for the anti-spin control inputs to finally overcome pro-spin forces. The longer an aircraft is in a spin, the more turns it may take to recover. Spins are recoverable only when the cumulative effects of the interacting variables favour recovery and there is enough altitude.

Avoiding Spins

Prevention is better than cure. The following situations can cause a spin.

Low-speed Climbing Turns
The aircraft is already vulnerable by being at low speed and in a nose-up attitude and therefore close to the stall. Low-energy, low-powered aeroplanes in this situation will suffer some performance loss during a turn. If this is not compensated for by lowering the nose, the speed will further diminish. Turning – or even the application of aileron – may give the required yaw to precipitate the spin.

Skidding Turn on to Final
Consider a late turn on to final approach, overturning the centre line, particularly on a glide or forced-landing approach, or in a crosswind. If any attempt is made to correct the situation by increasing rudder in the direction of the turn without increasing bank, this coupled with a reducing or low airspeed will result in a skidding turn, and will provide all the ingredients needed to start a spin. The low altitude will preclude the chance of recovery.

False Visual Horizons
Flying in hilly terrain may distort the visual cues needed to ascertain both the pitch and roll attitudes of the aircraft. It is easy to allow airspeed to reduce further than anticipated. When combined with a turn, particularly in confined areas, this can produce stall and yaw, the two components needed for a spin.

Engine Failure After Takeoff
In a high nose-up attitude, with high power and low speed, the immediate priority is to lower the nose and preserve existing airspeed. In most cases, there is little option but to land ahead. Attempting a turn back to the runway or to a limited selection of landing areas will provide the G loading to increase the stall speed. Any yaw will now put the aeroplane into the incipient spin situation.

Spin Recovery
To have a chance at recovery, the pilot must immediately recognise the spin, and its direction, know exactly what to do in the right order, and then execute the procedure correctly the first time. In most aircraft there is little time to do all this. The minimum altitude loss for a text-book recovery will be about 1000 to 1500 feet.

Direction of Spin
Problems can occur in determining spin direction due to extreme disorientation and shock/surprise. The spin (yaw) direction will always be correctly indicated by the turn needle of the TC. The ball cannot be trusted. It is likely to be centrifuged away from the centre of the aeroplane and its reaction may depend on where it is mounted on the aircraft in relation to the centre of gravity.

Recovery Technique

Spin recovery does not follow a pilot's natural instincts.

Incipient Spin
Recovery from an incipient spin (a spin that has just started) requires instant recognition, an immediate check forward on the stick or control column (to unstall the wing) and sufficient opposite rudder to eliminate yaw and further wing drop. This must be instinctive. Be wary of pitching forward too much.

Developed Spin
In a developed spin, full deflection of controls is required. Although there is no universal spin recovery technique, the one from the Cessna 152 PoH is shown below.

Cessna 152 Spin Recovery (From PoH)

Should an inadvertent spin occur, the following recovery procedure should be used:

1. **Place ailerons in neutral position**
2. **Close the throttle.**
3. **Apply and hold full opposite rudder against the direction of rotation.**
4. **Just after the rudder reaches the stop, move the elevator control briskly forward far enough to break the stall.** (Full down elevator may be required at aft C of G.)
5. **Hold these inputs until the spin stops.** (Premature relaxation of the inputs may extend the recovery)
6. **As the rotation stops, neutralise rudder, and make a smooth recovery from the resulting dive.**

NOTE: If disorientation precludes visual determination of the direction of rotation, the symbolic airplane in the turn coordinator may be referred to for this information.

Board Briefing

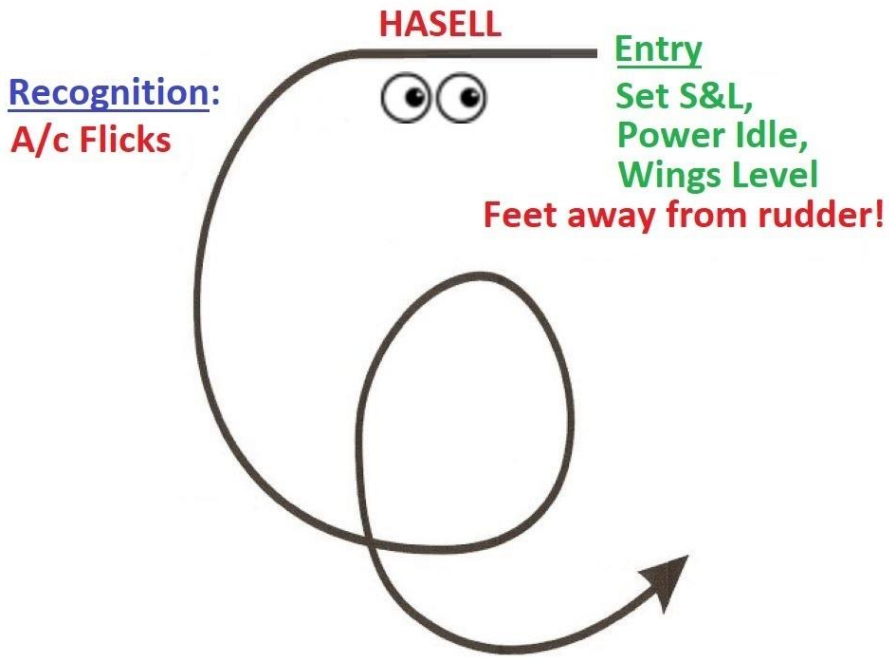
Ex 11: 11a: Spin Avoidance & 11b: Full Spinning

03Jan23

AIM: **a:** To learn to recognise and recover from a spin at the incipient stage. **b:** To learn how to recover from a fully developed spin.
T&E: Other a/c, Envelope, Terrain and obstacles, Engine overheat, Loose articles, Personal injury, Loss of control.
M: HASELL Checks, W&B, Pre-Flight Planning, Learn Spin Recovery Technique from PoH/AFM.

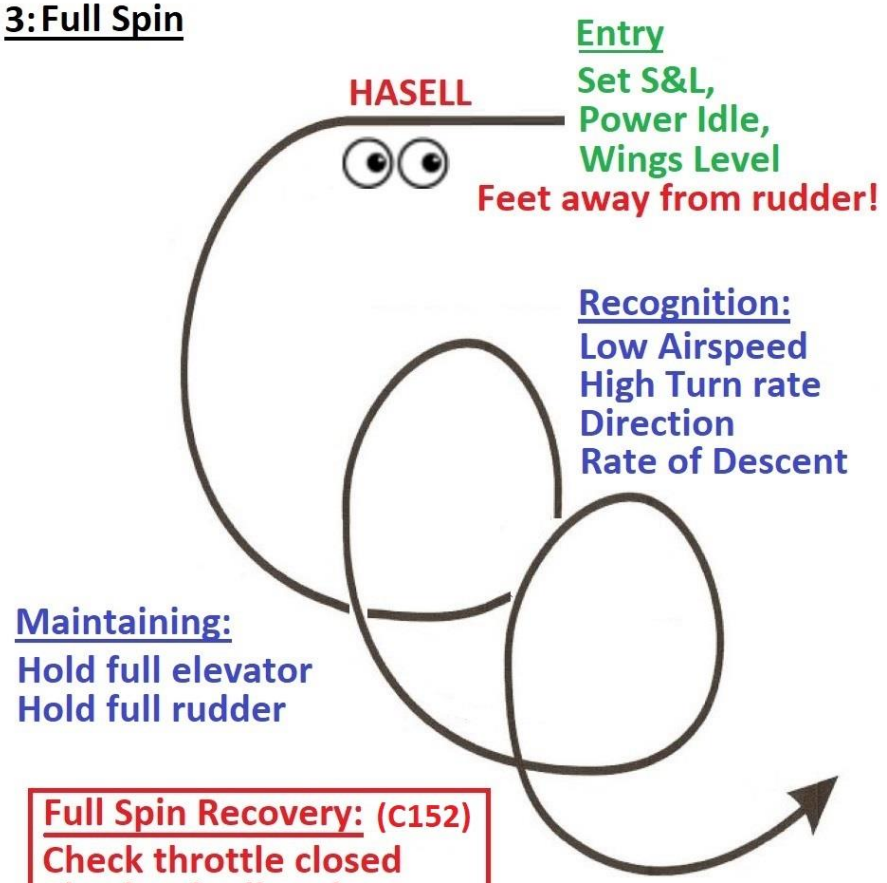
Airex: **1:** Revision: Stalling

2: Incipient Spin



Spin Recovery at Incipient Stage
Centralise Controls
When rotation stops - Recover
If it doesn't stop - Full Spin Recovery!

3: Full Spin



Full Spin Recovery: (C152)
Check throttle closed
Check spin direction
Full opposite rudder
C.C. centrally fwd
Centralise rudder
Ease out of dive

No Standard Spin Recovery exists!!!

Skeleton Board Briefing

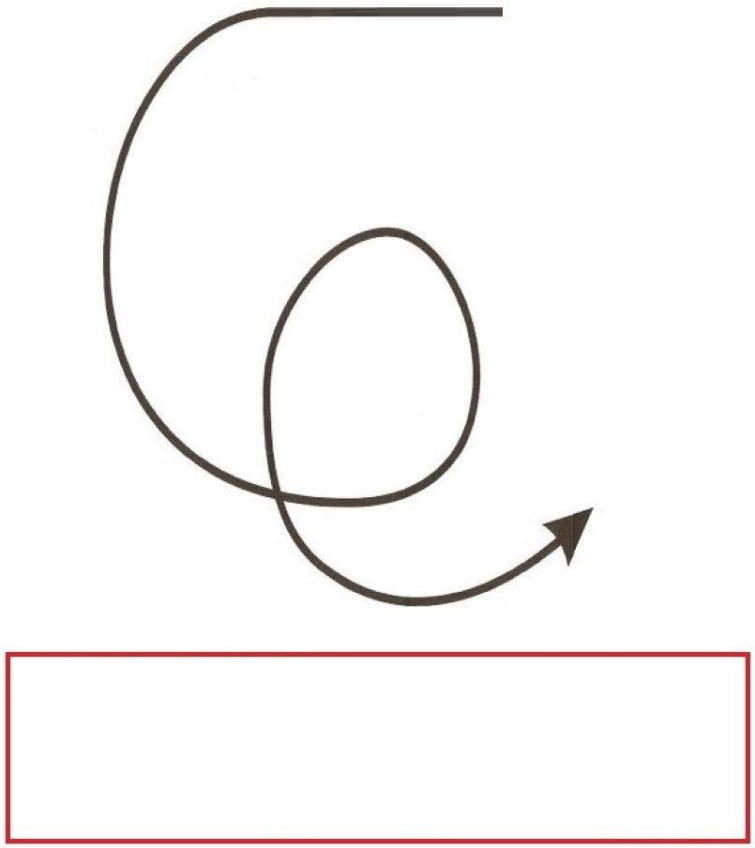
Ex 11: 11a: Spin Avoidance & 11b: Full Spinning

03Jan23

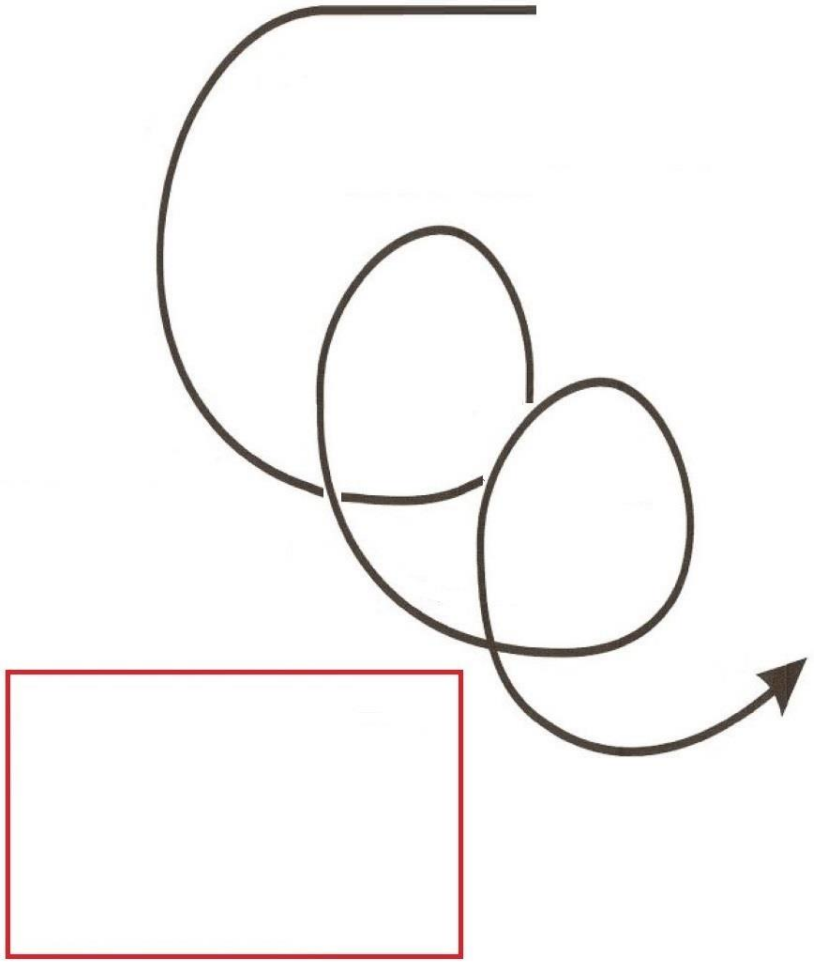
AIM: **a:** To learn to recognise and recover from a spin at the incipient stage. **b:** To learn how to recover from a fully developed spin.
T&E:
M:

Airex: **1:** Revision:

2: Incipient Spin



3: Full Spin



Inadvertent Spin This humorous video shows a full spin in a Cessna 152 (internet connection required)

Air Exercise (Lesson Points correspond to the numbers in the Flight Prompt Cards)

On the Ground:	The student should now need no assistance or prompting to get the aircraft as far as lining up on the runway for your take-off.
Take-Off:	As before, carry out the take-off while the student observes. Use the checklist and ask the student to make the radio calls. Handover control shortly after take-off to allow revision of climbing and turning.
Lesson Point 1:	**STUDENT PRACTICE** of climbing into the local area to a suitable altitude (say 3000').
Lesson Point 2:	'We are now at 5000' in the local area. I am going to demonstrate an incipient spin to you. I just want you to watch what is happening.' Carry out a HASELL+ check. 'I pick a feature in the distance, put the carb heat ON and reduce the power to 1800 rpm (or as required) and maintain altitude. There is the stall warner. I keep maintaining altitude.' Make no attempt to keep the aircraft in balance. You want a wing drop to occur. Recover as the wing drop gets to 45-60^{o} angle of bank, and before a spin develops by 'Power OFF – Centralise'. 'There is a wing drop, so Power OFF – Centralise controls. Did you notice how the wing dropped when the aircraft stalled? If we had let that develop, the aircraft would have gone into a spin. So, to recover before a spin develops, we use: Power OFF – Centralise. Are you feeling OK? Are you happy to continue?'
Lesson Point 3:	'I'd like you to practice recovering at the incipient stage of the spin. You have control.' **STUDENT PRACTICE**.
Lesson Point 4:	'We are now at 5000' in the local area. I am going to demonstrate an full spin to you. I just want you to watch what is happening.' Carry out a HASELL+ check. 'I put the carb heat ON and reduce the power to 1500 rpm (or as required) and maintain altitude. There is the stall warner. At 55 kts I apply full up elevator and full rudder left or right. Notice the aircraft spinning. Note the low airspeed. Note the Turn Co-ordinator showing my direction of spin. After 3 turns: I am now ready to recover: Power off, flaps up, full opposite rudder. Control column centrally forward until the spin stops. Ease out of the dive. Did you notice the airspeed? Are you feeling OK?

Lesson Point 5:	'Now, I'd like you to practice setting up and recovering from a full spin. You have control.' **STUDENT PRACTICE**. Practice as required. It is acceptable at this stage to coach the student through entering and recovering from the spin.
Approach & Landing:	As before, the student should be able to fly the rejoin, making all radio calls, as far as final. Take over and land, pattering the last part of the approach and landing.
After Landing, Shutdown & Post-flight:	As before, return control to the student after vacating the runway. All actions and checks should now be flowing well.

Flight Prompt Card

Ex 11a: Spinning (Recovery at Incipient)

AIREX:
1: REVISION Climbing.
2: INCIPIENT SPIN. HASELL+ Cx. Reduce power ~1800 rpm. Gradually apply back pressure without maintaining balance. Stall the a/c. Wing will drop. Wait until wing drops 45-60º before recovery:
'POWER OFF-CENTRALISE!'
3: STUDENT PRACTICE.

Ex 11b: Spinning (Full)

AIREX:
4: FULL 3 turn SPIN & RECOVERY: DEMO ONLY HASELL+ Checks. CH on, power 1500 rpm. Maintain altitude. At 55 kts, apply full rudder and hold CC fully back. NOTE: Airspeed & Direction of spin on TC.

C152 SPIN RECOVERY: •Identify direction of spin •Throttle closed •Flaps UP •Full Opposite Rudder •CC Cent Fwd until spin stops •Centralise rudder •Ease out of dive gently

5: STUDENT PRACTICE.

Debriefing

- Make sure the student knows the incipient recovery : Power OFF – Centralise as well as the spin recovery for the aircraft type in use.

Common Student Faults

- During a spin in a Cessna 152 or 172, it is important to keep FULL rudder and FULL back pressure on until ready to recover.

Common Instructor Faults

- Try not to refer to the 'Incipient Spin Recovery'. The phrase 'Recovery at the Incipient Stage' is better.
- Recovery at the incipient stage tends to be fast and there is not much time to patter. The phrase '**Power Off -Centralise**!' usually does the trick.
- Do not forget to point out the low and fluctuating airspeed, direction of turn on the TC/TI and the rate of turn and descent during the spin. Point out how these are different to a spiral dive.
- Make sure that in the recovery, the first action is to reduce the power to idle, otherwise the spin will flatten, and the dive after recovery will be faster.
- During a spin in a Cessna 152 or 172, it is important to keep FULL rudder and FULL back pressure on until ready to recover.

Ex 12 - Takeoff and Climb to Downwind

Practical Considerations

- Ex 12 is usually combined with Ex 13 and called 'Ex 12&13: Circuits'.
- For the pre-flight briefing, make sure you have an aircraft model available and that you use it in the correct orientation relative to the student.
- Spacing in the circuit can often cause problems. Remember, the best leg to take action on is the climbout. If there is traffic close ahead, extending the climbout (where permitted) can be an effective solution.

Long Briefing

From EASA Part-FCL:

Long briefing objectives:
(1) handling: factors affecting the length of take-off run and initial climb;
(2) correct lift off speed, use of elevators (safeguarding the nose wheel), rudder and power;
(3) effect of wind (including crosswind component);
(4) effect of flaps (including the decision to use and the amount permitted);
(5) effect of ground surface and gradient upon the take-off run;
(6) effect of mass, altitude and temperature on take-off and climb performance;
(7) pre take-off checks;
(8) ATC procedure before take-off;
(9) drills, during and after take-off;
(10) noise abatement procedures;
(11) tail wheel considerations (as applicable);
(12) short or soft field take-off considerations or procedures;
(13) emergencies: (i) aborted take-off; (ii) engine failure after take-off.
(14) ATC procedures.

Board Briefing

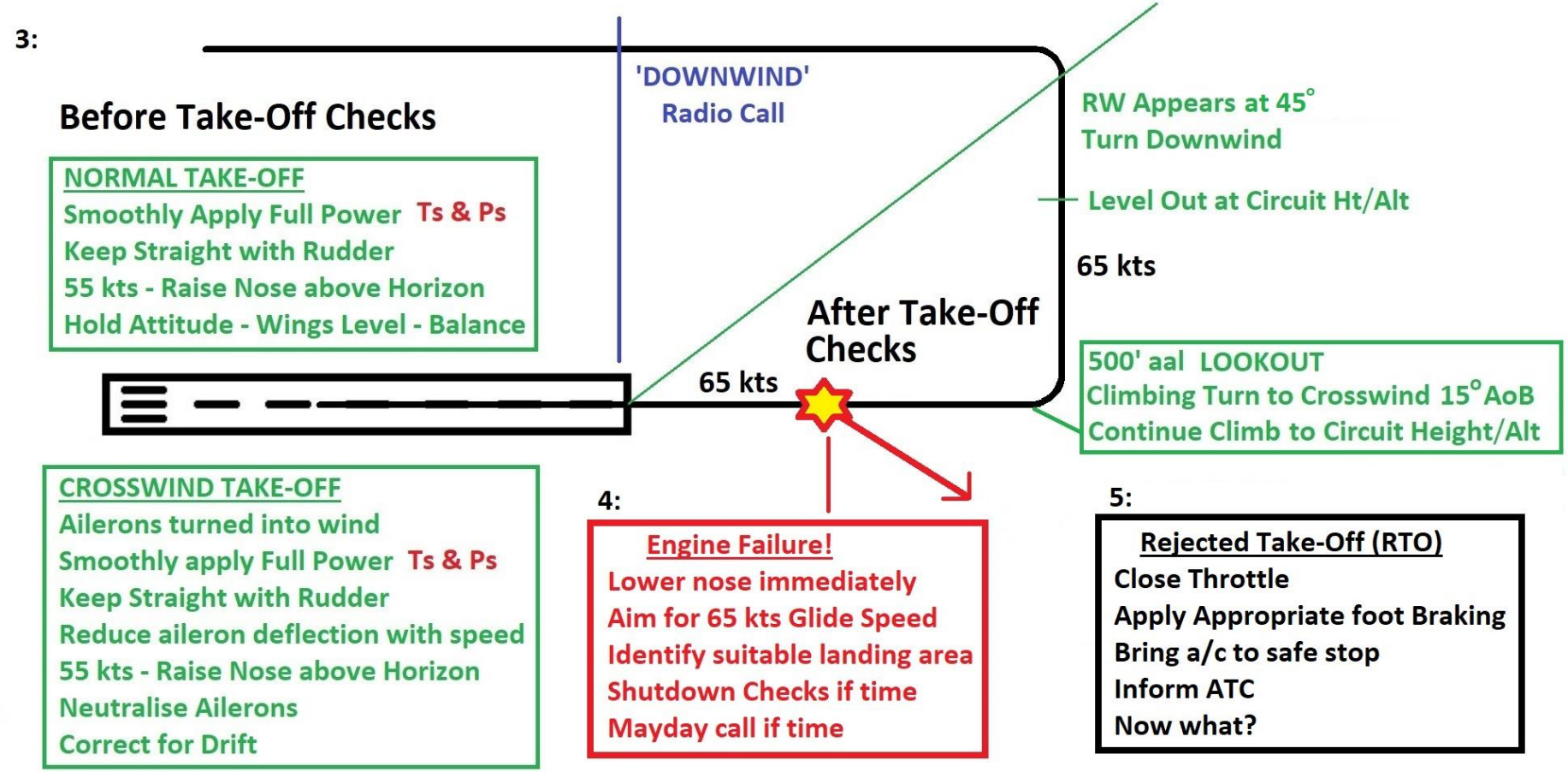
Ex 12: TAKE-OFF & CLIMB TO DOWNWIND POSITION

28Feb22

AIM: To learn to take-off and fly a normal circuit to the downwind position. To learn how to handle an Engine Failure after Take-Off (EFATO) and RTO.
T&E: Other a/c, Engine overheat, Wake Turbulence, Take-Off w/o clearance
M: Lookout, Ts & Ps, Perf Calculation, Good RT

AIREX: 1: Demonstrate Take-Off to Downwind

2: Take-Off and Climb to Downwind



Skeleton Board Briefing

Ex 12: TAKE-OFF & CLIMB TO DOWNWIND POSITION

28Feb22

AIM: To learn to take-off and fly a normal circuit to the downwind position. To learn how to handle an Engine Failure after Take-Off (EFATO) and RTO.

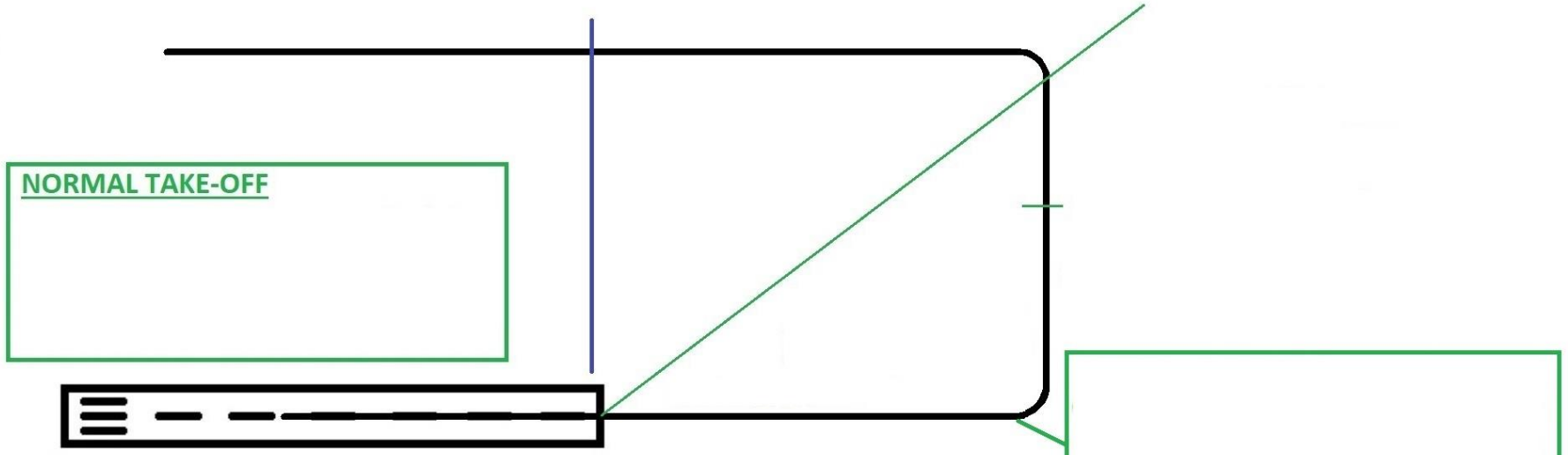
T&E:

M:

AIREX: 1:

2:

3:



4:

Engine Failure!

5:

Rejected Take-Off (RTO)

Air Exercise (Lesson Points correspond to the numbers in the Flight Prompt Cards)

Lesson Point 1:	**Revision:** The student will need no assistance or prompting to get the aircraft as far as lining up on the runway. Make sure there is a suitable gap in traffic to allow an unhurried take-off.
Lesson Point 2:	By now, the student has seen you demonstrate and patter several take-offs, and is now more than ready to try for themselves. However, if it has been a while since the last lesson, the demonstration/patter of a full circuit may be helpful. 'Here we, stopped are on the runway centreline with all the checks completed and take-off clearance received. I want you to follow me through as I teach you the take off. My heels on the floor and I have one hand on the throttle and the other hand holding the yoke neutral (or ailerons into wind). I check the heading on the DI is correct for the runway and smoothly apply full power. I want you to look at the far end of the runway. I use the rudder pedals to keep the aircraft straight along the runway. As speed starts to increase, I check that the airspeed is increasing on the ASI and the Ts & Ps are in the green. Then I look only outside at the far end of the runway, keeping one hand on the throttle and the yoke neutral. As the speed reaches 55 kts, I move the control column rearwards until the nose rises and then hold the attitude, adjusting to the normal climbing attitude.' Then round the circuit, pattering until landing and vacating. Taxy back to the holding point.
Lesson Point 3:	'Here we, stopped short of the runway. When I give you control, I want you to line up, carry out all necessary checks and take off when cleared. You have control.' **STUDENT PRACTICE.** Ideally you should remain silent and not coach the student during the take-off, but as things happen quite quickly, the odd helpful remark may be needed, such as 'more right rudder pedal', 'more back pressure' etc.
Lesson Point 4:	Once the climbing attitude has been established: 'Check the ASI to make sure you are climbing at 65 kts and check the ball is in the middle – you will need right rudder pedal. Look over your shoulder to check you are climbing straight out (in aircraft with rear windows!).
Lesson Point 5:	'Now as you reach 500', a good lookout and then a 15 degree banked climbing turn to the left/right. As you approach circuit height, level out in the normal way.'
Lesson Point 6:	'Look out the rear window, and as you see the runway appear 45 degrees over your shoulder (or as required locally), start a 30 degree banked level turn onto the downwind leg. Make sure you are tracking parallel to the runway.'
Lesson Point 7:	'I have control.' Demonstrate (with follow through) and patter the remainder of the circuit and landing. Vacate and taxy back to the holding point.
Lesson Point 8:	'Here we are again, short of the runway. When I give you control, I want you to line up, carry out all necessary checks and take off again when cleared. You have control.' **STUDENT PRACTICE.**

Lesson Point 9:	Once proficient at take-offs, it is time to introduce the Engine Failure After Take-Off (EFATO) drills. Once the student has demonstrated a good take-off: 'I have control. I now want you to follow me through as I demonstrate the engine failure after take-off drills.' At a safe altitude (400' agl) turn ON the carb heat and close the throttle. 'Engine Failure! I now lower the nose towards the descending attitude and maintain 65kts glide speed, controlling with elevator. I look forwards for a suitable landing site. That large green field will do. I check out seat belts are secure and if time permits carry out any shutdown checks. I now go-around.' Demonstrate (with follow through) and patter the remainder of the circuit and landing. Vacate and taxy back to the holding point.
Lesson Point 10:	'Here we are again, short of the runway. When I give you control, I want you to line up, carry out all necessary checks and take off again when cleared. You have control.' **STUDENT PRACTICE.** At a safe altitude (400' agl) turn ON the carb heat and close the throttle.
Lesson Point 11:	Once proficient at take-offs, it is time to introduce the Rejected Take-Off (RTO). Once lined up on the runway with no traffic to affect: 'I have control. I now want you to follow me through as I demonstrate the rejected take-off procedure.' I start a normal take-off. Heels on the floor, smoothly add full power, looking at the far end of the runway. Temperatures and pressures are good. No airspeed!! I am going to stop. I close the throttle, apply braking with my feet and keep looking outside. Once stopped, I call '*G-AB stopped on the runway*'. I need to decide what to do next. Lack of airspeed is not a life threatening situation, so I will taxy clear of the runway. *'G-AB vacating*''' Vacate the runway and taxy back to the holding point.
Lesson Point 12:	'Here we are again, short of the runway. When I give you control, I want you to line up, carry out all necessary checks and begin a take-off when cleared. You have control.' **STUDENT PRACTICE.** At a suitable speed (40 kts) point out something wrong that will require an RTO. Oil temp/pressure anomaly, smoke/fire from the engine etc, but noting that will require the student to use excessive braking (such as a blocked runway ahead).
After Landing, Shutdown & Post-flight:	The student may vacate the runway and carry out all checks and radio calls. All actions and checks should now be flowing well.

Flight Prompt Card

Ex 12: Take-Off & Climb to Downwind

AIREX:
1: REVISION:
Start-Up, TAXY, Run-Up, Checks. T/O Brief.
2: IF REQD DEMO/FT normal take-off. Land & taxi back.
3: STUDENT PRACTICE take-off roll & rotate.
4: STUDENT PRACTICE climbout.
5: STUDENT PRACTICE turn crosswind & level out.
6: STUDENT PRACTICE turn to downwind.
7: DEMO/FT Circuit to land, taxi back.
8: STUDENT PRACTICE take-off. Repeat as reqd.
9: DEMO/FT EFATO drills. Land, taxi back. Repeat.
10: STUDENT PRACTICE
11: DEMO/FT RTO drills. Taxi back. Repeat
12: STUDENT PRACTICE.

Debriefing

- During the EFATO, students frequently underestimate the amount of forward pitch required to go from climbing at 65 kts to gliding at 65 kts. Make sure they make a positive effort to pitch forward.

Common Student Faults

- Before the students begins a take-off roll, say ‘heels on the floor’ and look down to see that they are. Otherwise you may feel braking inputs during take-off.
- Students frequently do not hold right rudder during the take-off roll, leading to a close encounter with the left hand runway edge.
- Students sometimes overcontrol on the rudder pedals during take-off.
- Once airborne, if there is a crosswind, many students fail to maintain the runway centreline. In some aircraft you can point out of the rear window to highlight this problem. Otherwise, make sure they have a feature ahead and to the left that they can use.
- During the EFATO, students frequently underestimate the amount of forward pitch required to go from climbing at 65 kts to gliding at 65 kts. Make sure they make a positive effort to pitch forward.

Common Instructor Faults

To be added

Ex 13 - Circuit, Approach and Landing

Practical Considerations

- Ex 13 is usually combined with Ex 12 and called 'Ex 12&13: Circuits'.
- For the pre-flight briefing, make sure you have an aircraft model available and that you use it in the correct orientation relative to the student.
- This exercise is often best started away from the airfield using a runway shaped field (or disused runway). It allows the student to learn the procedures without the worry of other traffic and radio calls.
- A good way to start landings is to fly a circuit to a go-around. Subsequent circuits can be planned for a go around, but if the aircraft is well placed, then a landing can be attempted. This way, there is no feeling of failure if a go-around occurs.
- Introduce the concept of a 'stabilised approach'. Ask the student on each approach if they are stabilised. If not, they should know to carry out a go-around. Discourage orbits in the circuit. Teach go-arounds from downwind and base legs as well as from final.
- Much debate surrounds the teaching of the final approach. There are 2 camps into which instructors fall: The '*elevator controls airspeed*' group and the '*point and power*' group. The elevator controls airspeed method is fairly easy to understand – elevator controls airspeed and power controls rate of descent. Point and power involves pointing the aircraft towards the aiming point on the runway and using power to control the airspeed. Point and power is slowly gaining popularity as it is more useful in larger aircraft and instrument flying.

Long Briefing

From EASA Part-FCL:

Long briefing objectives:

(1) downwind leg, base leg & approach: position & drills;
(2) factors affecting the final approach & landing run;
(3) effect of mass;
(4) effects of altitude and temperature;
(5) effect of wind;
(6) effect of flap;
(7) landing;
(8) effect of ground surface and gradient on landing run;
(9) types of approach and landing:
(i) powered;
(ii) crosswind;
(iii) flapless (at an appropriate stage of the course);
(iv) glide;
(v) short field;
(vi) soft field.
(10) tail wheel aeroplane considerations (as applicable);
(11) missed approach;
(12) engine handling;
(13) wake turbulence awareness;
(14) windshear awareness;
(15) ATC procedures;
(16) mislanding and go-around;
(17) special emphasis on look-out.

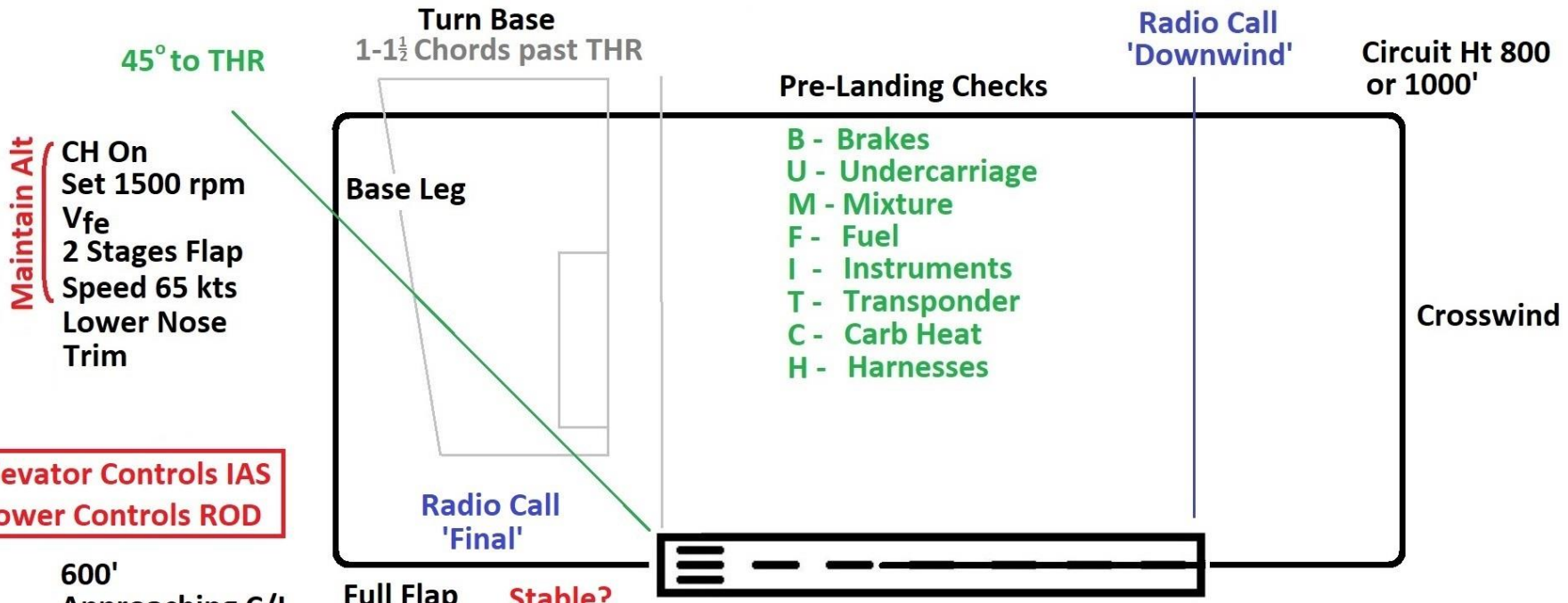
Board Briefing

Ex 13: Circuit, Approach and Landing

28Feb22

AIM: To learn to fly a normal circuit, approach and landing from the downwind position.
T&E: Other a/c, Engine overheat, wake turbulence, Infringement, Flap overspeed, Unstable approach, RW Excursion, Carb icing.
M: Lookout, Pre-Landing Cx, V_{fe}, Carb Heat, Stabilised Approach Criteria or Go-around.

Airex: 1: Demo Circuit. 2: Take-off + Climb to Downwind. 3: Normal Take-off, Circuit, Approach + Landing



Skeleton Board Briefing

Ex 13: Circuit, Approach and Landing

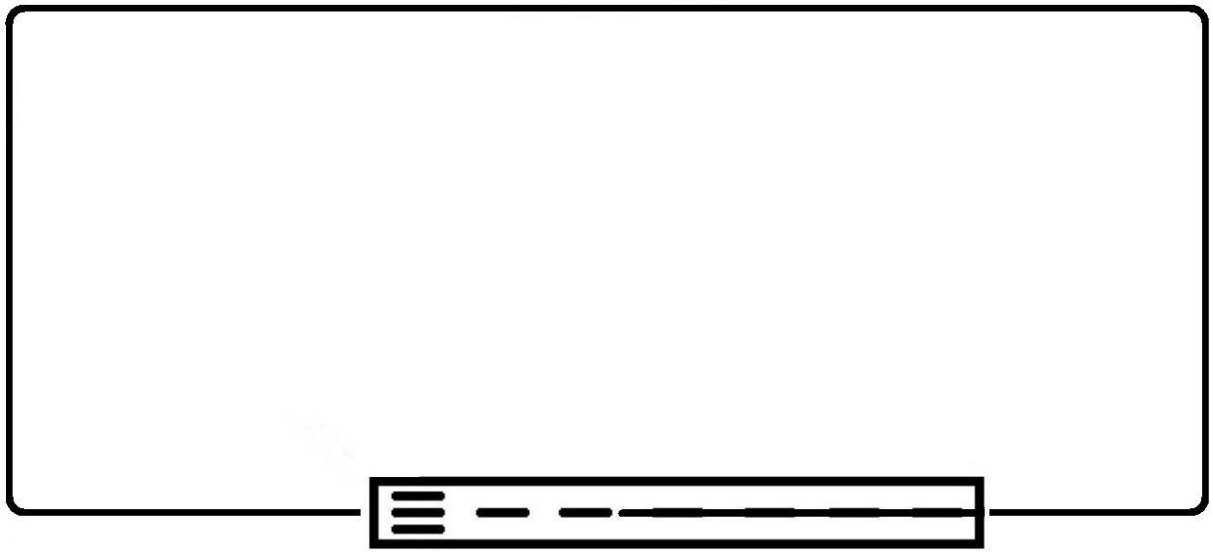
28Feb22

AIM: To learn to fly a normal circuit, approach and landing from the downwind position.

T&E:

M:

Airex:



4: _____ **5:** _____

6: _____

Air Exercise (Lesson Points correspond to the numbers in the Flight Prompt Cards)

Lesson Point 1:	**Revision:** The student will need no assistance or prompting to get the aircraft as far as lining up on the runway. Make sure a take-off brief is given. Allow the student to take-off and once on downwind leg:
Lesson Point 2:	'I have control. Follow me through. Here we are on downwind leg. First I make my call '*G-AB downwind for a go-around*'. Then I carry put my pre-landing checks: Brakes are off, mixture is rich, fuel is sufficient for a go-around, Instruments set, carb heat checked, temperatures & pressures checked, transponder set, seat belts secure. As the runway gets to 45 degrees over my shoulder I begin to turn onto base leg. Good lookout, balanced turn onto base. Now I put the carb heat on, reduce power to about 1500 rpm and maintain my circuit altitude. Holding the back pressure as the speed reduces. Once in the white arc, I select 2 stages of flap, still maintaining my altitude. As the speed reaches 65 kts, I lower the nose and trim. I now maintain 65 kts with elevator. Looking for any traffic on long final – none seen. Looking at the runway and judging my height. If I am too high I will reduce power. If I am too low I will add power. Now turning onto final. Using the runway numbers as my aiming point. Pointing the aircraft towards the numbers and controlling my speed with the throttle. I select full flap and reduce to 60 kts. Controlling speed with the throttle. Only small corrections now. Looking only at the runway (to gauge my height) and ASI to check my speed. Runway – Airspeed. Runway – Airspeed. I plan to go-around at 200'. '*G-AB on final for a go-around*'. As I approach 200', carb heat off, full power, nose up. Remove the drag flap and climb away. Positive rate of climb and speed above 65 kts – remove one stage of flap. Positive rate of climb and speed above 65 kts – remove last stage of flap. '*G-AB, going around*'.'
Lesson Point 3:	Once clean in the climbout: 'I want you to practice the approach and go-around at 200'. 'You have control.' **STUDENT PRACTICE.**
Lesson Point 4:	Once on downwind leg after several successful approaches and go-arounds. As before demonstrating with follow through, but this time to a touch and go. 'Now turning onto final. Using the runway numbers as my aiming point. Pointing the aircraft towards the numbers and controlling my speed with the throttle. I select full flap and reduce to 60 kts. Controlling speed with the throttle. Only small corrections now. Looking only at the runway (to gauge my height) and ASI to check my speed. Runway – Airspeed. Runway – Airspeed. '*G-AB on final touch and go*'. I keep the aircraft coming down making small corrections. Looking at the runway numbers and the ASI. As I approach the numbers, I look at the far end of the runway, close the throttle and try to maintain level flight. Gradually increasing the back pressure, holding the aircraft off the ground. As soon as we touch down, I urn off the carb heat, retract all the flap and apply full power. Looking at the far end of the runway. As the airspeed reaches 55 kts I rotate into the climbing attitude.'

Lesson Point 5:	'I want you to practice the circuit and approach. If the approach is not stable at 200' I want you to go-around. If the approach is stable I will instruct you to land. 'You have control.' **STUDENT PRACTICE several approaches.**
After Landing, Shutdown & Post-flight:	The student may vacate the runway and carry out all checks and radio calls. All actions and checks should now be flowing well.

Flight Prompt Card

Ex 13: Circuit, Approach & Landing

AIREX:
1: REVISION: Start-Up, TAXI, Run-Up, Checks, Take-Off Brief, Take-Off to downwind.
2: From downwind. DEMO/FT App & G/A.
3: STUDENT PRACTICE several approaches to G/A.
4: DEMO/FT App & Ldg from Downwind.
5: STUDENT PRACTICE several approaches to G/A or T&G as dictated by stability.

Debriefing

- This is a busy lesson for the student. A debrief of the main points will help them to remember the key points. Encourage the student to 'armchair fly' at home to consolidate the procedures.

Common Student Faults

- On final, students sometimes have their attention focussed on all manner of things, such as the altimeter. The only things they should be concerned with are the runway and the ASI. Saying '**Runway – ASI**' repeatedly can be helpful.
- Student often become nervous approaching the ground and an otherwise good approach can begin to level out as the students gets 'fear of the ground'. Gently use the words 'keep it coming down'. This will relax the student and should bring about the desired effect.

Common Instructor Faults

- Do not be tempted to let the student land from an unstable approach. Practice of stable approaches and go-arounds are just as useful, and eventually a stable approach will present itself for landing practice.

Ex 12 & 13 - Circuits

Practical Considerations

- Ex 12 and 13 are usually combined and called 'Circuits'. This particular section will deal with 'normal landings' only – that is with the normal land flap selected.
- There is a lot of material in this lesson, and it is fully expected that it will be divided up into a number of flight lessons.
- This combined exercise contains no new 'building blocks'. It is an amalgamation of previously learned skills, and it is the putting of all these skills together in a busy circuit that causes most problems – workload management.
- For the pre-flight briefing, make sure you have an aircraft model available and that you use it in the correct orientation relative to the student.
- This exercise is often best started away from the airfield using a runway shaped field (or disused runway). It allows the student to learn the procedures without the worry of other traffic and radio calls.
- A good way to start landings is to fly a circuit to a go-around. Subsequent circuits can be planned for a go around, but if the aircraft is well placed, then a landing can be attempted. This way, there is no feeling of failure if a go-around occurs.
- Introduce the concept of a 'stabilised approach'. Ask the student on each approach if they are stabilised. If not, they should know to carry out a go-around. They should not be waiting for you to call 'go around'.
- Spacing in the circuit can often cause problems. Remember, the best leg to take action on is the climbout. If there is traffic close ahead, extending the climbout (where permitted) can be an effective solution. Discourage orbits in the circuit. Teach go-arounds from downwind and base legs as well as from final.
- The patter used in this section involves 'point and power' once on final approach. This can be changed to 'elevator controls airspeed if needed'.
- Variant circuits are also covered in this lesson, such as flapless, glide, bad-weather and short field circuits to land which have been labelled 13b, 13c, 13d & 13e respectively.

Long Briefing

Not required for this lesson as there are no new concepts to be introduced.

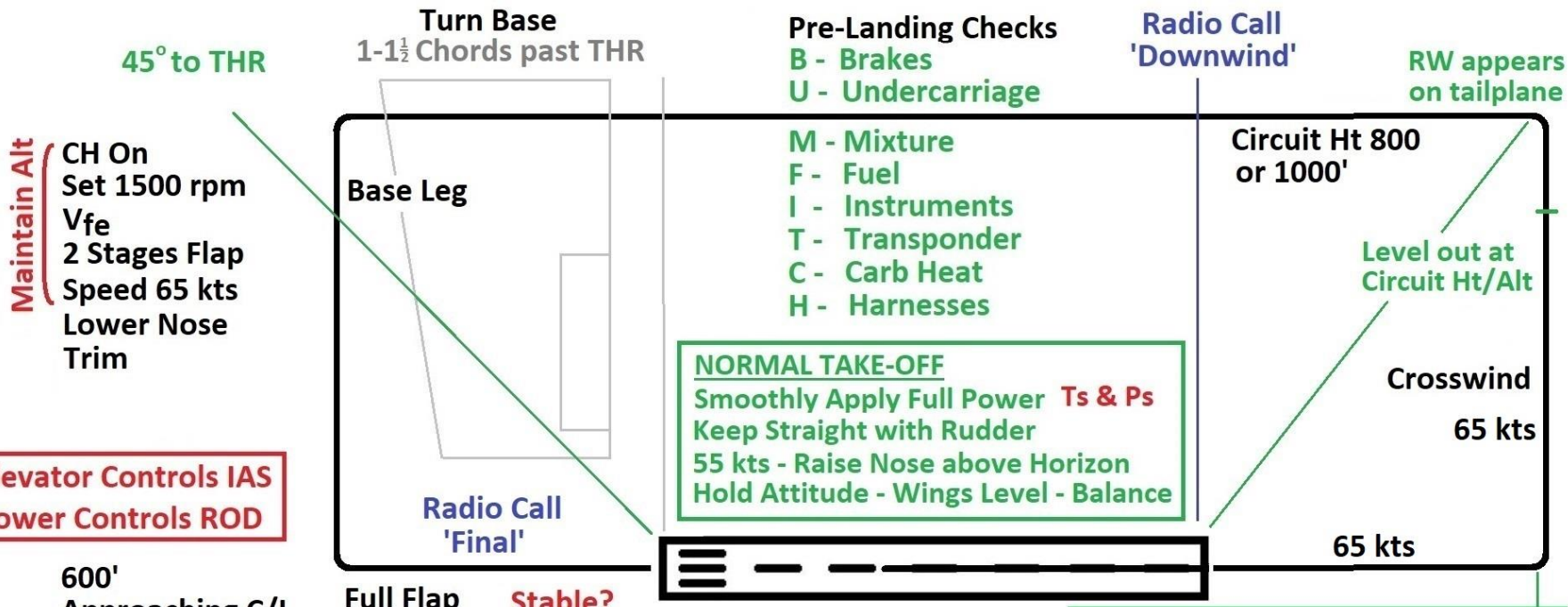
Board Briefing

Ex 12+13a: Normal Circuits

28Feb22

AIM: To learn to fly a normal take-off, circuit, approach and landing.
T&E: Other a/c, Engine overheat, wake turbulence, Infringement, Flap overspeed, Unstable approach, RW Excursion, Carb icing.
M: Lookout, Pre-Landing Cx, V_{fe}, Carb Heat, Stabilised Approach Criteria or Go-around.

Airex: 1: Demo Circuit. 2: Take-off + Climb to Downwind. 3: Normal Take-off, Circuit, Approach + Landing



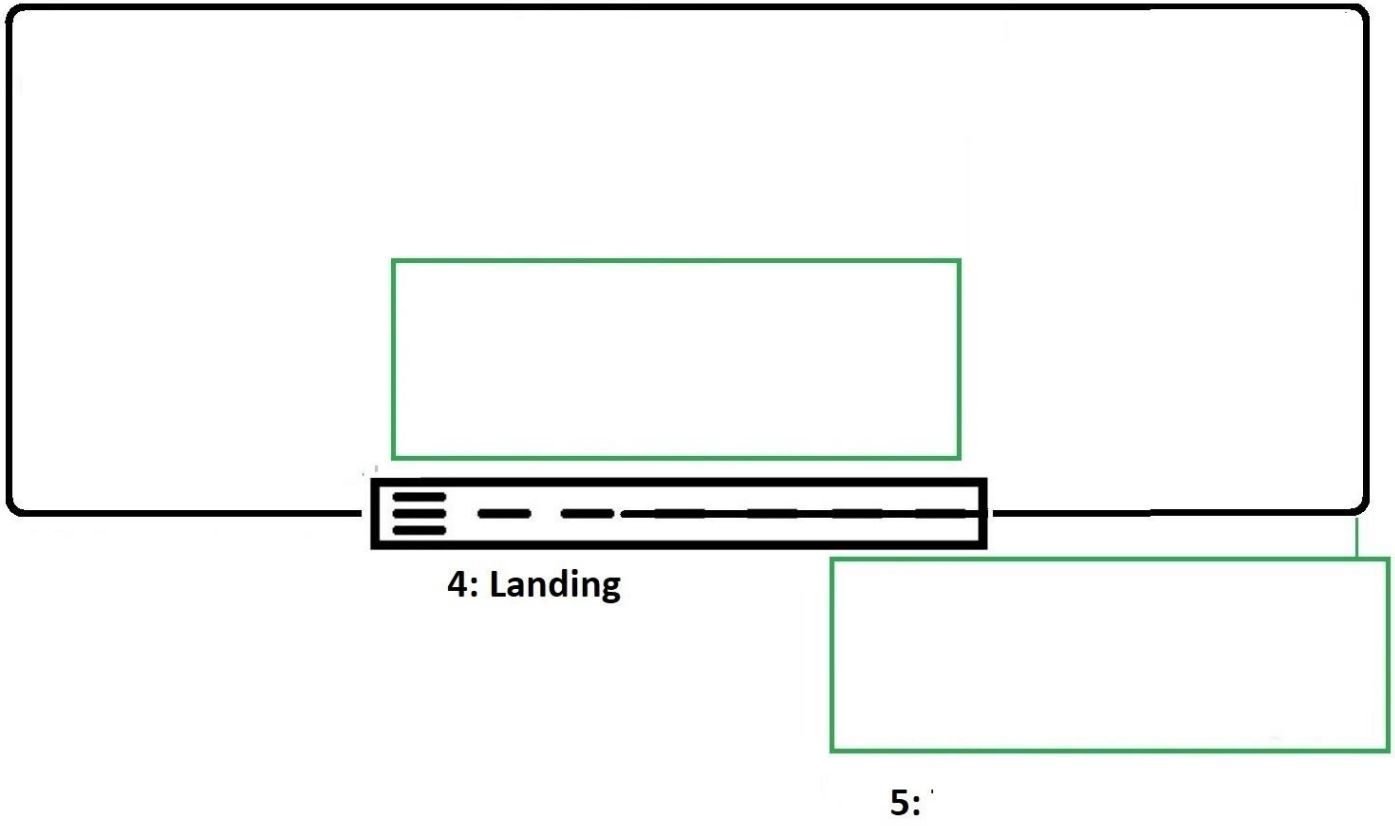
Skeleton Board Briefing

Ex 12+13a: Normal Circuits

28Feb22

AIM: To learn to fly a normal take-off, circuit, approach and landing.
T&E:
M:

Airex:



Air Exercise (Lesson Points correspond to the numbers in the Flight Prompt Cards)

Lesson Point 1:	**Revision:** The student will need no assistance or prompting to get the aircraft as far as lining up on the runway. Make sure there is a suitable gap in traffic to allow an unhurried take-off.
Lesson Point 2:	By now, the student has seen you demonstrate and patter several take-offs, and is now more than ready to try for themselves. However, if it has been a while since the last lesson, the demonstration/patter of a full circuit may be helpful. 'Here we, stopped are on the runway centreline with all the checks completed and take-off clearance received. I want you to follow me through as I teach you the take off. My heels on the floor and I have one hand on the throttle and the other hand holding the yoke neutral (or ailerons into wind). I check the heading on the DI is correct for the runway and smoothly apply full power. I want you to look at the far end of the runway. I use the rudder pedals to keep the aircraft straight along the runway. As speed starts to increase, I check that the airspeed is increasing on the ASI and the Ts & Ps are in the green. Then I look only outside at the far end of the runway, keeping one hand on the throttle and the yoke neutral. As the speed reaches 55 kts, I move the control column rearwards until the nose rises and then hold the attitude, adjusting to the normal climbing attitude.' Then round the circuit, pattering until landing and vacating. Taxy back to the holding point.
Lesson Point 3:	'Here we, stopped short of the runway. When I give you control, I want you to line up, carry out all necessary checks and take off when cleared. You have control.' **STUDENT PRACTICE.** Ideally you should remain silent and not coach the student during the take-off, but as things happen quite quickly, the odd helpful remark may be needed, such as 'more right rudder pedal', 'more back pressure' etc.
Lesson Point 4:	Once the climbing attitude has been established: 'Check the ASI to make sure you are climbing at 65 kts and check the ball is in the middle – you will need right rudder pedal. Look over your shoulder to check you are climbing straight out (in aircraft with rear windows!).
Lesson Point 5:	'Now as you reach 500', a good lookout and then a 15 degree banked climbing turn to the left/right. As you approach circuit height, level out in the normal way.'
Lesson Point 6:	'Look out the rear window, and as you see the runway appear 45 degrees over your shoulder (or as required locally), start a 30 degree banked level turn onto the downwind leg. Make sure you are tracking parallel to the runway.'
Lesson Point 7:	'I have control.' Demonstrate (with follow through) and patter the remainder of the circuit and landing. Vacate and taxy back to the holding point.
Lesson Point 8:	'Here we are again, short of the runway. When I give you control, I want you to line up, carry out all necessary checks and take off again when cleared. You have control.' **STUDENT PRACTICE.**

Lesson Point 9:	'I have control. Follow me through. Here we are on downwind leg. First I make my call '*G-AB downwind for a go-around*'. Then I carry put my pre-landing checks: Brakes are off, mixture is rich, fuel is sufficient for a go-around, Instruments set, carb heat checked, temperatures & pressures checked, transponder set, seat belts secure. As the runway gets to 45 degrees over my shoulder I begin to turn onto base leg. Good lookout, balanced turn onto base. Now I put the carb heat on, reduce power to about 1500 rpm and maintain my circuit altitude. Holding the back pressure as the speed reduces. Once in the white arc, I select 2 stages of flap, still maintaining my altitude. As the speed reaches 65 kts, I lower the nose and trim. I now maintain 65 kts with elevator. Looking for any traffic on long final – none seen. Looking at the runway and judging my height. If I am too high I will reduce power. If I am too low I will add power. Now turning onto final. Using the runway numbers as my aiming point. Pointing the aircraft towards the numbers and controlling my speed with the throttle. I select full flap and reduce to 60 kts. Controlling speed with the throttle. Only small corrections now. Looking only at the runway (to gauge my height) and ASI to check my speed. Runway – Airspeed. Runway – Airspeed. I plan to go-around at 200'. '*G-AB on final for a go-around*'. As I approach 200', carb heat off, full power, nose up. Remove the drag flap and climb away. Positive rate of climb and speed above 65 kts – remove one stage of flap. Positive rate of climb and speed above 65 kts – remove last stage of flap. '*G-AB, going around*'.'
Lesson Point 10:	Once clean in the climbout: 'I want you to practice the approach and go-around at 200'. 'You have control.' **STUDENT PRACTICE.**
Lesson Point 11:	Once on downwind leg after several successful approaches and go-arounds. As before demonstrating with follow through, but this time to a touch and go. 'Now turning onto final. Using the runway numbers as my aiming point. Pointing the aircraft towards the numbers and controlling my speed with the throttle. I select full flap and reduce to 60 kts. Controlling speed with the throttle. Only small corrections now. Looking only at the runway (to gauge my height) and ASI to check my speed. Runway – Airspeed. Runway – Airspeed. '*G-AB on final touch and go*'. I keep the aircraft coming down making small corrections. Looking at the runway numbers and the ASI. As I approach the numbers, I look at the far end of the runway, close the throttle and try to maintain level flight. Gradually increasing the back pressure, holding the aircraft off the ground. As soon as we touch down, I turn off the carb heat, retract all the flap and apply full power. Looking at the far end of the runway. As the airspeed reaches 55 kts I rotate into the climbing attitude.'
Lesson Point 12:	'I want you to practice the circuit and approach. If the approach is not stable at 200' I want you to go-around. If the approach is stable I will instruct you to land. You have control.' **STUDENT PRACTICE several approaches.**

Lesson Point 13:	Once proficient at take-offs, it is time to introduce the Engine Failure After Take-Off (EFATO) drills. Once the student has demonstrated a good take-off: 'I have control. I now want you to follow me through as I demonstrate the engine failure after take-off drills.' At a safe altitude (400' agl) turn ON the carb heat and close the throttle. 'Engine Failure! I now lower the nose towards the descending attitude and maintain 65kts glide speed, controlling with elevator. I look forwards for a suitable landing site. That large green field will do. I check out seat belts are secure and if time permits carry out any shutdown checks. I now go-around.' Demonstrate (with follow through) and patter the remainder of the circuit and landing. Vacate and taxy back to the holding point.
Lesson Point 14:	'Here we are again, short of the runway. When I give you control, I want you to line up, carry out all necessary checks and take off again when cleared. You have control.' **STUDENT PRACTICE.** At a safe altitude (400' agl) turn ON the carb heat and close the throttle.
Lesson Point 15:	Once proficient at take-offs, it is time to introduce the Rejected Take-Off (RTO). Once lined up on the runway with no traffic to affect: 'I have control. I now want you to follow me through as I demonstrate the rejected take-off procedure.' I start a normal take-off. Heels on the floor, smoothly add full power, looking at the far end of the runway. Temperatures and pressures are good. No airspeed!! I am going to stop. I close the throttle, apply braking with my feet and keep looking outside. Once stopped, I call '*G-AB stopped on the runway*'. I need to decide what to do next. Lack of airspeed is not a life threatening situation, so I will taxy clear of the runway. *'G-AB vacating*''' Vacate the runway and taxy back to the holding point.
Lesson Point 16:	'Here we are again, short of the runway. When I give you control, I want you to line up, carry out all necessary checks and begin a take-off when cleared. You have control.' **STUDENT PRACTICE.** At a suitable speed (40 kts) point out something wrong that will require an RTO. Oil temp/pressure anomaly, smoke/fire from the engine etc, but noting that will require the student to use excessive braking (such as a blocked runway ahead).
After Landing, Shutdown & Post-flight:	The student may vacate the runway and carry out all checks and radio calls. All actions and checks should now be flowing well.

Flight Prompt Card

Ex 12&13: Take-Off, Circuit, App & Ldg

AIREX:
1: REVISION:
Start-Up, TAXY, Run-Up, Checks. T/O Brief.
2: IF REQD DEMO/FT normal take-off. Land & taxi back.
3: STUDENT PRACTICE take-off roll & rotate.
4: STUDENT PRACTICE climbout.
5: STUDENT PRACTICE turn crosswind & level out.
6: STUDENT PRACTICE turn to downwind.
7: DEMO/FT Circuit to land, taxi back.
8: STUDENT PRACTICE take-off. Repeat as reqd.
9: From downwind. DEMO/FT App & G/A.
10: STUDENT PRACTICE several approaches to G/A.
11: DEMO/FT App & Ldg from Downwind.
12: STUDENT PRACTICE several approaches to G/A or T&G as dictated by stability.
13: DEMO/FT EFATO drills. Land, taxi back. Repeat.
14: STUDENT PRACTICE
15: DEMO/FT RTO drills. Taxi back. Repeat
16: STUDENT PRACTICE.

Debriefing

- During the EFATO, students frequently underestimate the amount of forward pitch required to go from climbing at 65 kts to gliding at 65 kts. Make sure they make a positive effort to pitch forward.
- This is a busy lesson for the student. A debrief of the main points will help them to remember the key points. Encourage the student to 'armchair fly' at home to consolidate the procedures.

Common Student Faults

- Before the students begins a take-off roll, say ‘heels on the floor’ and look down to see that they are. Otherwise you may feel braking inputs during take-off.
- Students frequently do not hold right rudder during the take-off roll, leading to a close encounter with the left hand runway edge.
- Students sometimes overcontrol on the rudder pedals during take-off.
- Once airborne, if there is a crosswind, many students fail to maintain the runway centreline. In some aircraft you can point out of the rear window to highlight this problem. Otherwise, make sure they have a feature ahead and to the left that they can use.
- During the EFATO, students frequently underestimate the amount of forward pitch required to go from climbing at 65 kts to gliding at 65 kts. Make sure they make a positive effort to pitch forward.
- On final, students sometimes have their attention focussed on all manner of things, such as the altimeter. The only things they should be concerned with are the runway and the ASI. Saying ‘**Runway – ASI**’ repeatedly can be helpful.
- Student often become nervous approaching the ground and an otherwise good approach can begin to level out as the students gets ‘fear of the ground’. Gently use the words ’keep it coming down’. This will relax the student and should bring about the desired effect.

Common Instructor Faults

- Do not be tempted to let the student land from an unstable approach. Practice of stable approaches and go-arounds are just as useful, and eventually a stable approach will present itself for landing practice.

Ex 13b – Flapless Approach & Landing

Practical Considerations

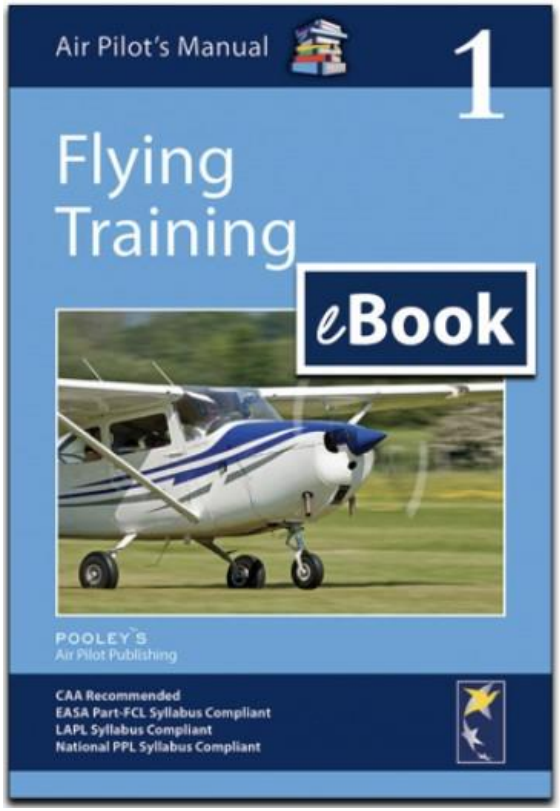
- Ex 12 and 13 are usually combined and called 'Circuits'.
- The student should be competent at normal circuits before moving onto flapless.
- The take-off and climb to downwind is identical to that for a normal circuit, so no need to demonstrate that.

Long Briefing

- A brief discussion of the reasons why a flapless landing might be necessary is useful.
- A discussion of the differences that can be expected from a normal approach.

Suggested Long Brief

The Air Pilot's Manual Vol 1 published by Pooley's provides excellent material for the long brief.



Exercise 13d

The Flapless Approach and Landing

Aim

To approach and land without the use of flaps.

Considerations

A flapless approach will be necessary if a failure of any part of the flap system occurs (a rare event), and is advisable in strong and gusty winds. Crosswind landings are often made in such conditions.

Compared to a normal approach and landing with flap, the main features of a flapless approach and landing are:

- **a flatter flightpath** (but not normally below a 3° approach) requiring an extended circuit;
- **a higher approach speed** (due to the higher stalling speed);
- **a higher nose attitude** and poorer forward vision;
- **almost no round-out** and a longer float (due to less drag) if the hold-off is prolonged before the aeroplane touches down;
- **a risk of scraping the tail** if the nose is raised too high on touchdown; and
- a longer landing run.

It is most important to control the flightpath and airspeed fairly tightly on a flapless approach. As usual, airspeed is controlled with elevator and flightpath with power. If too high, reduce power and lower the nose slightly – if the power is already at idle, consider a sideslip to increase the rate of descent and lose height.

A 'clean' wing has less drag than a flapped wing, which means that excess speed takes longer to 'wash-off', i.e. a flapless aeroplane is 'slippery'. This can lengthen the hold-off and float considerably. To avoid using too much runway and also to avoid the risk of scraping the tail, do not prolong the hold-off, particularly on a short runway.

Once the nosewheel is on the ground, brakes can be used if required.

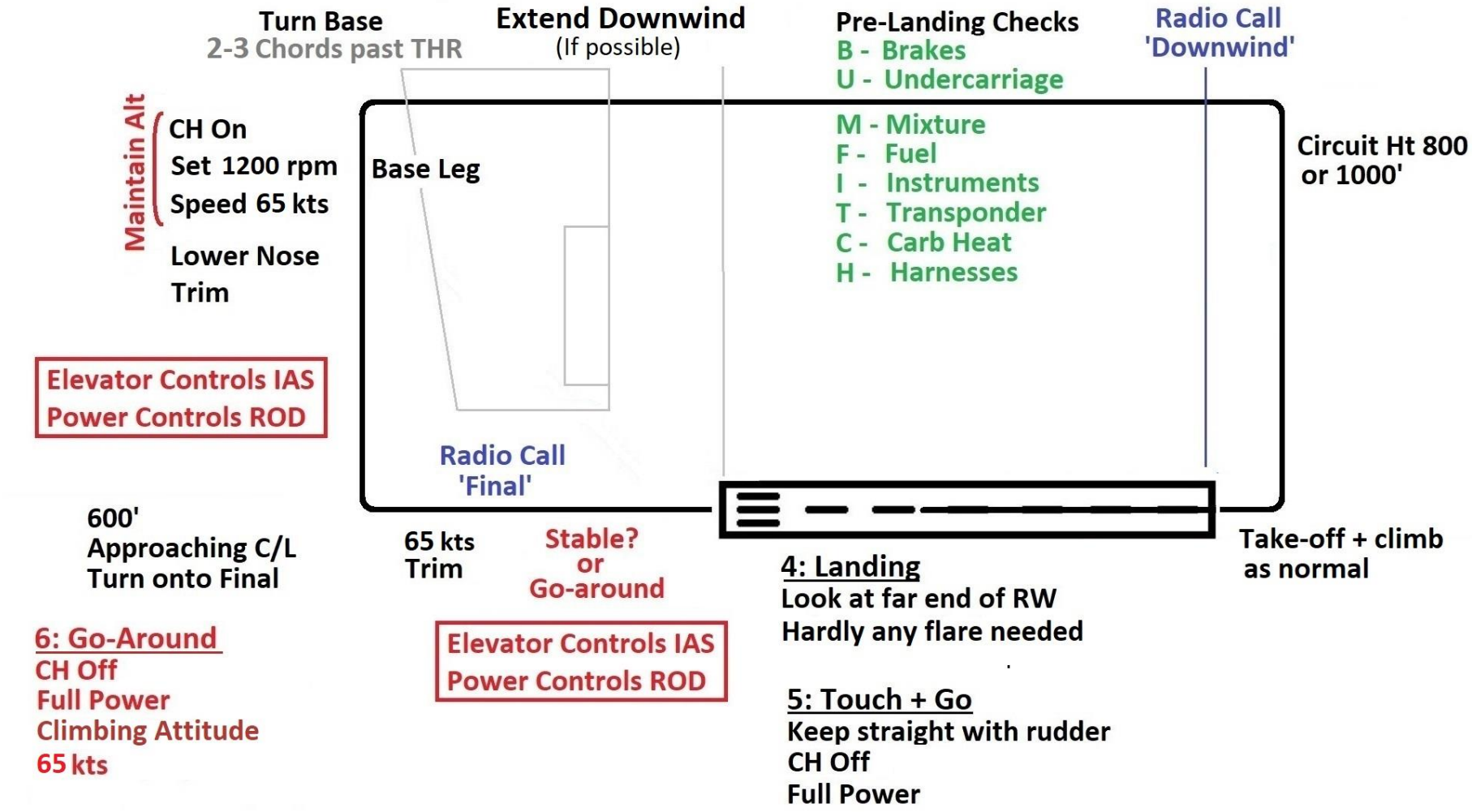
Board Briefing

Ex 13b: Flapless Approach + Landing

28Feb22

AIM: To learn to approach and land without the use of flaps.
T&E: Other a/c, Engine overheat, wake turbulence, Infringement, Unstable approach, RW Excursion, Carb icing.
M: Lookout, Pre-Landing Cx, Carb Heat, Stabilised Approach Criteria or Go-around.

Airex: 1: Take-off + Climb to Downwind. 2: DEMO Flapless Approach + Landing. 3: Flapless Circuits.



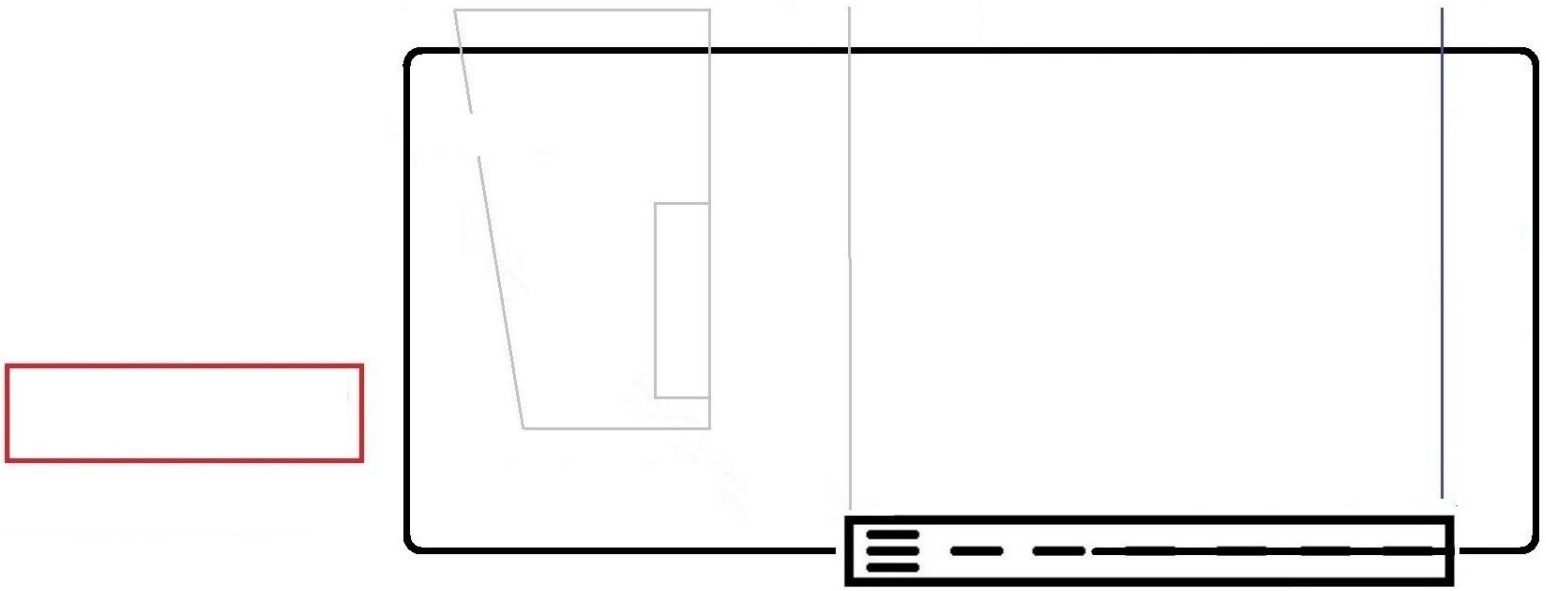
Skeleton Board Briefing

Ex 13b: Flapless Approach + Landing

28Feb22

AIM: To learn to approach and land without the use of flaps.
T&E:
M:

Airex: 1: **2:** **3:**



4: Landing

6: _____

5: Touch + Go

Air Exercise (Lesson Points correspond to the numbers in the Flight Prompt Cards)

Lesson Point 1:	**Revision:** The student will need no assistance or prompting to get the aircraft as far as lining up on the runway and taking off. Once on downwind leg:
Lesson Point 2:	'I have control. Follow me through as I demonstrate a flapless approach and go-around. Here we are on downwind leg. First I make my call '*G-AB downwind for a go-around*'. Then I carry put my pre-landing checks. I can expect getting the aircraft to descend will be a little harder. The aircraft will be fast to accelerate, but slow to decelerate. The picture on final approach will look different, with the runway lower in the windscreen. When I come to flare, the aircraft will almost be in the touchdown attitude, so less of a flare is required. Due to the lack of drag from the flap, the aircraft is likely to float. As the runway gets to 45 degrees over my shoulder I extend a little if I can, and then begin to turn onto base leg. Good lookout, balanced turn onto base. Now I put the carb heat on, reduce power to about 1500 rpm and maintain my circuit altitude. Holding the back pressure as the speed reduces. As the speed reaches 65 kts, I lower the nose and trim. I now maintain 65 kts with elevator. Looking for any traffic on long final. Looking at the runway and judging my height. If I am too high I will reduce power. If I am too low I will add power. Now turning onto final. Using the runway numbers as my aiming point. Notice the higher nose attitude making it harder to see the aiming point. Pointing the aircraft towards the numbers and controlling my speed with the throttle. Speed control is harder than with flaps due to the lack of drag. I plan to go-around at 200'. As I approach 200', carb heat off, full power and rotate into the climbing attitude. You have control'
Lesson Point 3:	'I want you to practice the circuit, approach and go-around without the use of flaps. You have control.' **STUDENT PRACTICE several flapless approaches followed by go-around.**
Lesson Point 4:	Later on final: 'Pointing the aircraft towards the numbers and controlling my speed with the throttle. Only small corrections now. Looking only at the runway (to gauge my height) and ASI to check my speed. Runway – Airspeed. Runway – Airspeed. As I approach the numbers, I look at the far end of the runway, close the throttle and try to maintain level flight. We are almost in the landing attitude, so not much back pressure is needed. Hold the aircraft off the ground and expect a float. As soon as we touch down, I turn off the carb heat and apply full power, keeping straight with rudder. Looking at the far end of the runway. As the airspeed reaches 55 kts I rotate into the climbing attitude.'
Lesson Point 5:	'Now, I want you to fly a flapless circuit and approach. If the approach is not stable at 200' I want you to go-around. If the approach is stable I want you to land. You have control.'
After Landing, Shutdown & Post-flight:	The student may vacate the runway and carry out all checks and radio calls. All actions and checks should now be flowing well.

Flight Prompt Card

Ex 13b: Flapless Circuit & Landing

AIREX:
1: REVISION: Student take-off to downwind.
2: DEMO/FT/TEACH flapless approach & go-around.
3: STUDENT PRACTICE.
4: DEMO/FT/TEACH flapless approach & landing.
5: STUDENT PRACTICE.

Debriefing

The main debrief points are

- the difficulty in losing height,
- the different picture on approach,
- the much smaller flare required,
- the harder it will be to control the airspeed on approach
- the increased possibility of a float.

Common Student Faults

- Without the use of flap, the student may struggle to get the aircraft to descend, especially in light wind conditions. This is why the downwind leg may be extended and/or less power is used on base leg.
- On the final approach, without flaps, the aircraft is almost in the landing attitude already. Therefore very little flare is needed. If too much flare is used, the aircraft will float or balloon. Call for a go-around.

Common Instructor Faults

- It is common to hear instructors telling students that a flapless approach is flown much flatter and at a lower glidepath than a normal approach with full flap. This is mistaken. Although the attitude of the aircraft on final approach is more nose up, the actual profile of the approach is the same. This is very important if there are obstacles under the approach.

Ex 13c – Glide Approach & Landing

Practical Considerations

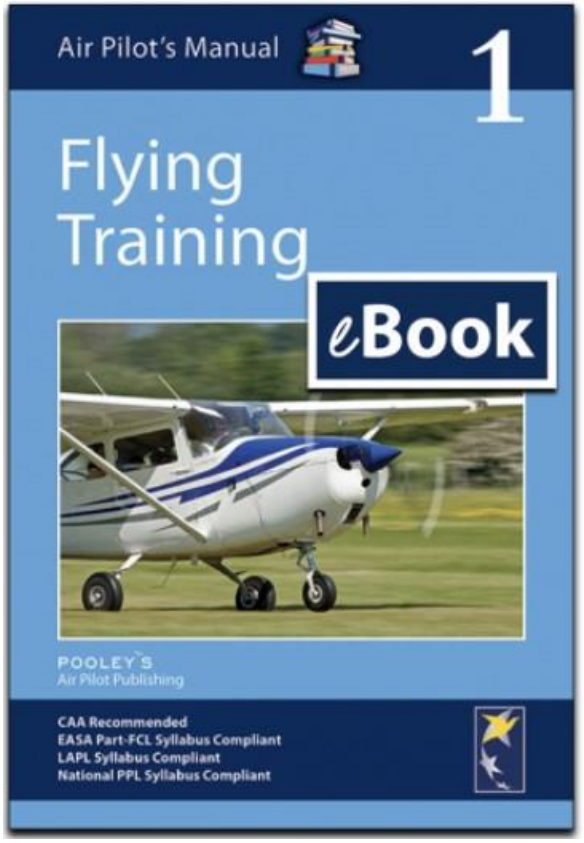
- Ex 12 and 13 are usually combined and called ‘Circuits’.
- The student should be competent at normal circuits before moving onto this lesson.

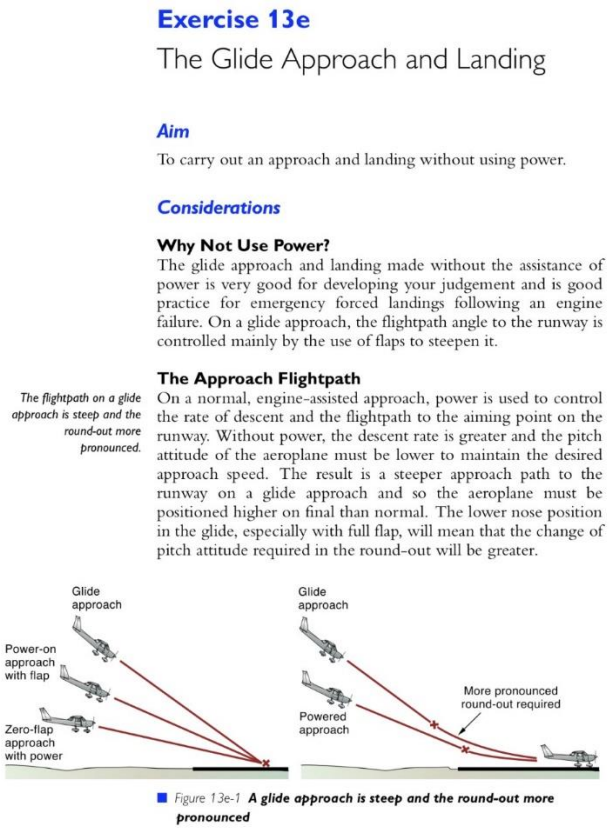
Long Briefing

- A brief discussion of the reasons why a glide approach and landing might be necessary is useful.
- A discussion of the differences that can be expected from a normal approach.

Suggested Long Brief

The Air Pilot’s Manual Vol 1 published by Pooley’s provides excellent material for the long brief.





Exercise 13e

The Glide Approach and Landing

Aim

To carry out an approach and landing without using power.

Considerations

Why Not Use Power?

The glide approach and landing made without the assistance of power is very good for developing your judgement and is good practice for emergency forced landings following an engine failure. On a glide approach, the flightpath angle to the runway is controlled mainly by the use of flaps to steepen it.

The Approach Flightpath

The flightpath on a glide approach is steep and the round-out more pronounced.

On a normal, engine-assisted approach, power is used to control the rate of descent and the flightpath to the aiming point on the runway. Without power, the descent rate is greater and the pitch attitude of the aeroplane must be lower to maintain the desired approach speed. The result is a steeper approach path to the runway on a glide approach and so the aeroplane must be positioned higher on final than normal. The lower nose position in the glide, especially with full flap, will mean that the change of pitch attitude required in the round-out will be greater.

Figure 13e-1 ***A glide approach is steep and the round-out more pronounced***

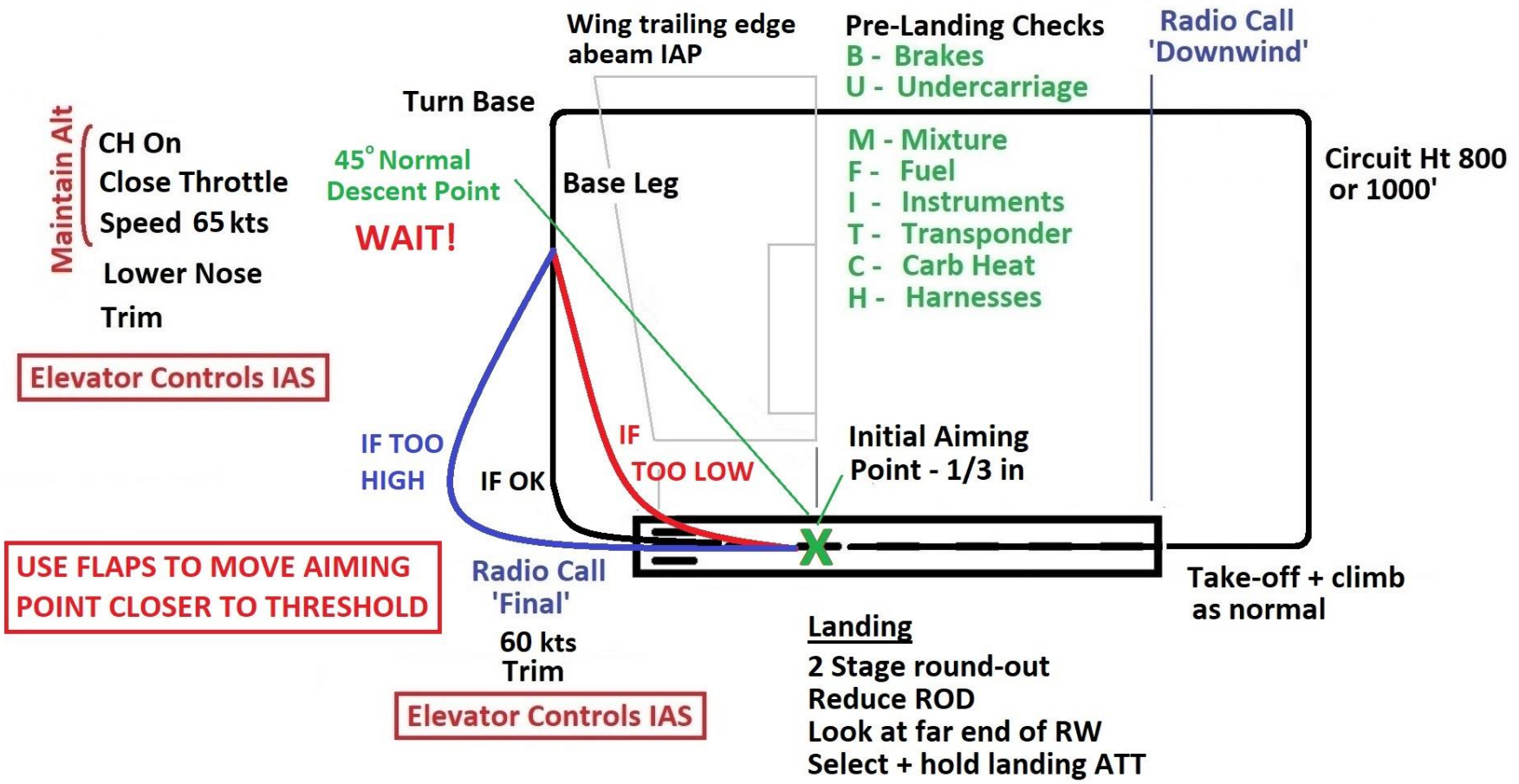
Board Briefing

Ex 13 c: Glide Approach + Landing

28Feb22

AIM: To learn to approach and land without the use of engine power.
T&E: Other a/c, Engine overheat, wake turbulence, Infringement, RW Excursion, Carb icing.
M: Lookout, Pre-Landing Cx, Carb Heat.

Airex: 1: Take-off + Climb to Downwind. 2: DEMO Glide Approach + Landing. 3: Practice Glide Approaches



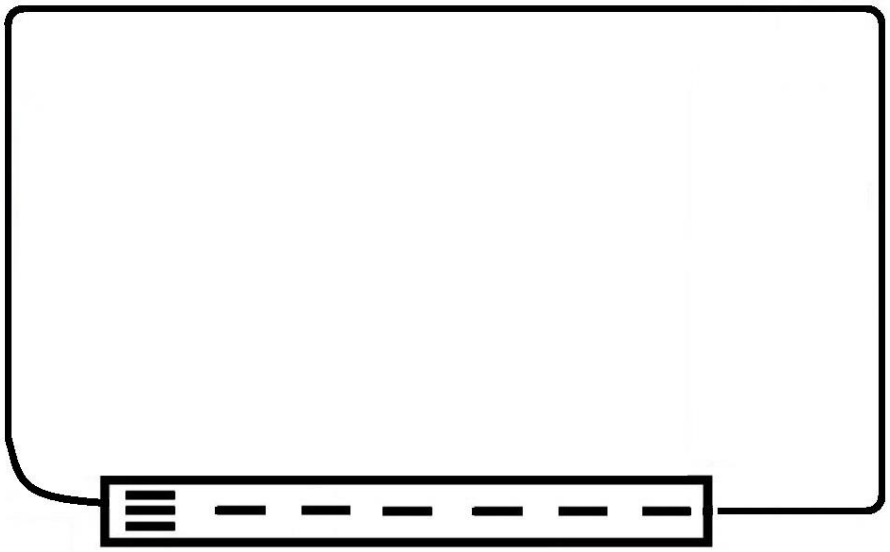
Skeleton Board Briefing

Ex 13 c: Glide Approach + Landing

28Feb22

AIM: To learn to approach and land without the use of engine power.
T&E:
M:

Airex: 1: **2:** **3:**



Air Exercise (Lesson Points correspond to the numbers in the Flight Prompt Cards)

Lesson Point 1:	**Revision:** The student will need no assistance or prompting to get the aircraft as far as lining up on the runway and taking off. Once on downwind leg:
Lesson Point 2:	'I have control. Follow me through as I demonstrate a glide approach and landing. Here we are on downwind leg. First I make my call, then carry put my pre-landing checks. As the runway gets to 45° over my shoulder I begin to turn onto base leg in the normal way. But I am not going to reduce power or select flap at this stage. I maintain the circuit height until I am sure I could get to the middle of the runway with idle power only. Do you think I could make it in from here? I think we should leave it a few seconds more with today's wind. Now, I am fairly sure I could make the runway – I turn on the carb heat, close the throttle and maintain circuit altitude as the speed reduces. As the speed reaches 65 kts, I lower the nose and trim. I now maintain 65 kts with elevator. Looking at the runway and judging my height. How does it look to you? Where do you think we will touchdown? I think we will land half way down the runway, so I use flaps to bring the aiming point closer to the start of the runway. I select a stage of flap and notice that the aiming point now seems to be about a third of the way in. I select a second stage. Now turning onto final. My aiming point still needs to be brought a little closer, so I select final flap and reduce to 60 kts. Then I continue the landing as before.'
Lesson Point 3:	'I want you to practice the circuit, followed by a glide approach and landing. You have control.' **STUDENT PRACTICE several glide approaches to landing or touch and go.**
Lesson Point 4:	If traffic and local rules permit, a glide approach from overhead can be a good exercise for the student. Place the aircraft over the middle of the runway at 2000' agl pointing towards the middle of the downwind leg. Make sure the circuit is clear and ATC are aware. 'I have control. Here we are 2000' above the runway and watch as I demonstrate a glide to landing from here. I put on the carb heat and close the throttle. I make sure I am always aware where the runway is. Currently it is just behind me. I am going to fly away for a short while, then turn into the circuit, all the time noting my altitude. Here we are roughly downwind at about 1500', which is a good height. I carry on along the downwind leg and do the before landing checks. I judge the turn on to base leg at about 1000'. I think I am going to touchdown close to the start of the runway, so I will delay flap. Now turning onto final. My aiming point is now about a quarter of the way in, so I start selecting flap to bring it closer. I select final flap and reduce to 60 kts. Then I continue the landing as before.'
Lesson Point 5:	If traffic and local rules permit, place the student in the same position as before. 'I want you to practice the glide approach and landing from here. You have control.' **STUDENT PRACTICE of a glide approach to landing.**
After Landing, Shutdown & Post-flight:	The student may vacate the runway and carry out all checks and radio calls. All taxy, shutdown and post-flight duties should now be second nature.

Flight Prompt Card

Ex 13c – Glide Approach & Landing

AIREX:
1: REVISION: Student take-off to downwind.
2: DEMO/FT/TEACH glide approach & landing.
3: STUDENT PRACTICE glide from normal circuit.
4: DEMO (if reqd) glide app from overhead (2000' aal).
5: STUDENT PRACTICE glide from overhead.

Debriefing

- There is a subtle difference in the way the flaps are used in a glide approach. In a normal approach, the flaps are selected on a schedule determined by the position in the circuit – 2 stages on base, 3rd stage on final. However in a glide approach it is quite different. The flaps are used to move the aiming point closer to the ideal point on the runway. If, in a clean configuration, the aiming point is already the start of the runway, then it is quite possible that no further flap will be used.
- You can further test the student's judgement of the glide by asking them to perform a glide approach without the use of flaps or side-slipping. This means that if they close the throttle too late, they cannot bring the aiming point closer other than by S turns.

Common Student Faults

- Students are often optimistic about the glide performance of their aircraft. They also fail to grasp that the performance will change with the weather, so what worked yesterday, may well not work today. Initially, involve them in deciding when to close the throttle and help them learn the decision making processes.

Common Instructor Faults

- Some instructors like to close the throttle on behalf of the student and then ask them to make a glide approach from here. This is not ideal since it removes the student from the decision making process.

Ex 13d – Bad-Weather Circuit & Landing

Practical Considerations

- Bad weather circuits are often called low-level circuits and are usually flown due to low cloud base and/or visibility.
- The student should be competent at normal circuits before moving onto this lesson.
- The take-off and climb out on bad weather circuits are different to a normal circuit, so the instructor should demonstrate an entire circuit first.

Long Briefing

A brief discussion of the reasons why a bad-weather circuit might be necessary is useful.

Board Briefing

Ex 13d: Bad-Weather Circuit

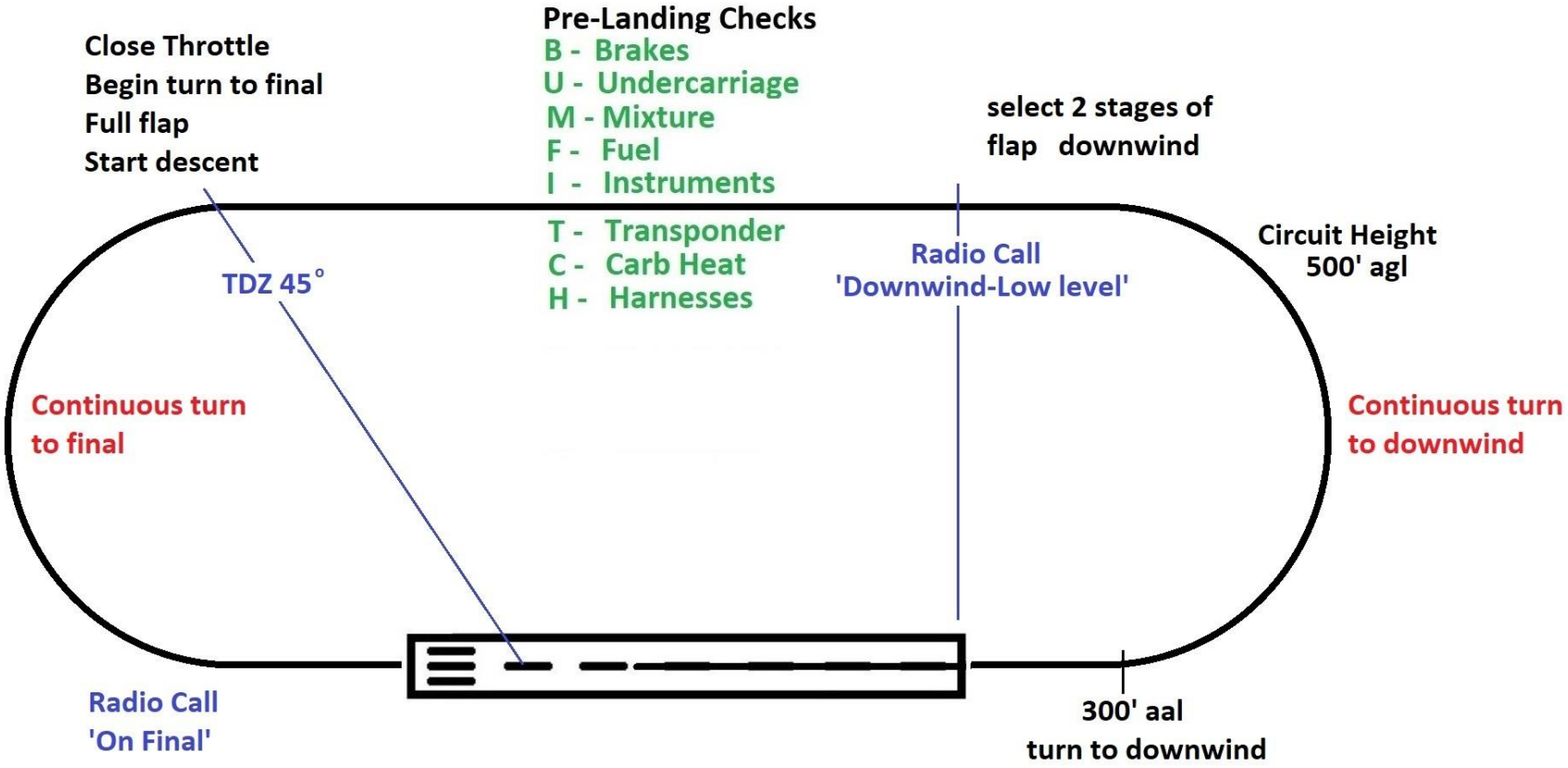
05 Mar 21

AIM: To learn to fly a bad weather circuit to land.

T&E: Circuit traffic, Terrain, Obstacles, Loss of control.

M: Lookout, MSA, Pre-flight study, Instruments, Bank angle.

Airex:



Skeleton Board Briefing

Ex 13d: Bad-Weather Circuit

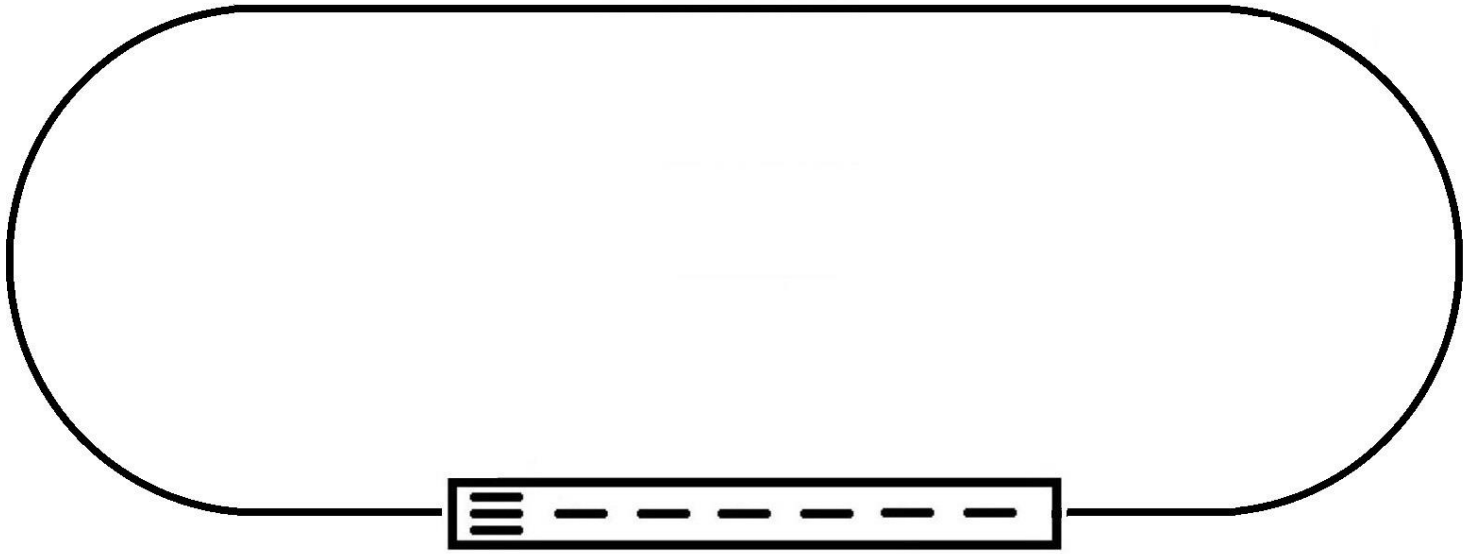
28Feb22

AIM: To learn to fly a bad weather circuit to land.

T&E:

M:

Airex:



Air Exercise (Lesson Points correspond to the numbers in the Flight Prompt Cards)

Lesson Point 1:	**Revision:** The student will prepare the aircraft and get it as far as the holding point for the instructor's take-off. Since the first turn is made at 300', it is best for the instructor to handle the take-off:
Lesson Point 2:	'I have control. Follow me through as I demonstrate a bad weather circuit, approach and landing. Here we are on the runway. We are going to assume the weather is poor with a cloud base of 600' agl and a visibility of only 1500m. I apply full power as normal and rotate at 55 kts. Once established in the climb at 65 kts, I turn onto downwind at 300. Note there is no crosswind leg, just a continuous 15 degree angle of bank climbing turn to 500' on the downwind leg. Once downwind, I select 2 stages of flap and make my call '*G-AB downwind low-level, touch and go*'. I now complete the checks. Notice how much closer we are to the runway, but given the poor visibility, that is what we need. As the runway threshold passes 45° over my shoulder, I put on the carb heat, close the throttle, select full flap and begin a continuous turn onto final. Note again, no base leg. Rolling out on final, I make my call and land in the normal way'
Lesson Point 3:	'I want you to practice the bad weather circuit, approach and landing. You have control.' **STUDENT PRACTICE several bad weather circuits to landing or touch and go.**
After Landing, Shutdown & Post-flight:	The student may vacate the runway and carry out all checks and radio calls. All taxy, shutdown and post-flight duties should now be second nature.

Flight Prompt Card

Ex 13d: Bad-Weather Circuit

AIREX:
1: REVISION: Student prepares a/c for take-off.
2: DEMO/FT/TEACH bad weather circuit, approach & landing to Touch & Go.
3: STUDENT PRACTICE bad wx circuits.

Debriefing

- Point out the usefulness of this technique when the weather is bad. Remind the student not to use it to cut in front of other aircraft in the circuit.

Common Student Faults

- The bad-weather circuit is flown closer to the runway than the student is used to. He may be tempted to move away to generate more room. This will result in him becoming low on base or final, and in real bad weather runs the risk of losing sight of the runway.
- A wind across the circuit can cause problems if not considered beforehand. Be ready to call for adjustment to the downwind heading to allow for such wind.

Common Instructor Faults

- Make sure the traffic situation in the circuit will permit you to carry out this kind of circuit. Aircraft on downwind may object to you cutting in front.

Ex 13e – Soft/Short Field Approach & Landing

Practical Considerations

- Ex 12 and 13 are usually combined and called ‘Circuits’.
- The student should be competent at normal circuits before moving onto this lesson.
- If available, take the student to a soft or short airfield.

Long Briefing

To be added.

Board Briefing

Air Exercise (Lesson Points correspond to the numbers in the Flight Prompt Cards)

Lesson Point 1:	**Revision:** The student will prepare the aircraft and get it as far as the holding point for the instructor's take-off. The student may have to be reminded to use the appropriate take-off flap setting depending on type.
Lesson Point 2:	Soft Field Take-Off: 'I have control. Follow me through as I demonstrate the soft field take-off technique. The idea is to get the nosewheel off the ground as soon as possible and then get airborne and stay in ground effect as the speed increases. We have one stage of flap selected which will help. I smoothly apply full power, holding the control column a little way back. Notice as the speed passes 50 kts, the nose starts to lift and the aircraft becomes airborne. It is too slow for safe flight, so I check forward to the straight and level attitude just a few feet above the runway. Notice the speed increasing. As it reaches 65 kts, I climb away as normal. Once I have positive rate of climb and the speed is 65 kts, I can retract the flap. You have control'
Lesson Point 3:	The student can be given the task of flying the circuit until on final. **STUDENT PRACTICE circuit to final.**
Lesson Point 4:	Once on final. Soft Field Landing: 'I have control. Follow me through as I demonstrate a soft field approach and landing. All is the same as a normal circuit until on final. I make sure I have full flap selected, and reduce to the recommended short field speed of 54 kts. Controlling my speed accurately with throttle. As I touch down, I hold the nosewheel off the ground as long as possible. Then gentle braking to bring the aircraft to a halt.'
Lesson Point 5:	Student taxy back to take off position: 'I now want you to practice a soft field take-off and landing. You have control.' **STUDENT PRACTICE of soft field take-off and landing.**
Lesson Point 6:	Short Field Take-Off: 'I have control. Follow me through as I demonstrate the short field take-off technique. The idea is to get the aircraft off the ground as soon as possible and stay in ground effect as the speed increases towards Vx. We have one stage of flap selected which will help. I smoothly apply full power, holding the control column a little way back. Notice as the speed passes 50 kts, the nose starts to lift and the aircraft becomes airborne. It is too slow for safe flight, so I check forward to the straight and level attitude just a few feet above the runway. Notice the speed increasing. As it reaches 55 kts, Vx, I climb away at that speed. Once clear of obstacles I can increase to 65 kts, Vy. Once I have positive rate of climb and speed is 65 kts, I can retract the flap. You have control'
Lesson Point 7:	The student can be given the task of flying the circuit until on final. **STUDENT PRACTICE circuit to final.**

Lesson Point 8:	Once on final. Short Field Landing: 'I have control. Follow me through as I demonstrate a short field approach and landing. All is the same as a normal circuit until on final. I make sure I have full flap selected, and reduce to the recommended short field speed of 54 kts. Controlling my speed accurately with throttle. It is important I touch down right at the start of the runway at the correct speed. I mustn't hold off to get a smoother landing. As I touch down, I would apply maximum braking, but for the purposes of this practice I will use normal braking to prevent damage.'
Lesson Point 9:	Student taxy back to take off position: 'I now want you to practice a short field take-off and landing. You have control.' **STUDENT PRACTICE of short field take-off and landing.**
After Landing, Shutdown & Post-flight:	The student may vacate the runway and carry out all checks and radio calls. All taxy, shutdown and post-flight duties should now be second nature.

Flight Prompt Card

Ex 13e – Soft/Short Field Approach & Landing

AIREX:
1: REVISION: STUDENT PRACTICE start, taxy, checks.
2: DEMO/FT/TEACH Soft-field take-off with flap.
3: STUDENT PRACTICE circuit to final.
4: DEMO/FT/TEACH Soft field ldg to fullstop. Taxi back.
5: STUDENT PRACTICE soft field T/O & Landing.
6: DEMO/FT/TEACH Short Field t/o w flap & Vx climb.
7: STUDENT PRACTICE circuit to final.
8: DEMO/FT/TEACH Short Field appr & ldg to full stop. Taxi back.
9: STUDENT PRACTICE short field t/o & ldg.

Debriefing

To be added

Common Student Faults

As an examiner, when I ask an applicant to carry out a short field landing, I am often asked what flap setting I would like. This clearly shows a lack of understanding of the technique!

Common Instructor Faults

To be added

Ex 15 - Advanced Turns

Practical Considerations

- For the pre-flight briefing, make sure you have an aircraft model available and that you use it in the correct orientation relative to the student.
- Do not forget to teach steep descending turns and recovery from spiral descent in this lesson.

Long Briefing

From EASA Part-FCL:

Long briefing objectives:

(1) the forces;
(2) use of power;
(3) effect of load factor: (i) structural considerations (ii) increased stalling speed.
(4) physiological effects;
(5) rate and radius of turn;
(6) steep, level, descending and climbing turns;
(7) stalling in the turn and how to avoid it;
(8) spinning from the turn: recovery at the incipient stage;
(9) spiral dive;
(10) unusual attitudes and recoveries.

Board Briefing

EX 15: Advanced Turning

07 Aug 21

AIM: To learn to fly level and descending steep turns at 45°AoB.
T&E: Other a/c, Disorientation, Terrain, Overbanking, Spiral descent, Loss of Control.
M: Lookout, Anchor point, Map study, Learn unusual attitude recovery technique (TRP).

Airex: **1: Revision:** Medium Turns. **2:** Demonstration of Steep Turn at 45° AoB.
3: Steep Level Turn at 45° AoB

Entry

Lookout 
Select Att
Aileron - 45° AoB
Rudder to balance 
Elevator - add back pressure
Power - +200 rpm

Maintain

LOOKOUT - ATTITUDE - INSTRUMENTS
Altimeter - ASI - DI - Ball - AI

Exit

Anticipate - 1/3 AoB
Select S & L Attitude
Ailerons - Wings Level
Rudder to balance
Elevator - Relax back pressure
Power - -200 rpm
Lookout 

4: Overbanking

60°AoB Steep Turns

Repeat exercise at 60 AoB
Full Power Needed!

5: Steep Descending Turns

Enter Glide Descent
Increase AoB as required
No power needed
Maintain AoB accurately

IAS +5 kts for each 10° over 30°AoB

6: Unusual Attitudes

TRP: THROTTLE - ROLL - PITCH

Spiral Descent
Recovery - Reduce Power
Reduce AoB
Then adjust pitch

Skeleton Board Briefing

EX 15: Advanced Turning

07 Aug 21

AIM: To learn to fly level and descending steep turns at 45°AoB.
T&E:
M:

Airex: **1: Revision:** **2:**

3: Steep Level Turn at 45° AoB

Entry	Maintain	Exit
		
4: Overbanking	**5:** Steep Descending Turns	**6:** Unusual Attitudes

Air Exercise (Lesson Points correspond to the numbers in the Flight Prompt Cards)

Lesson Point 1:	**Revision:** The student has now gone solo. The start-up, taxy, power checks, before take-off checks and the take-off and climb should all now occur without prompting.
Lesson Point 2:	**Revision:** Ask the student to carry out a medium bank turn to both the left and right to ensure the correct technique. **STUDENT PRACTICE.**
Lesson Point 3:	**Steep Turn to Left:** 'I have control. Watch as I demonstrate the attitude for a steep turn to the left at 45 degrees angle of bank. Note where the horizon cuts the coaming. Note the 45 degree angle of bank shown on the attitude indicator. I want you to remember this attitude.'
Lesson Point 4:	'Now, I want you to take control and maintain this steep turn to the left.' **STUDENT PRACTICE.**
Lesson Point 5:	Once satisfactory for at least 360 degrees, the student is asked to roll out. He hasn't been taught to do this, all he has to do is reset the straight and level attitude. He will need to be told to reset the power. 'Now, I want you to return to normal straight and level flight. The power will also need to be reset to the cruise setting.' **STUDENT PRACTICE.**
Lesson Point 6:	'Now, I want you to follow me through as I demonstrate how to roll into a steep turn to the left. First a good lookout, especially to the left, then I look to the front and roll the aircraft about the spinner, balancing with rudder. As I pass 30 degrees, I add a little power and continue to 45 degrees. I now maintain the attitude we saw before. All the time keeping a good lookout and checking the instruments. Now I want you to maintain the steep turn. You have control.' **STUDENT PRACTICE.** 'Now, I want you to roll out of the turn, back to normal straight and level flight. Remember to reset the cruise power.' **STUDENT PRACTICE.**
Lesson Point 7:	'Now, I want you to practice the whole thing: roll into a steep turn to the left, maintain it, and roll out of the turn on my command back to normal straight and level flight. After rolling out, have another lookout for traffic. You have control' **STUDENT PRACTICE.**
Lesson Point 8:	'Now, I want you to practice a steep turn to the left rolling out on north. You are going to have to anticipate by 20-30 degrees. You have control.' **STUDENT PRACTICE.**
Lesson Point 9:	**Steep Turn to Right:** 'I have control. Watch as I demonstrate the attitude for a steep turn to the right at 45 degrees angle of bank. Note where the horizon cuts the coaming. Note how the picture is different from a steep turn to the left. I want you to remember this attitude.'
Lesson Point 10:	'Now, I want you to take control and maintain this steep turn to the right.' **STUDENT PRACTICE.**

Lesson Point 11:	Once satisfactory for at least 360 degrees: 'Now, I want you to return to normal straight and level flight.' **STUDENT PRACTICE.**
Lesson Point 12:	'Now, I want you to follow me through as I demonstrate how to roll into a steep turn to the right. First a good lookout, especially to the right, then I look to the front and roll the aircraft about the spinner, balancing with rudder. As I pass 30 degrees, I add a little power and continue to 45 degrees. I now maintain the attitude we saw before. All the time keeping a good lookout and checking the instruments. Now I want you to maintain the steep turn. You have control.' **STUDENT PRACTICE.** 'Now, I want you to roll out of the turn, back to normal straight and level flight.' **STUDENT PRACTICE.**
Lesson Point 13:	'Now, I want you to practice the whole thing: roll into a steep turn to the right, maintain it, and roll out of the turn on my command. You have control' **STUDENT PRACTICE.**
Lesson Point 14:	'Now, I want you to practice a steep turn to the left rolling out on west. You have control.' **STUDENT PRACTICE.**
Lesson Point 15:	**60° Steep Turns:** Once 45° turns are satisfactory: 'Now, I want you to follow me through as I demonstrate how to roll into a 60° steep turn to the left. First a good lookout, especially to the left, then I look to the front and roll the aircraft about the spinner, balancing with rudder. As I pass 30 degrees, I add full power and continue to 60 degrees. Note this new attitude and the high g force. All the time I am keeping a good lookout and checking the instruments. Now I want you to maintain the steep turn at 60°. You have control.' **STUDENT PRACTICE.** 'Now, I want you to roll out of the turn, back to normal straight and level flight. Remember to reset the cruise power and lookout.' **STUDENT PRACTICE.** 'Now, I want you to practice the steep turn to the left at 60° and roll out on my command. You have control.' **STUDENT PRACTICE.** 'Now, I want you to try a steep turn to the right at 60° and roll out on east. You have control.' **STUDENT PRACTICE.**
Lesson Point 16:	**Steep Gliding Turns at 40°:** Once 45 & 60° turns are satisfactory: 'Now, I want you to set the aircraft up in a glide descent. You have control.' **STUDENT PRACTICE.** 'Now, I want you to follow me through as I set the aircraft up in a steep gliding turn. I lookout to the left and roll into a 40° turn to the left. Because of the angle of bank, I increase the speed to 70kts with elevator. Notice our hight rate of descent. This is very useful when descending through a gap in the clouds, for example. When I am exit, I roll back to wings level and return to 65 kts.'

Lesson Point 17:	'Now, I want you to practice a steep gliding turn to the right. You have control.' **STUDENT PRACTICE.**
Lesson Point 18:	**Unusual Attitude (UA) Recoveries:** Once steep gliding turns are satisfactory: 'Now, we are going to look at the recovery from unusual attitudes. If the aircraft gets itself into such an attitude, we need to know the best way to recover. The first thing we do is look at the speed. If the speed is high and/or increasing I close the throttle. If the speed is low and/or reducing I add full power. Then I roll to wings level. Then I set the correct pitch attitude for straight and level flight. So the sequence is: THROTTLE-ROLL-PITCH: T-R-P. Watch as I demonstrate. • Here, the speed is high and increasing, so I close the throttle, then roll wings level, then raise the nose. • Here, the speed is low and reducing, so I add full power, then roll wings level, then lower the nose. • Here, the speed is normal and not changing, so I leave the throttle alone, then roll wings level. The nose is already in the correct attitude.
Lesson Point 19:	'Now, I am going to put the aircraft into an unusual attitude. When I give you control, I want you to return to straight and level at no particular heading or altitude. You have control.' **STUDENT PRACTICE.**
Landing & Post-flight:	The student has now gone solo. The circuit, approach, landing, after landing and shutdown should all now occur without prompting.

Flight Prompt Card

Ex 15: Steep/Advanced Turns

AIREX:
1: REVISION STUDENT PRACTICE Start-up thru to clb.
2: REVISION Revise medium level turns L & R.
3: STEEP LEFT TURN: DEMO 45º turn to left. Student watches only. Note nose/horizon att.
4: STUDENT takes control and maintains steep turn.
5: Student rolls out to S&L att on command. (Power)
6: DEMO/FT entry to 45º turn to left, STUDENT takes control to maintain & roll out on command. (Power)
7: STUDENT PRACTICE whole thing.
8: Repeat rolling out on headings (anticipation!).
9: STEEP RIGHT TURN: DEMO 45º turn to right. Student watches only. Note nose/horizon att.
10: STUDENT takes control and maintains steep turn.
11: STUDENT rolls out to S&L att on command.
12: DEMO/FT entry to 45º turn to right, STUDENT takes control to maintain & roll out on command.
13: STUDENT PRACTICE whole thing.
14: Repeat rolling out on headings (anticipation!).
15: Repeat at 60º AoB.
16: STUDENT takes control and sets up glide descent. FT as instructor rolls into steep gliding turn (40° AoB & 70 kts) and rolls out. 17: STUDENT PRACTICE
18: DEMO recovery from Unusual Attitudes (UAs).
A: nose low with bank, B: nose high with bank,
C: Level steep turn. TRP (Throttle-Roll-Pitch).
19: STUDENT PRACTICE of the 3 scenarios.

Debriefing

Make sure the student remembers the order of actions for recovers from unusual attitudes.

Common Student Faults

- Student does not look out over the spinner during entry, and so ends up nose low.
- Student does not add power and the speed reduces.
- Student does not apply back pressure and enters a spiral dive.
- Student performs a perfect steep turn but is doing so on instruments with no lookout.
- Student does not understand the AI fitted to the aircraft and cannot gauge 45° AoB.

Common Instructor Faults

- Remember, the mechanics of a steep turn are similar to those of a medium level turn, so not too much instruction should be required. The main differences is the picture outside the window, and this should be emphasised.
- When setting up the aircraft into the unusual attitudes, it is easy to leave the aircraft either too fast in the descending turn, or at the point of stall in the climbing turn. A good way of setting this up is as follows:
    - **Steep Descending Turn:** First raise the nose to reduce speed then bank left or right and lower the nose below the horizon. This gives a steep descending turn with the airspeed still well below Vne.
    - **Climbing Turn:** First lower the nose to increase speed then bank left or right and raiser the nose well above the horizon. This gives a climbing turn with the airspeed still well above the stall.

Ex 16 - Forced Landing without Power

Practical Considerations

- For the pre-flight briefing, make sure you have an aircraft model available and that you use it in the correct orientation relative to the student.
- Make sure you know an area where there are plenty of good fields.
- Run through the engine failure checks in the classroom first so the student doesn't have to learn this in the air.
- Rather than going straight into engine failures, a good way to introduce this is to fly around looking for fields and assessing them as suitable landing sites. Then build up to picking out 1500' and 1000' points. Only then should you proceed to the simulated failure.
- During the course of practice engine failures in single-engined aircraft, the instructor is effectively also acting as a safety pilot. In a real engine failure, the student would not be expected to 'warm the engine' periodically. If they choose to do so then that is ok, otherwise the instructor must do so since he has a 'duty of care' to the aeroplane. This is no negative reflection on the student. In a similar manner, the instructor is responsible for making sure the carb heat is on, low flying rule adherence and calling the go-around.

Long Briefing

From EASA Part-FCL:

Long briefing objectives:

(1) selection of forced landing areas;
(2) provision for change of plan;
(3) gliding distance: consideration;
(4) planning the descent;
(5) key positions;
(6) engine failure checks;
(7) use of radio: R/T 'distress' procedure;
(8) base leg;
(9) final approach;
(10) go-around;
(11) landing considerations;
(12) actions after landing: aeroplane security;
(13) causes of engine failure.

Board Briefing

Ex 16: FORCED LANDING WITHOUT POWER

28Feb22

AIM: To fly a forced landing pattern from Cruising Altitude.

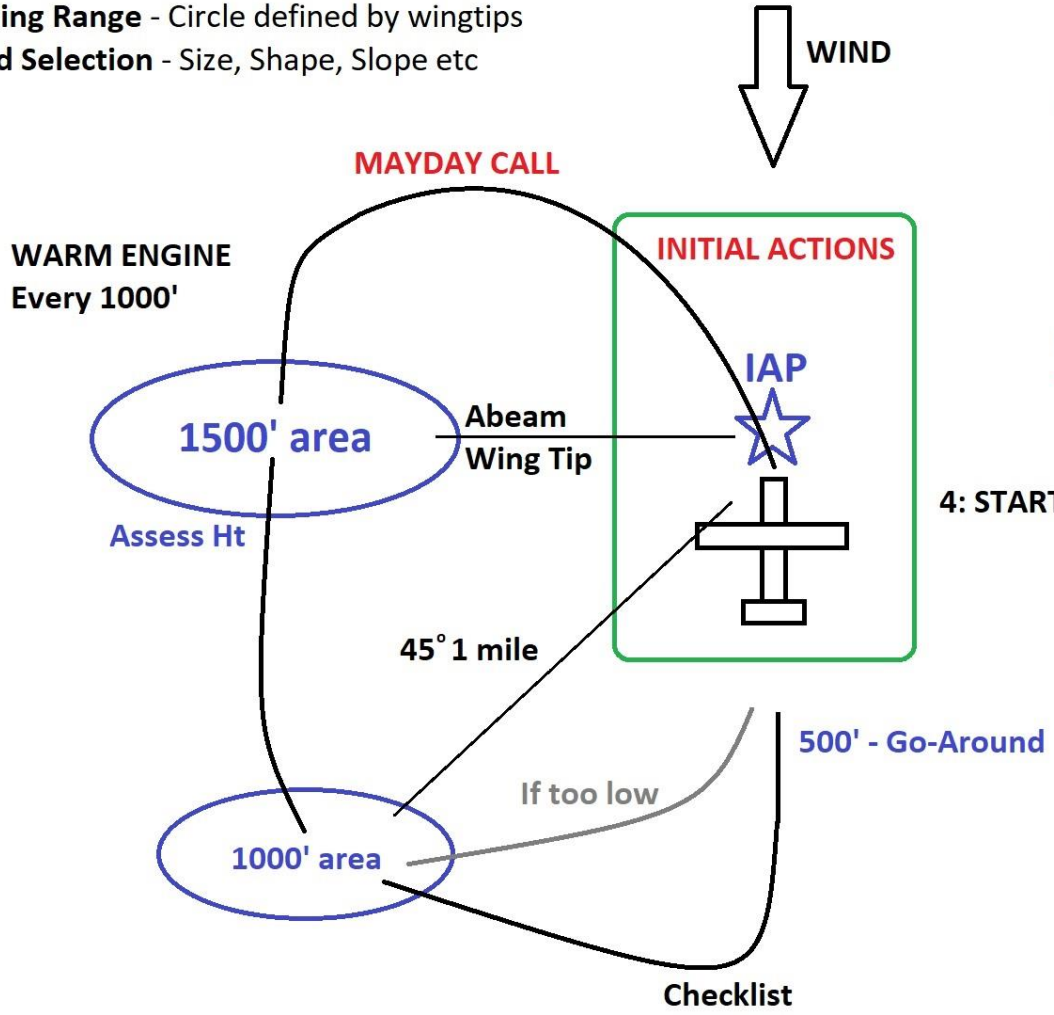
T&E: Other a/c, Terrain, Obstacles, Engine Overheat, Real Engine Failure, Rule Breaking.

M: Lookout, Ts & Ps, Carb Heat, 500'.

AIREX: 1: REVISION: Glide Approach

2: Gliding Range - Circle defined by wingtips

3: Field Selection - Size, Shape, Slope etc



INITIAL ACTIONS

FLy the a/c - 65 kts Glide Speed
Locate Field
Fly to Overhead
IAP 1/3 way in
Select 1000' area
Select 1500' area
Turn towards 1500' area

4: START OVER FIELD 2500 agl

Skeleton Board Briefing

Ex 16: FORCED LANDING WITHOUT POWER

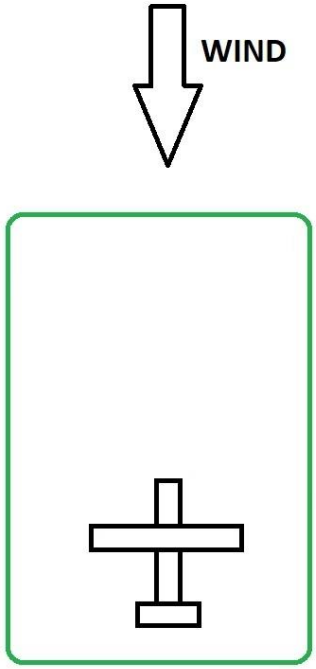
28Feb22

AIM: To fly a forced landing pattern from Cruising Altitude.

T&E:

M:

AIREX:



Air Exercise (Lesson Points correspond to the numbers in the Flight Prompt Cards)

Revision:	The student has now gone solo. The start-up, taxy, power checks, before take-off checks and the take-off and climb should all now occur without prompting.
Lesson Point 1:	**Field Selection** On the way to the local area start involving the student in selection and assessment of suitable fields. Ask the student what the surface wind is likely to be in this area and which way they would approach the field.
Lesson Point 2:	Position the aircraft directly above a large field. 'I have control. Watch as I demonstrate the procedure for a practice forced landing without power. Engine Failure! First, I fly the aeroplane. I trim for 65 kts best glide. I'm looking around, there are plenty of fields around. I'll come back to that later. How's my descent going? Still maintaining 65 kts. Why has the engine stopped? Could it be carburettor heat? Carb heat to ON (Leave on for exercise) Could it be Fuel? Fuel quantity checked. Fuel cock ON. Doesn't seem to be a fuel problem. Could it be electrical? Battery Master/Alternator ON, ammeter checked. Doesn't seem to be an electrical problem. Could it be ignition? Magnetos on BOTH. Try L then R. Then BOTH again. Doesn't seem to be an ignition problem. I will try a restart. (Simulate for exercise). OK, no restart. For the purposes of the exercise, I will warm the engine. How's my descent going? Still maintaining 65 kts. OK, it looks like I will have to make a forced landing. I will have another look for a field. I see one down there on the left. I will assess the field using the S system. It is a good Size, has the right Shape, no adverse Slope, the Surface is suitable for landing, no Stock in it, the Surroundings are clear of any obStructions, there is Sivilisation nearby, there is a good underShoot and overShoot field if needed. How's my descent going? Still maintaining 65 kts OK, so I am going to have to land in that field. I will make a MAYDAY call. '*MAYDAY MAYDAY MAYDAY G-ABCD engine failure, making forced landing in field 2 miles south of Newbury. 2 on board. Student pilot*'. How's my descent going? Still maintaining 65 kts. I will plan the descent to the field. The wind is from the north so I will land towards the north. I plan to be over that lake on the downwind leg at 1500' and over that village at the end of downwind leg at 1000'. I'm going to brief you, my passenger on the brace position, seat belts, and how to leave the aircraft after landing. How's my descent going? Still maintaining 65 kts. I am now over the lake at 1600' so all is good. Carrying along towards the village. Over the village at 1000', so turning left onto base leg. Am I high or low? I feel OK. Turning final. I think I will land halfway into the field, so I will select 2 stages of flap. Still a little high, so last stage of flap. For the purposes of the exercise, I will warm the engine again. OK, I am committed to landing. One last radio call, then shutdown drills: Throttle IDLE, Mixture IDLE CUT-OFF, Ignition/Magnetos OFF, Batter Master/ALT Switch OFF. Seat Belts SECURE. Final assessment of height. All looking good. I am happy I would make that field. I will now go around.'

Lesson Point 3:	Get the student to climb you to 1500’ agl and start looking for a different field. Arrange the student to be 1500’ agl on a downwind leg for the field. Make sure the wind direction is considered. ‘I have control. Now here we are downwind at 1500’ for that nice big green field on the left. I want you to fly the circuit to short final and go-around on my call. I don’t want you to worry about any of the checks or calls, just fly the circuit. You have control.’ **STUDENT PRACTICE.**
Lesson Point 4:	Get the student to climb you to 2000-2500’ agl and start looking for a different field. Arrange the student to be at the beginning of a downwind leg for the field. Again, make sure the wind direction is appropriate. ‘I have control. Now here we are at the beginning of the downwind leg at 2200’ for that green field on the left. I want you to fly the circuit to short final and go-around on my call, just like before. I don’t want you to worry about any of the checks or calls, just fly the circuit. You have control.’ **STUDENT PRACTICE.**
Lesson Point 5:	Get the student to climb you to 2500’ agl and look for a different field. Arrange the student to be overhead the field or slightly to the right of it, so he can see it down on his left. Again, make sure the wind direction is appropriate. ‘I have control. Now here we are at 2800’ just over that big field you can just see out on your side. I want you to fly the circuit from here to short final and go-around on my call, just like before. I don’t want you to worry about any of the checks or calls, just fly the circuit. You have control.’ **STUDENT PRACTICE.**
Lesson Point 6:	If satisfactory, get the student to climb you back to 2500’ agl to the same position. It may be necessary to reteach the checks and calls. ‘I have control. Now here we are again at 2800’ in the same position as before. I want you to fly the circuit again, this time I want you to carry out the checks and practice MAYDAY calls. You have control.’ **STUDENT PRACTICE.**
Lesson Point 7:	If satisfactory, get the student to climb you to 3000’ agl, without positioning the aircraft close to a chosen field. ‘I have control. Now here we are at 3200’. Soon, I am going to close the throttle and simulate an engine failure. I want you to fly the whole procedure including the field selection, checks and practice MAYDAY calls. You have control.’ **STUDENT PRACTICE.**
Lesson Point 8:	On climbout from successful PFL with the flaps now retracted and at least 800’ agl: ‘I want you to imagine we have just taken off from our home airfield.’ Turn on the carb heat and close the throttle. ‘Engine failure!’
Lesson Point 9:	Repeat Lesson Point 7 and possibly 8 until satisfactory.
Revision:	The circuit, approach, landing, after landing and shutdown should all now occur without prompting.

Flight Prompt Card

Ex 16: Forced Landings without Power

AIREX:
1:Start looking for fields and assess. Wind direction?
2: DEMO Only FULL PFL. Pick field on left into wind.
3: Put student at 1500' L downwind for a different field. Allow to descend and go-around at 500'. No checks.
4: Put student further back downwind at 2- 2500'. Repeat with no checks.
5: Repeat without checks overhead new field at 2500'.
6: Repeat with checks overhead same field at 2500'.
7: Repeat with checks away from field at 3000'.
8: EFATO on climb away if appropriate.
9: More practice.

Debriefing

- The take home message here is to fly the best glide speed and not try to stretch the glide. This will probably seem counter-intuitive to the student. If a student persists in stretching the glide, a quick demonstration can show them the futility.
- The crux of this exercise is not the low approach/landing (that has already been covered in Ex13 Glide Approaches), but getting to the 1000' point at the correct height with all the checks done. If that happens, then the landing should be straightforward.

Common Student Faults

1. Once a field has been picked, a student can often be reluctant to change it, even when it is clear that the approach is not going to work. For the purposes of the skill test, the student may change the field only once. Other students may dither and keep changing field, never settling on one until all other options have been removed.
2. The student may be concerned about warming the engine, and some may over-use it in order to gain height. In the skill test, it is made clear that warming the engine is not necessarily the student's responsibility. The examiner will warm the engine if the student fails to do so, and no negative marking will occur.

3. The student may carry out all the drills required for the exercise in silence, and the examiner has no idea what is going on in their head, or if they have a plan. If that student makes it to a suitable field for a forced landing, the examiner will not know if it was due to good planning, or sheer luck! A better way is for the student to verbalise everything, leaving the examiner in no doubt as to his thinking processes. A suggested patter follows (actual checks and speeds may differ slightly depending on aircraft type):

- Engine Failure! First, fly the aeroplane. Trim for 65 (75 or as appropriate) kts best glide
- Find a field. Look around, there are plenty of fields around, I'll come back to it later.
- How's my descent going? Still maintaining 65 kts
- Why has the engine stopped?
- Could it be carburettor heat? Carb heat to ON (Leave on for exercise)
- How's my descent going? Still maintaining 65 kts
- Could it be Fuel? Quantity checked. Selector on correct tank. Change tank if an option. Fuel pressure ok. Doesn't seem to be a fuel problem.
- How's my descent going? Still maintaining 65 kts
- Could it be electrical? Battery Master/Alternator ON, ammeter checked. Doesn't seem to be an electrical problem.
- How's my descent going? Still maintaining 65 kts
- Could it be ignition? Magnetos on BOTH. Try L then R. Then BOTH again. Doesn't seem to be an ignition problem.
- How's my descent going? Still maintaining 65 kts
- Let's try a restart (Simulate for exercise). OK, no restart.
- For the purposes of the exercise, let's warm the engine.
- How's my descent going? Still maintaining 65 kts
- OK Let's have another look at that field. Am I happy with it, or can I find a better one?
- Let's assess the field using the S system. It is a good Size, has the right Shape, no adverse Slope, the Surface is suitable for landing, no Stock in it, the Surroundings are clear of any obStructions, there is Sivilisation nearby, there is a good underShoot and overShoot field if needed.
- How's my descent going? Still maintaining 65 kts
- OK, so we are going to have to land in that field. Let's make a MAYDAY call. 'MAYDAY MAYDAY MAYDAY G-ABCD engine failure, making forced landing in field 2 miles south of Newbury. 2 on board. Student pilot'.
- How's my descent going? Still maintaining 65 kts
- Let's plan the descent. The wind is from the north. Choose a method and any specific points around the circuit and corresponding altitudes.
- I'm going to brief my passenger(s) on the brace position, seat belts, and how to leave the aircraft after landing. Consider unlatching a door.
- How's my descent going? Still at 65 kts. Descending towards the field at a suitable height. Do I need gear and/or flaps yet? Am I high or low?
- For the purposes of the exercise, let's warm the engine again.
- OK, we are committed to landing. One last radio call, then crash drills: Throttle IDLE, Mixture IDLE CUT-OFF, Fuel Selector OFF, Ignition/Magnetos OFF, Batter Master/ALT Switch OFF. Seat Belts SECURE
- Final assessment of height. Consider use of flap, gear, sideslipping, S turns as needed to make field.

Common Instructor Faults

- Many instructors teach this lesson using the **TLAR** method. That is – That Looks About Right. The instructor has the benefit of many hours of flight time and a lot of practice at PFLs. The student is not so lucky. Therefore trying to teach the student to plan a descent and approach to a field using this method is doomed to failure. Hence the method suggested above – the student is starting from a known position (directly over the field) and has a defined path to take to reach final approach. It is a **repeatable** method. Height checks are provided along the way to modify if needed.
- It can be tricky arranging placement of the aircraft for the student before failing the engine. Make sure you know where the wind is coming from, and which way you want the student to land. Try to keep the field on the student's side, especially for the first few PFLs.

Ex 17 - Precautionary Landings with Power

Practical Considerations

- For the pre-flight briefing, make sure you have an aircraft model available and that you use it in the correct orientation relative to the student.
- Make sure you know an area where there are plenty of good fields.
- Make sure you will not cause nuisance to people living near your chosen field.
- This is not a very satisfactory lesson to teach, since due to the constraints of low flying rules, the student doesn't get to see the field from a very low level circuit. The only way round this is to go to an uncontrolled grass strip (with the necessary permissions from the owner)

Long Briefing

From EASA Part-FCL:

Long briefing objectives:

(1) occasions when necessary (in-flight conditions);
(2) landing area selection and communication (R/T procedure);
(3) overhead inspection;
(4) simulated approach;
(5) climb away;
(6) landing area selection:
    (i) normal aerodrome;
    (ii) disused aerodrome;
    (iii) ordinary field;
(7) circuit and approach;
(8) actions after landing; aeroplane security.

Board Briefing

24Feb22

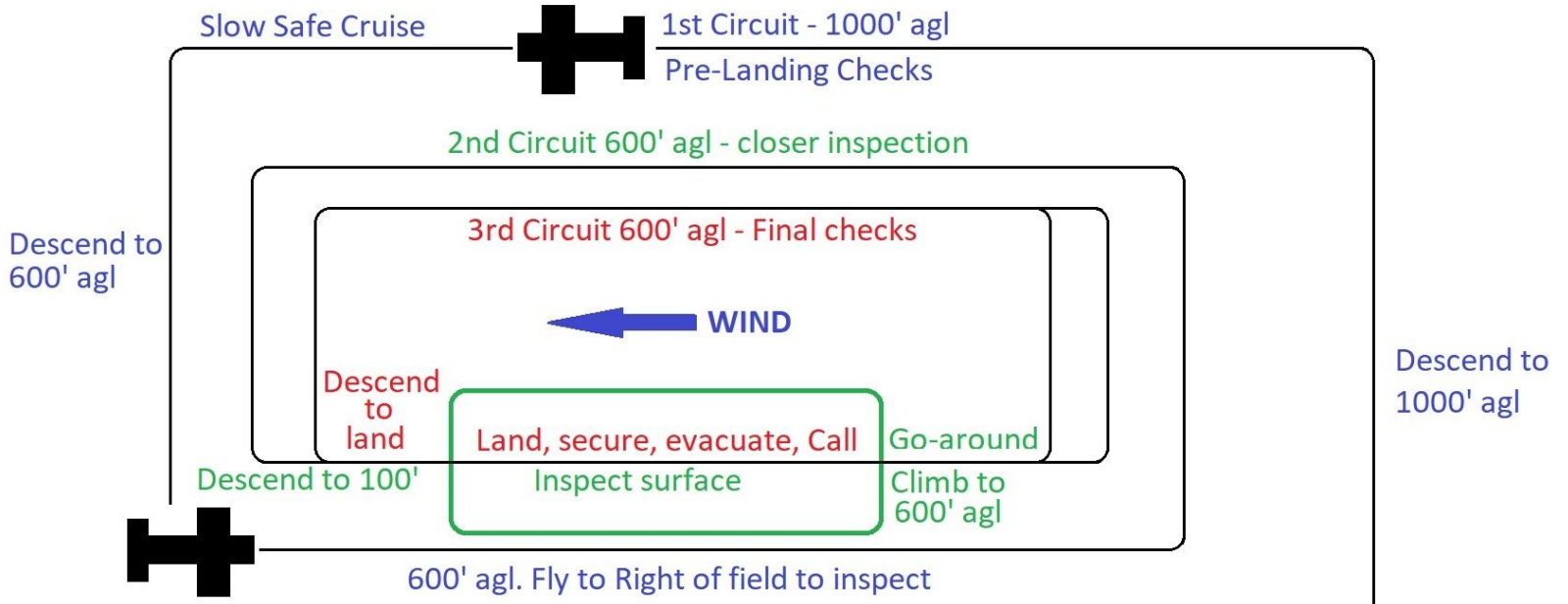
Ex 17: Precautionary Landing with Power

AIM: To learn to identify a suitable off-airport landing site and land with power.

T&E: Other a/c, Low flying rules, Terrain & Obstacles, Engine Overheat, Carb Icing.

M: Lookout, Go-around, Pre-Flight Planning, Ts & Ps, Carb Heat.

AIREX **1: Why?:** Lost, Getting dark, Fuel, Illness, Engine problems.
2: Where?: Farm strip, Active airfield, Disused airfield, field.
3: Plan: Make a Positive decision, Radio Call, Assess 5 S's, Inspection circuits.



4: After Landing
Secure a/c (checklist)
Evacuate to safe place
Call Police, Instructor
Contact Landowner
Care for passengers
DO NOT TAKE-OFF

Start Here

1000' agl or higher
Pick a Field
PAN or MAYDAY

Skeleton Board Briefing

24Feb22

Ex 17: Precautionary Landing with Power

AIM: To learn to identify a suitable off-airport landing site and land with power.

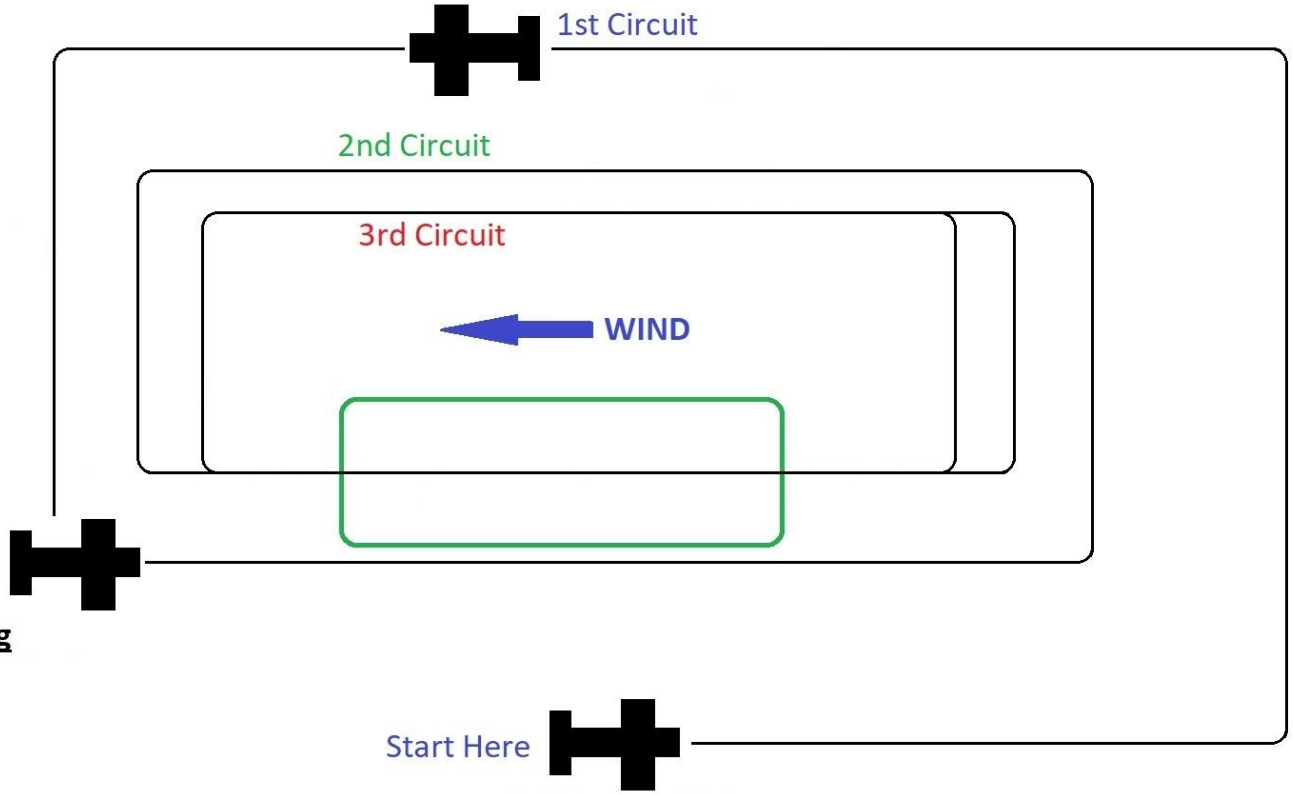
T&E:

M:

AIREX **1: Why?:**

2: Where?:

3: Plan:



4: After Landing

Air Exercise (Lesson Points correspond to the numbers in the Flight Prompt Cards)

Revision:	The start-up, taxy, power checks, before take-off checks and the take-off and climb should all now occur without prompting. Be increasingly critical of any errors as the student is approaching skill test.
Lesson Point 1:	Position the aircraft at 1500' agl with a suitable field out to the left somewhere. 'I have control. Watch as I demonstrate the procedure for a precautionary landing with power. Let's imagine that our engine is running very roughly, and we are worried it may soon fail. Lets start by looking for a suitable field. Can you see any your side? Yes that one looks good.'
Lesson Point 2:	'I will start by flying an inspection circuit around it at 1000' agl. For the purposes of the exercise, I will add 500' so that we don't break any rules. As I fly around it I am assessing its size, shape and slope. I am checking for any animals or power lines in the field. I am looking for any obstacles such as high trees or masts nearby. Thinking of the wind, I am planning to make my approach this way. That puts my downwind leg over there. That church would be a good place to turn onto base leg, and that lake is on final. Having flown all the way round the field, I am happy with it so far. I will make a radio call to let the authorities know.'
Lesson Point 3:	'This time, I will descend to 500', or 1000' in our case, to have a closer look. I descend on base leg down to 1000'. I am looking for obstacles on the approach, and I want to have a closer look at the surface of the field. Still looking good. There is also a farmhouse nearby to raise the alarm.
Lesson Point 4:	'This time, I will descend to 100', or 600' in our case, to have a very close look. I descend on base leg down to 1000', and once on final I continue down to 600'. I fly level over the field looking for any ruts or potholes in the surface.
Lesson Point 5:	'This time, I would land, or carry out a touch and go if I was unsure of the surface. I am using the short and soft field techniques, so full flap and 55 kts on final. For the purposes of the lesson, I go-around at 600' agl.'
Lesson Point 6:	Climb back to 2000' agl with no field planned. 'OK, now it's your turn. Due to the fact that we are simulating rapidly running out of fuel, I happen to know that in 15 minutes, the engine will stop. I'd like you to find and assess a suitable landing site please. You have control.' **STUDENT PRACTICE as required.**
Revision:	The circuit, approach, landing, after landing and shutdown should all now occur without prompting. Be increasingly critical of any errors as the student is approaching skill test.

Flight Prompt Card

Ex 17: Precautionary Landings

AIREX:
1: Choose a field on the left. For the purposes of the exercise, 500' is added to all altitudes. Ex altitudes in brackets.
2: DEMO: Inspect the field from 1000' (1500') carry out full circuit to left. Note landmarks for turning X-wind, base and final. Radio Call.
3: DEMO: Descend to 500' (1000') for closer inspection. Carry out another circuit.
4: DEMO: Third time round, descend on final to 100' (600') for close examination. Fly level & Go-Around.
5: DEMO: Next time would land or T&G. Short field landing technique. 6: STUDENT PRACTICE

Debriefing

To be added

Common Student Faults

- Students often struggle with this exercise. They have just managed to do PFLs without power in a limited time. Now you are giving them much more time. Many students spend too long looking for a field, and then changing their minds. It is important they make a positive decision to land. I often say to them that 'I happen to know that in 20 mins, the engine will stop'. I then start the stopwatch. Many are still making inspection runs 20 mins later.

Common Instructor Faults

- Many instructors choose not to teach this lesson, and just mention it in passing. It is worth practicing this lesson, even if only tagged onto the end of Ex16 as it highlights different priorities.

The SEP (land) Rating & Course

Pre-Entry Requirements

There are no pre-entry requirements.

Course Details

Flight Training: The SEP(land) course consists of sufficient dual flight training as required to pass the skill test. Instruction may be conducted by an FI(A) or CRI(A) and must be conducted at an ATO or DTO.

Ground Training: There is no specific requirement for ground tuition.

Assessment: There will be a skill test/proficiency check with an examiner at the end, which is similar in content to the PPL initial skill test, but with a reduced navigation section.

Validity

The rating is valid for 24 months plus the remainder of the month of test.

Revalidation

FCL.740.A Revalidation of class and type ratings - aeroplanes.

(b) Revalidation of single-pilot single-engine class ratings:

(1) Single-engine piston aeroplane class ratings and TMG ratings. For revalidation of single-pilot single-engine piston aeroplane class ratings or TMG class ratings the applicant shall:

- (i) within the 3 months preceding the expiry date of the rating, pass a proficiency check with an examiner;
  OR
- (ii) within the 12 months preceding the expiry date of the rating complete 12 hours of flight time in the relevant class, including:
  - 6 hours as PIC,
  - 12 take-offs & 12 landings, **and**
  - Refresher Training of at least 1 hour of total flight time with a flight instructor (FI) or a class rating instructor (CRI). Applicants shall be exempted from this refresher training if they have passed a class or type rating proficiency check, skill test or assessment of competence in any other class or type of aeroplane.

Renewal

To renew an expired rating, refresher training at an ATO or DTO is required to the necessary standard, followed by a proficiency check with an examiner.

Recency

FCL.060 Recent experience:

(b) Aeroplanes, helicopters, powered-lift, airships and sailplanes.

A pilot shall not operate an aircraft in commercial air transport or carrying passengers:
as PIC or co-pilot unless he/she has carried out, in the preceding 90 days, at least 3 take-offs, approaches and landings in an aircraft of the same type or class or an FFS representing that type or class.

Additionally, to carry passengers at night, the PIC must, in the preceding 90 days, have completed at least 1 take-off, approach and landing at night as a pilot flying in an aircraft of the same type or class or an FFS representing that type or class, or hold an instrument rating.

Differences Training

In order to be able to fly aircraft with the following characteristics:

- Variable Pitch Propeller
- Retractable Undercarriage
- Turbo or Supercharged Engine
- Electronic Flight Instrument System (EFIS)
- Single Lever Power Control (SPLC)
- Tail Wheel

Differences training with an instructor (FI or CRI) must be carried out and signed in the student's logbook.
For single-engined aircraft this is a one-time sign-off and is valid for life.
The differences training shall be conducted at any of the following:

- an ATO;
- a DTO in the case of aircraft referred to in points (a)(1)(c) and (a)(2)(c) of point DTO.GEN.110 of Annex VIII;
- an AOC holder having an approved differences training programme for the relevant class or type.

Notwithstanding the requirement in point (b), differences training for TMG, single-engine piston (SEP), single- engine turbine (SET) and multi-engine piston (MEP) aeroplanes may be conducted by an appropriately qualified instructor unless otherwise provided in the OSD.

Future chapters cover this training.

Typical SEP (land) ST/PC Flight Test Format

It is important that an instructor is familiar with the content of each test and typical test profiles to be flow during test in order to better prepare the student.

Navigation:

- Blackbushe to Newbury, Thame, or Whitchurch.

Airwork:

- Steep turns L & R.
- Slow flight: turns, climbs descent.
- 2 of the 3 stalls.

Practice Forced Landing:

- Set scenario of rough running engine before closing throttle.
- Glide approach assessed during the PFL.
- Go-around assessed during PFL
- EFATO assessed after go-around from PFL.

Installed Systems:

- Use of GPS and autopilot to return to Blackbushe

Fire: Drill & System Failure

- Smoke emanating from instrument panel. Solved by turning off Master Battery switch.
- Discuss loss of radio, transponder and possibly flaps.

Rejoin, Circuits & RTO:

- Rejoin of circuit.
- Normal landing to touch & go.
- Flapless landing to touch & go.
- Short field landing to full stop.
- RTO from stopped position or taxy back.

Differences Training

FCL.710 addresses class and type ratings concerning variants.
In order to extend privileges to another variant of aircraft within one class or type rating, the pilot shall undertake differences or familiarisation training as appropriate.
Differences training requires the **acquisition of additional knowledge and training on an appropriate training device or the aircraft**.

Familiarisation training requires the **acquisition of additional knowledge** (GM1 FCL.710). This could be self study of the PoH.

2.1 Class ratings (aeroplane): SP and SEP or MEP aeroplane (land or sea):

Manufacturer	Aeroplanes		Licence Endorsement
All manufacturers	SEP (land)	(D)	SEP (land)
	SEP (land) with variable pitch propellers		
	SEP (land) with retractable undercarriage		
	SEP (land) with turbo or super charged engines		
	SEP (land) with cabin pressurisation		
	SEP (land) with tail wheels		
	SEP (land) with EFIS		
	SEP (land) with SLPC		
	SEP (sea)	(D)	SEP (sea)
	SEP (sea) with variable pitch propellers		
	SEP (sea) with turbo or super charged engines		
	SEP (sea) with cabin pressurisation		
	SEP (sea) with EFIS		
	SEP (sea) with SLPC		
All manufacturers	MEP (land)	(D)	MEP (land)
	MEP (sea)	(D)	MEP (sea)

2.2 Class ratings (aeroplane): SP and SEP TMG (land):

Manufacturer	Aeroplanes		Licence Endorsement
All manufacturers	All TMGs having an integrally mounted, non-retractable engine and a non-retractable propeller		TMG

Whenever "(D)" is indicated in column 3 in one of the lists mentioned in paragraphs 2.1 to 2.3 above, it indicates that differences training in accordance with FCL.710 is required when moving between variants or other types of aircraft which are separated by the use of a line, in column 2.

Although the licence endorsement (in column 4) contains all aircraft listed in column 2, the required familiarization or differences training must be completed before operating the respective variants

For SEP class ratings, differences training is a one-time sign off and never needs to be renewed.

For MEP class ratings, each different MEP aircraft is considered as a difference. The differences last for 2 years and must then be renewed.

Other than VP prop, differences are transfereable between SEP and MEP class ratings. VP prop needs a separate sign-off for SEP and MEP due to the differences in design of the system.

DIFFERENCES TRAINING:

RETRACTABLE UNDERCARRIAGE (LANDING GEAR)

A study Guide by Steve Pells Issue 06 19 Jun 21

The purpose of this document is to provide guidance and backround information for pilots who already hold as SEP (Land) rating, and wish to undertake differences training to allow them to fly aircraft with the following characteristics:

- Variable Pitch Propeller
- Retractable Undercarriage
- Turbo or Supercharged Engine
- Electronic Flight Instrument System (EFIS)
- Single Lever Power Control (SPLC)
- Tail Wheel
- Oxygen & Pressurisation

1: Rules & Regulations:

Differences Training should be conducted by the holder of an appropriate instructor rating who meets the following requirements:

(a) Hold a valid Flight Instructor or Class Rating Instructor qualification (SPA) for the aircraft on which the training is to be carried out.
(b) Hold a valid Type/Class Rating applicable to the particular aircraft to be flown.
(c) Have completed their own Differences Training to fly the particular aircraft on their own licence.

Upon completion of Differences Training, and when the instructor is satisfied that an acceptable level of competency has been achieved, the pilot's logbook or equivalent document should be annotated to show successful completion and be signed by the instructor who conducted the training.

The Differences Training certification is recommended to take the following format and should include the Type or Class Rating designation of the Aeroplane;

Date	Certified Differences Training In:	Signed	CAA Reference Number
	Example:- **Single Power Lever Controls** **SE Piston (Land)**	..... Name	

Date	Certified Differences Training In:	Signed	CAA Reference Number
	Example:- **Manual Engine Controls** **Turbocharged Engines** **ME Piston (Land)**	..... Name	

There is no test, as such, and for single-engine aeroplanes, this is a one-time sign-off that never expires. It is valid for 2 years on multi-engined aeroplanes.

If it has been a while since your last flight in such an aircraft, a review of procedures, or a flight with an instructor is recommended.

PART-FCL: EASA Differences Notes & Syllabus for Retractable Undercarriage:

NOTE: *Differences Training completed, for this section (retractable undercarriage), on an SEP aeroplane, does provide equivalent qualification on MEP aeroplanes and vice versa.*

Theoretical Knowledge Topics:

All Aeroplanes:

Principles and effect on performance;
System construction and function;
Limitations – raising, lowering and extended.
Operation including pre-flight checks and normal handling:
After take-off & On approach/go-around and landing.
In-flight system failures and emergency lowering.
Operation of undercarriage during: Engine failure after take-off/go-around (Emergency raising – as applicable to type) & Engine failure during other phases of flight, including approach and landing.
Effect on glide performance.

Considerations for MEP Aeroplanes:

Effect on performance – one or more engines inoperative.
Handling during approach and landing/go-around with one or more engines inoperative.
Effect on engine out allowance and landing committal height.

2: Introduction:

Throughout this section, reference will be made to the undercarriage system and speed limits that apply to Piper PA28R-201 Arrow III, such as G-CBZR and G-OARU, but the principles for other aircraft are similar.

In order to reduce drag and allow the aircraft to cruise faster and burn less fuel, some aircraft are equipped with retractable landing gear. The operation of the undercarriage system is rarely complicated, but the consequences of getting it wrong cannot be overstated.

Although gear-up landings are rarely fatal in light aircraft, they are always expensive and highly embarrassing for the pilot.

To be honest, there is really only one rule when it comes to flying aircraft with retractable landing gear:

Make Sure the Gear is DOWN for Landing!!!

It sounds obvious, but it continues to happen on a regular basis worldwide.

Not only this, but sometimes the gear is retracted on the ground by accident. Usually, there is some kind of a guard on the switch to prevent inadvertent retraction, and usually a 'weight on wheels' sensor prevents operation of the gear on the ground. But these systems do fail. The best practice is to be very careful when getting in and out of the aircraft, so that you do not accidentally knock the gear lever. Also, never touch it on the ground. Some people check the gear lever is down, and then touch the lever to verify its position. Best practice suggests just looking at it and only touching it in the air when the time comes to retract it.

3. Landing Gear Retraction:

Placard speeds for an Arrow III

Usually there are airspeed limits for the retraction and lowering of the gear, and these 2 limits are often different. Sometimes there is a third limit, a maximum airspeed with the gear lowered. These limits are often placarded next to the gear lever.
Usually the gear retraction limit is the lowest, for example in the PA28R-201 Arrow III the maximum gear retraction speed is 107 KIAS. Above this speed the gear must not be retracted. Should this situation occur, simply raise the nose to reduce airspeed below the limit and then retract.

The maximum speed for gear lowering in this aircraft is 129 KIAS.
The maximum speed with the gear down is also 129 KIAS.

The next question is when do we retract the gear? The best answer is 'when we no longer require it'. Do not be in a hurry to retract the gear after take-off. Should sink be encountered, or an engine failure occur immediately after rotation, you will be glad to have the gear down. Once there is no longer sufficient runway remaining to land back on in case of need, then we can retract the gear.

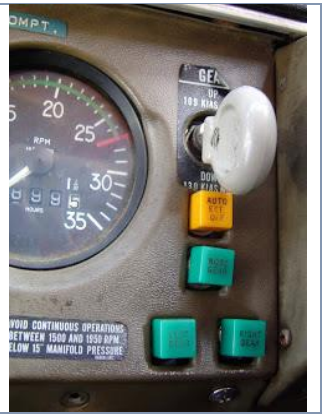
Usually, before retracting the gear, it is good practice to apply the brakes first, to stop the main wheels from spinning.

To retract the gear, there is usually some kind of latch to be moved to allow the lever to move. On the Arrow, you pull the lever towards you and then move it to UP. On aircraft such as the Bonanza, there is a sliding latch under the switch that need to be moved.

On the Arrow, there is a red gear unsafe light above the AI/Horizon, and a loud horn that operate together while the gear is retracting. Once retraction is complete, the light goes out and the horn silences. The 3 green lights go out.

On the Mooney, there is only one light for gear down, and another for gear up. These is also a floor mounted sight window which displays the word UP or DN.

A special note about the Arrow:
The design of the aircraft includes an automatic dimming of the 3 green gear position lights. Whenever the NAV lights are turned on, the 3 green lights dim. This makes them perfectly visible at night, but during the day, you would swear that they are not illuminated. This has caused numerous Arrow pilots to declare emergencies, thinking that the gear has failed to extend. If you ever find a situation in such an aircraft when all 3 green lights appear to be out, check the NAV light switch first!
Also, in the Arrow, and some other Piper aircraft too, the 3 square green gear position lights can be swapped over. This is to allow you to check that the gear is down when a bulb has failed. Let's say that when you lower the gear you only get 2 out of the 3 lights. Simply pull out the unilluminated green square and one of the others that was working. Then put them back in the other way round. If the same light fails to illuminate, then you may have a problem.



4: Landing Gear Warnings:

Most aircraft are equipped with a system to warn the pilot in case (s)he forgets to lower the gear. These are not failsafe and should never be relied upon. As well as providing useful warnings, they frequently occur as nuisance warnings as well. For example, in the Arrow:

a: Low power: If the power is reduced to idle, with the gear up, regardless of flap position, the gear unsafe light and horn will sound continuously. This means that in a descent, in order to get rid of the noise, you will have to add a little power (or lower the gear)
b: Landing Flaps: If more than Flap 10 is selected (i.e. 2 or 3 notches of flap) with the gear up, the warnings occur again. This can be a nuisance when taking off from a grass field with flap 25. Once airborne, you retract the gear. The warning will then sound continuously until the flap is retracted to 10 or less.
c: Gear Selector UP on the ground with the throttle at idle.

NOTE: These warnings usually require the Battery Master Switch to be in the **ON** position.

Auto Extension Feature:
As a result of several gear-up landings in the early days, some aircraft manufacturers, in an attempt to reduce mishaps, added a Gear Auto Extension Feature.
This was common on many Arrow aircraft. Basically, once the aircraft reduced speed below a set limit, the gear would automatically extend, thus eliminating accidents. However, this made life very difficult for training. Every time you practiced slow flight, or stalling, the gear would fall out. So, many operators have inhibited this feature.
No aircraft in the Blackbushe Flying Group currently has this feature enabled.

After landing, never be in a hurry to retract flaps, or switch off other items such as pitot heat. You could inadvertently retract the gear by mistake. Never do any of these actions while still on the runway. Vacate the runway and stop before moving any critical switches.

6: Normal Gear Extension:

When it's time to land, obviously we need to lower the landing gear. But when is the best time to do this?
If the circuit is busy with slower aircraft, it can sometimes be useful to lower the gear early. The gear produces quite a bit of drag, and can be useful in slowing you down, or getting you down if you are a little high.
However, the most usual place to take the gear is downwind. I suggest starting your pre-landing checks by lowering the gear. Always remember the gear lowering speed limit! I always wait until I have the correct gear down indication before moving on to other checklist items, because the check that it's down and locked can be missed otherwise.
A real danger occurs when you don't have a downwind position to trigger the lowering of the gear, for example if you join on base or on a long final. That is why, once established on short finals, we should always do our **Red, Blue, Green Checks**:

- REDS Mixture(s) Fully Rich
- BLUES Propeller(s) Max RPM
- GREENS Gear Down, 3 Greens

The landing gear switch and landing gear indication system in a Beechcraft Duchess Be-76 aircraft. Note the 'Gear in Transit' light.

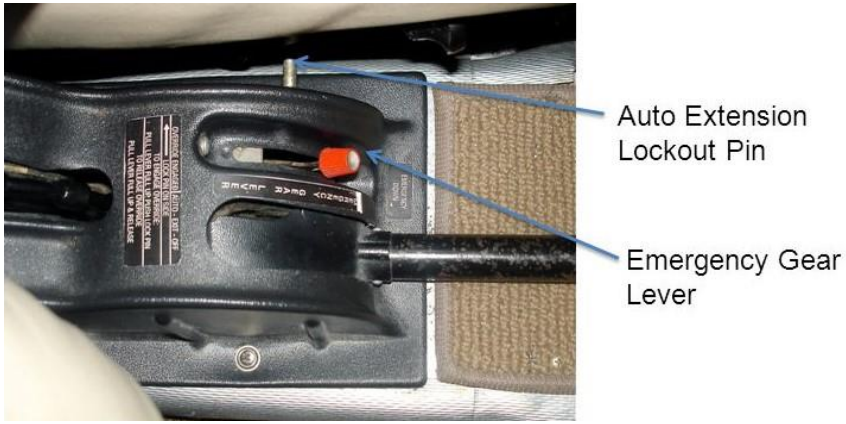
5: Emergency Landing Gear Extension:

Most light aircraft have gear that is controlled by a system of electrical signalling and hydraulic actuation. Should any of these systems fail, there is usually an emergency gear extension system which allows the gear to drop by gravity. Usually once lowered by such a system, the gear cannot be retracted again.

In the Arrow, there is a small lever below and at the front of the flap lever quadrant.

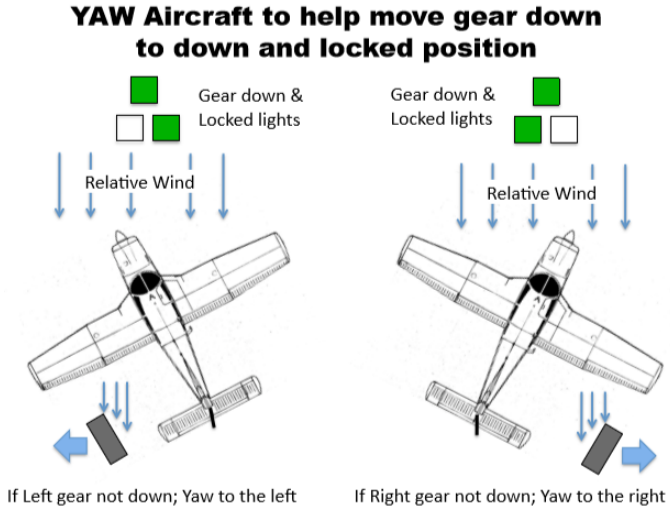
Emergency Landing Gear Extension

- Auto extension lockout pin must be pulled out to allow automatic or manual emergency gear extension to work
- Gear will automatic extend when speed is 87 KIAS or below
- To manual lower gear if normal system is not working, push and hold the emergency gear lever switch down towards the floor
- Extension is accomplished by manually releasing hydraulic pressure; gear free-falls; nose gear is assisted in free-fall/lock by a spring
- If gear does not indicate down and locked, yaw the airplane side to side



If the emergency lowering is required, don't try to remember the checklist. Get the checklist out and go through it carefully. It's not a time critical situation.

Part of the Emergency checklist suggests yawing the aircraft with rudder if necessary, to help lower the gear.



In the Mooney, a safety latch at floor level at the front of the passenger cabin has to be moved, to allow a handle to be pulled up to 20 times to allow the gear to fall.

On the Beechcraft Duchess Be-76 aircraft, a special tool is used to operate the emergency landing gear extension system, which is located under a flap between the pilot's feet. Obviously, following the pre-flight check should make sure the tool is on board!

Be-76 Gear Tool and its stowage in the cockpit. Access to the operation mechanism is under a flap at floor level. Operating instructions are also provided.

Typical emergency checklist shown below:

PA28R-201 ARROW III: EMERGENCY LANDING GEAR EXTENSION

Prior to emergency Extension Procedure:

1. BATT MASTER/ALT Switch **CHECK ON**
2. Circuit Breakers **MONITOR**
3. NAV Light Switch **OFF (In daytime)**
4. Gear Indication Bulbs **CHECK**

- If landing gear does not check down and locked:

1. Airspeed **REDUCE BELOW 87 KIAS**
2. Landing Gear Selector Switch **GEAR DOWN POSITION**

- If gear has still failed to lock down, move and hold the emergency lever down to the Emergency Down Position.
- If gear has still failed to lock down, yaw the airplane abruptly from side to side with the rudder.

6: Engine Failure & Forced Landings:

If an engine fails, pilots who already have an SEP (land) class rating, will be familiar with PFLs (Practice Forced Landing). With a retractable geared aircraft, there are a couple of new considerations. First, if the engine fails with the landing gear in the UP position, the Gear Unsafe warning is likely to sound continuously until the ger is lowered. This can be highly distracting, but lowering the gear too early, greatly reduces your gliding range. A decision needs to be made as to when to lower the landing gear (if at all).

The following is from the PoH for the Arrow:

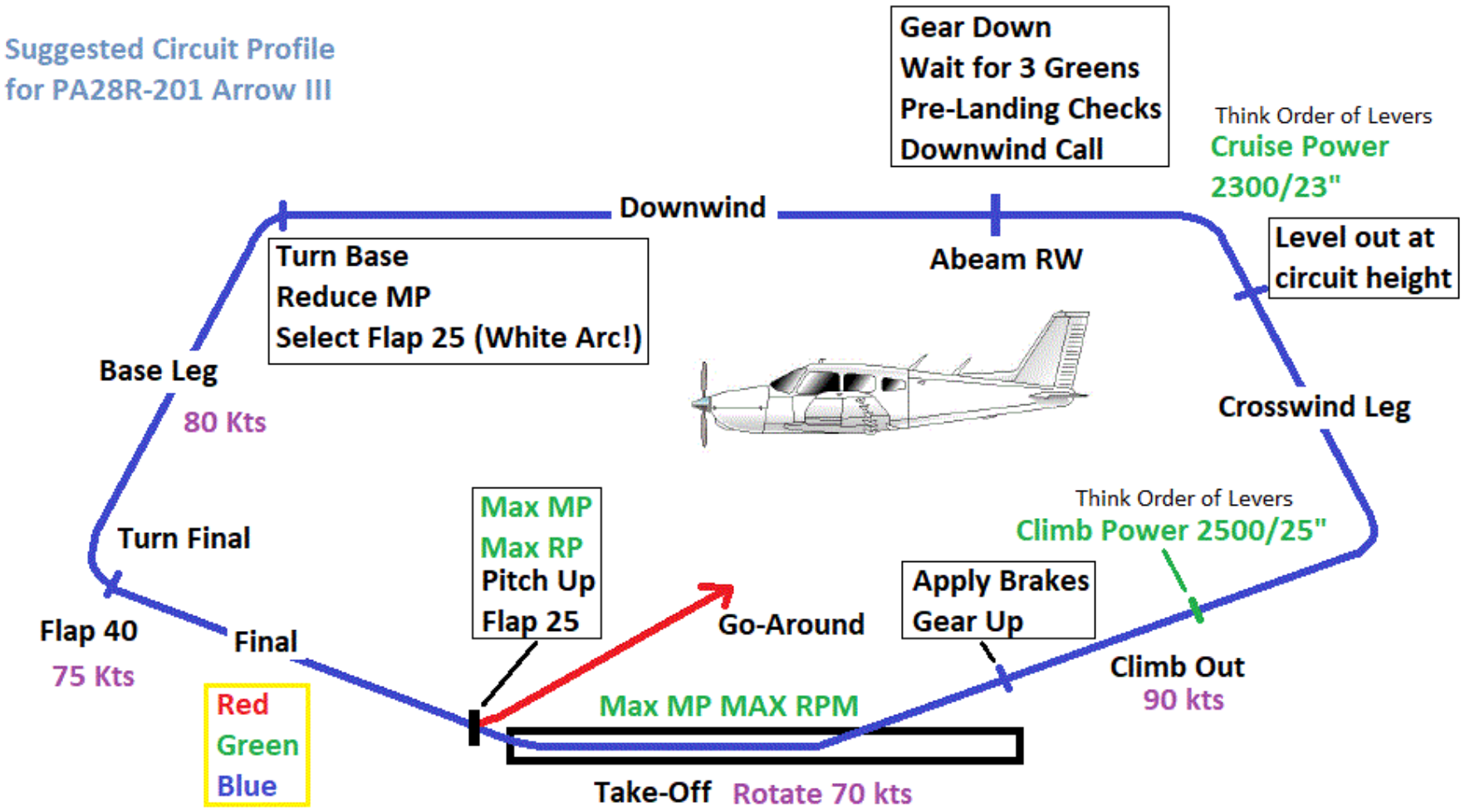
> Whether to attempt a landing with gear up or down depends on many factors. If the field chosen is obviously smooth and firm, and long enough to bring the plane to a stop, the gear should be down. If there are stumps or rocks or other large obstacles in the field, the gear in the down position will better protect the occupants of the aircraft. If, however, the field is suspected to be excessively soft or short, or when landing in water of any depth, a wheels-up landing will normally be safer and do less damage to the airplane.
>
> Touchdown should normally be made at the lowest possible airspeed.

7: Suggested Flight Profile for Training

A typical training flight will involve:

- External Checks to include undercarriage bays and services
- Familiarisation of the cockpit controls and indicators.
- Airspeed Limitations for operation
- Take off and gear retraction
- A look at the Gear warnings
- Practice using the Emergency Gear Lowering Procedure alongside the aircraft checklist.
- Practice Forced Landing (PFL) to highlight differences and show glide range
- Return to the airfield for touch and go training.

8: Suggested Circuit Profile for PA28R-201 Arrow 3



DIFFERENCES TRAINING:

Variable Pitch/Constant Speed Propellers

A study Guide by Steve Pells Issue 05 19Jun21

The purpose of this document is to provide guidance and backround information for pilots who already hold as SEP (Land) rating, and wish to undertake differences training to allow them to fly aircraft with the following characteristics:

- Variable Pitch Propeller
- Retractable Undercarriage
- Turbo or Supercharged Engine
- Electronic Flight Instrument System (EFIS)
- Single Lever Power Control (SPLC)
- Tail Wheel
- Oxygen & Pressurisation

1: Rules & Regulations:

Differences Training should be conducted by the holder of an appropriate instructor rating who meets the following requirements:

(a) Hold a valid Flight Instructor or Class Rating Instructor qualification (SPA) for the aircraft on which the training is to be carried out.

(b) Hold a valid Type/Class Rating applicable to the particular aircraft to be flown.

(c) Have completed their own Differences Training to fly the particular aircraft on their own licence.

Upon completion of Differences Training, and when the instructor is satisfied that an acceptable level of competency has been achieved, the pilot's logbook or equivalent document should be annotated to show successful completion and be signed by the instructor who conducted the training.

The Differences Training certification is recommended to take the following format and should include the Type or Class Rating designation of the Aeroplane;

Date	Certified Differences Training In:	Signed	CAA Reference Number
	Example:- **Single Power Lever Controls** **SE Piston (Land)**	..... Name	

Date	Certified Differences Training In:	Signed	CAA Reference Number
	Example:- **Manual Engine Controls** **Turbocharged Engines** **ME Piston (Land)**	..... Name	

There is no test, as such, and, for single-engined aeroplanes, this is a one-time sign-off that never expires. For multi-engined aeroplanes it is valid for 2 years. If it has been a while since your last flight in such an aircraft, a review of procedures, or a flight with an instructor is recommended.

Variable Pitch (VP) Propellers (all propeller aeroplanes) EASA PART FCL

These systems make a significant difference to performance in all phases of flight. Mostly, the instruction in this section will be given to pilots converting from SEP aeroplanes with fixed pitch propellers to SEP or MEP aeroplanes with VP propellers and constant speed units (CSU). The system on some older types may not include a CSU and instructors must ensure that all of the system differences and handling techniques, introduced by the new type, are properly covered in the training given.

NOTE: Differences Training completed, for this section (VP Props), on an SEP aeroplane, does **NOT** provide equivalent qualification on MEP aeroplanes (due to the system differences) nor vice versa.

Theoretical Knowledge Topics: All Aeroplanes

Principle of operation and effect on performance;
System construction and function;
Propeller system limitations;
Engine limitations and instrumentation.
Operation of throttle, mixture and propeller controls, including pre-flight checks &normal handling during:

- *Start up and taxying;*
- *Take-off and climb;*
- *Cruise at various power settings and speeds;*
- *Low speed handling and stall/spin recovery;*
- *Approach and go-around;*
- *Landing and shut down.*

In-flight failures, within the propeller system, including:

- *Loss of oil pressure;*
- *Loss of governor control;*
- *Overspeed;*
- *Underspeed.*

Emergency handling, during:

- *Engine failure after take-off/go-around;*
- *Engine failure during other phases of flight, including approach and landing;*
- *Effect of engine failure on glide performance.*

Emergency Handling Considerations for Multi-Engine Aeroplanes
Engine failures after take-off including propeller feathering and effect of wind-mill drag;
Circuit and approach with one or more engines inoperative;
Go-around with one or more engines inoperative; Landing with one or more engines inoperative.

2: Introduction:

Up until now, all the single-engined piston (SEP) aircraft you have flown are likely to have had a fixed pitch propeller. That is, the blade angle of the propeller is fixed, and cannot be adjusted by the pilot. This is a compromise, because propeller efficiency varies with aircraft speed, and so the propeller cannot be operating at maximum efficiency for both take-off and cruise. Some propellers have the blade angle set to make them most efficient for take-off, but this makes them less efficient in cruise, reducing their range and increasing fuel burn. Other propellers are set to be at maximum efficiency in the cruise, but this leads to poorer take-off performance.

An early solution to this problem was to have a 2-position lever in the cockpit which manually changed the blade angle of the propeller between take-off and cruise settings. As propeller and engine design improved, this has changed to a continuously variable propeller angle, controlled by a new lever in the cockpit.

Here, on the left, is the throttle quadrant for a Piper Arrow, showing the new Propeller Control Lever or RPM lever.

On most aircraft it is the middle of the 3 levers, and usually coloured blue.

In a twin enginned aircraft, this leads to a lot of levers to be managed!

The similar arrangement of levers in Cessna aircraft

The operation of the Mixture control is unchanged.

3: Constant Speed Unit (CSU) or Propeller Governor:

Rather than changing the blade angle of the propeller directly, the Propeller Control Lever (RPM lever) is used to select a desired RPM within the operating range (usually around 1500-2600 rpm). The blade angle then changes automatically to keep the RPM constant as speed changes. This is done by setting the desired RPM on the RPM gauge using the RPM lever to make changes. The propeller governor then uses a combination of springs and engine oil pressure to alter the blade angle to keep the RPM at the desired value.

When in the typical operation range for in-flight use (typically 2000-2600 RPM), the RPM lever is used to set a desired RPM value. This lever is quite sensitive, and so only small movements are needed. Once set, the RPM value should not change with speed or altitude (hence constant speed). The throttle (which used to be used to set engine RPM in fixed pitch aircraft), in now used to set a new parameter – Manifold Pressure (MP). Generally, this lever is much less sensitive and much larger movements are needed to produce the desired changes.

Below the usual flight operating range (say 2000-2600 RPM), the RPM Lever is mostly ineffective, and in these low power situations, such as taxying, the throttle controls engine RPM as before.
With the RPM lever fully forward, we say the prop is at MAX RPM or in FINE pitch. With the RPM lever fully rearward, we say the prop is at MIN RPM or in COARSE pitch.

3a: Order of Operation of Levers:

We now understand which levers control RPM and MP. However, when we want to make a change to either or both of these values, there is a specific order which MUST be adhered to, to prevent engine stress and possible damage.

When increasing power, the **BLUE (RPM)** lever must be advanced before the **BLACK (Throttle)**
When decreasing power, the **BLACK (Throttle)** lever must be retarded before the **BLUE (RPM)**

There are various ways to try to remember this:

Increase power – levers Right to Left Decease power – levers Left to Right	Blue UP, Black Down	REV UP – POWER DOWN

However you remember, it is important to get the order right, so every time you touch the levers, stop, think and make sure you know what you are going to do.

4: Typical Operation:

We will now go through a typical flight profile, taking the Piper Arrow as our example, although very similar figures will apply for other aircraft.

4a: Pre Flight:

On the ground, with the engine shut down, the RPM will be reading zero, fairly obviously, and the Manifold Pressure gauge will be reading atmospheric pressure in inches of mercury (Usually about 29-31” at sea level but decreases by 1” per 1000’ as you gain altitude or elevation).

The RPM lever should be in the fully forward/Fine/Max RPM position when you enter the aircraft.

After engine start, the RPM should be kept at around 1000-1200 RPM (see PoH) using the throttle alone. The RPM lever will remain at MAX throughout the taxy phase.

RPM lever should be fully forward when you enter the aircraft.

4b: Power Checks:

Power checks are carried out as shown in the checklist or PoH. The power is increased to 2000 RPM (1700 for Cessna 182) using the throttle alone. RPM lever remains at MAX. When the check of the propeller governor is reached, the Blue RPM lever is cycled to MIN RPM and back to MAX 3 times, accompanied by a change in engine note. It should take about 3-5 seconds to cycle the lever there and back, and each time we do this, we are looking at a different gauge for verification.

1: **RPM decreases and returns to initial value of 2000/1700 RPM. Try not to let the RPM reduce by more than 500 RPM during the check.**
2: **MP increases and returns.**
3: **The oil pressure (which moves the propeller blade) shows a change in pressure.**

After the power checks, the RPM lever should be returned to MAX for take-Off.

4c: Take Off:

For take-off in a non turbo charged engine, all levers – Throttle, RPM & Mixture should be fully forward. In a turbo charged engine, a maximum MP will be stated (and must be observed).
Monitor oil temperatures, pressures and MP (in a turbo-charged) engine during take-off.

Above we see the levers and MP/RPM readings during take-off in an Arrow III. Note the Fuel Flow

And here at Climb power

4d: Climb Power:

Although it is permissible to climb at full take-off power, on most variable pitch propeller aircraft, a reduced power is often set after take-off. This is known as climb power. Climb power is usually set at a safe height, when initial obstacles have been cleared, often 500 - 1000' agl.

On the Piper Arrow, climb power is 2500 rpm & 25" MP. This is usually abbreviated to 25/25 or 25 squared.
Remember, when setting climb power, that there is an order of levers. As we are reducing power, we move the throttle first (large lever movement) then RPM (very small lever movement).

On the Cessna 182, climb can be at full power or at 2400 RPM/23" MP (24/23).

4e: Climb:

During the climb, the RPM will stay at whatever value you set with the RPM lever (it is a constant speed prop). However, as atmospheric pressure drops by 1" for every 1000' altitude gained, the MP will fall by 1" for each 1000' climbed. So, it is important to continually move the throttle forward in the climb to maintain the MP, otherwise the power output of the engine will decrease. Eventually, full throttle will be needed to maintain climb power. This is known as 'full throttle height'. It is typically around 5-6000'. Further climb will result in the loss of climb performance. In a turbo charged aircraft, the full throttle height will be much higher than for a normally aspirated engine.

4f: Cruise:

In the cruise, you must select a suitable cruise setting. A typical setting for the Piper arrow is 2300/23" (23 squared). The PoH will recommend a selection of different cruise settings depending on speed and range requirements.
Again, when we come to set cruise power after levelling off after a climb, this will involve a reduction in power, so the throttle is retarded before the RPM lever.

Power Setting Table for Lycoming Model IO-360-C1C6
Engine as Installed in PA-28R-201 Arrow Best Economy Mixture

POWER SETTING TABLE (Best Economy)

Pressure Altitude	ISA Temperature		55% Power 110 BHP @ Propeller Mixture Peak EGT Manifold Pressure - In. Hg		65% Power 130 BHP @ Propeller Mixture Peak EGT Manifold Pressure - In. Hg		Pressure Altitude
Feet	°F	°C	2200 RPM	2500 RPM	2200 RPM	2500 RPM	Feet
S.L.	59	15	24.8	22.2	27.5	24.5	S.L.
1000	55	13	24.4	22.0	27.1	24.3	1000
2000	52	11	24.0	21.8	26.7	24.1	2000
3000	48	9	23.7	21.5	26.3	23.8	3000
4000	45	7	23.3	21.3	26.0	23.6	4000
5000	41	5	22.9	21.1	25.6	23.3	5000
5250	40	4	22.8	21.0	F.T.	23.2	5250
6000	38	3	22.5	20.8		23.1	6000
7000	34	1	22.1	20.6		22.8	7000
8000	30	-1	21.8	20.4		22.6	8000
8750	28	-2	21.5	20.2		F.T.	8750
9000	27	-3	F.T.	20.1			9000
10000	23	-5		19.9			10000
11000	19	-7		19.7			11000
12000	16	-9		F.T.			12000

← Some suggested cruise settings for the Piper Arrow.

Cruise table for the Cessna 182Q →

CRUISE PERFORMANCE
PRESSURE ALTITUDE 4000 FEET

CONDITIONS:
2950 Pounds
Recommended Lean Mixture
Cowl Flaps Closed

NOTE
For best fuel economy at 65% power or less, operate at the leanest mixture that results in smooth engine operation or at peak EGT if an EGT indicator is installed.

		20°C BELOW STANDARD TEMP -13°C			STANDARD TEMPERATURE 7°C			20°C ABOVE STANDARD TEMP 27°C		
RPM	MP	% BHP	KTAS	GPH	% BHP	KTAS	GPH	% BHP	KTAS	GPH
2400	22	- - -	- - -	- - -	76	139	13.0	73	140	12.5
	21	74	135	12.6	71	136	12.1	69	136	11.7
	20	69	131	11.8	66	132	11.3	64	133	11.0
	19	64	127	10.9	62	128	10.6	60	128	10.2
2300	23	- - -	- - -	- - -	76	140	13.1	74	141	12.6
	22	75	135	12.8	72	136	12.3	70	137	11.9
	21	70	132	12.0	68	133	11.5	65	134	11.2
	20	66	128	11.2	63	129	10.8	61	130	10.4
2200	23	75	135	12.8	72	136	12.3	70	137	11.9
	22	70	132	12.0	68	133	11.6	66	134	11.2
	21	66	129	11.3	64	129	10.9	61	130	10.5
	20	62	125	10.5	59	126	10.2	57	126	9.8
	19	57	121	9.8	55	121	9.5	53	121	9.2
2100	23	70	132	11.9	67	133	11.5	65	133	11.1
	22	66	128	11.2	63	129	10.8	61	130	10.4
	21	62	125	10.5	59	126	10.1	57	126	9.8
	20	57	121	9.8	55	121	9.5	53	122	9.3
	19	53	117	9.2	51	117	8.9	50	117	8.7
	18	49	112	8.6	47	112	8.3	46	112	8.1
	17	45	107	8.0	43	107	7.8	42	106	7.6

← A twin engined aeroplane set at 22 squared in the cruise

4g: Descent:

During the descent, the RPM lever is often left at the cruise setting. Indeed, it can remain there until shortly before landing. However, the MP will need to be reduced continually. Remember, in the climb, how the MP reduced by 1" for every 1000' climbed? Well the reverse happens during descent, so every 1000' or so, inch the throttle back to keep the desired MP.

In larger engines, say over 200 HP, such as the Cessna 182, care should be taken to avoid shock cooling of the cylinders. This is best achieved by only reducing the MP slightly. A typical minimum of 20" will help, and an absolute minimum of 15" if needed. Cylinder Heat Temperature (CHT) can be monitored in descent to check that cooling is not too rapid.

4h: Landing:

The propeller will perform quite happily during landing at most RPM settings, however in case of a go-around, maximum RPM will be needed. For this reason, prior to every landing, the RPM lever should be moved fully forward. This can either be done as part of the Pre-Landing checklist (typically downwind), or on base leg or on finals. The best time to do this is when the throttle is at a low setting, as this reduces the unwanted noise change associated with the increasing engine RPM. For this reason, I recommend advancing the RPM lever to MAX once descent has begun on the base leg.

Once established on short finals, we should always ensure that the RPM lever is set to MAX by doing our **Red, Blue, Green Checks**:

- REDS Mixture(s) Fully Rich
- BLUES Propeller(s) Max RPM
- GREENS Gear Down, 3 Greens

4i: Go Around:

Since we moved the RPM lever to MAX on finals (or before), should a go-around be necessary, the lever is already in the correct position. Just advancing the throttle is needed to achieve go-around power.

4j: After Landing:

The RPM lever should be left at MAX until and after shutdown.

5: Abnormal Operations

There are 2 main things that could go wrong with the constant speed propeller:

- **Loss of oil pressure:** How a loss of oil pressure affects the constant speed prop, generally depends on whether you are in a single or multi engined aeroplane. In singles, a loss of oil pressure usually drives the propeller to high RPM (low pitch) to allow the engine to supply maximum power in the event of a failure. In a twin, the propeller will normally feather – drive to low RPM (high pitch) to reduce drag.
- **Propeller Overspeed:** Normally a matter of trying to control the prop as best you can. Often a checklist in the manual.

PA28R-201 Arrow III: PROPELLER OVERSPEED

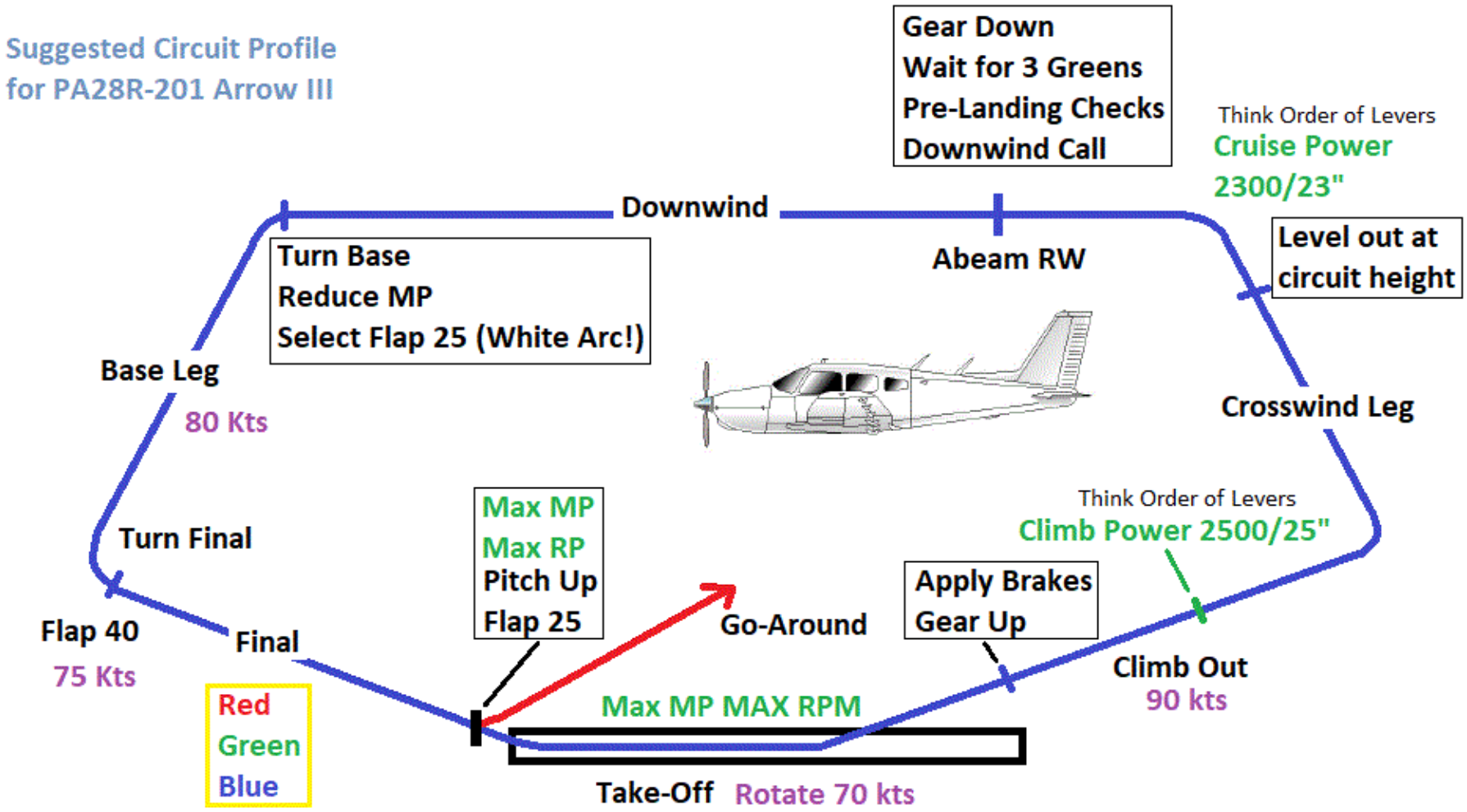
1.	Throttle	**RETARD**
2.	Oil Pressure	**CHECK**
3.	Propeller Control	**FULL DECREASE RPM**. Then set if any control available.
4.	Airspeed	**REDUCE**
5.	Throttle	**AS REQD TO KEEP BELOW 2700 rpm**

6: Suggested Flight Profile for Training

A typical training flight will involve:

- External Checks to include propeller and engine
- Familiarisation of the cockpit controls and indicators.
- Power Checks including propeller RPM check
- Selection of climb power after take-off
- Cruise power settings
- Descent management
- Propeller overspeed considerations
- Return to the airfield for touch and go training.

8: Suggested Circuit Profile for PA28R-201 Arrow 3



Tailwheel Differences Training

General

In order to extend a pilots privilege to another variant of aircraft within one class or type rating, the pilot shall undertake differences or familiarisation training

GM1 FCL.710

(a) Differences' training requires the acquisition of additional knowledge and training on an appropriate training device or the aircraft
(b) Familiarisation training requires the acquisition of additional knowledge

A pilot wishing to fly a tail wheel aeroplane is required to complete Differences Training to the satisfaction of an appropriately qualified instructor. The type and content of the Differences Training is given in CAP 804

Pre-Course Entry Requirements

Before beginning a course of training the applicant shall hold:

(a) NPPL(A), LAPL(A), PPL(A), CPL(A) or ATPL(A)
(b) SEP (land) Class Rating or SSEA (as applicable)
(c) Medical Certificate appropriate to the licence held

Ground Training

The ground training consists of 2 hours of ground instruction on subjects associated with tail wheel operations including:

Physical differences
Loading and Effect of CG Position
Dynamic differences and handling during:

Ground handling
Starting and taxiing
Taking-off
Engine failure during take-off
Landings including 2-point "wheelers" and 3-point landings
Crosswind operations
Parking and mooring

Type specific training to include:

Take-off and climb performance
Cruise performance
Landing performance
Speeds for normal operation
Speeds for emergency operation
Airframe and manoeuvre limitations
Spinning
Stall/Spin warning
Fuel system
Engine systems and instrumentation
Undercarriage system
Electrical system
Cabin and environmental system
Flight instrumentation
Other systems including pneumatic, vacuum and hydraulic
Aerodynamic controls and handling characteristics
Engine handling
Flaps and trim systems
Emergency procedures

Flying Training

The flight training consists of a 5 hours of dual instruction covering the following:

Ground handling
Starting and taxiing
Taking-off
Engine failure during take-off
Visual circuit pattern
Landings including 2-point “wheelers” and 3-point landings
Crosswind operations
Parking and mooring

Skill Test

There are no formal tests on completion of the course of training

References

CAP 804
Part FCL, AMC and GM
The Complete Taildragger Pilot by Harvey S Plourde
Royal Air Force Manual Flying (AP3456) Principles of Flight (Volume 1)

Privileges

Permits a pilot to fly single engine tail wheel aeroplanes as PIC.
Note: To extend the privileges to multi-engine tail wheel aeroplanes requires further differences training.

Validity, Revalidation & Renewal

If the variant has not been flown within a period of 2 years following the differences training, further differences training or a proficiency check in that variant shall be required to maintain the privileges, except for types or variants within the single-engine piston and TMG class ratings.
The differences training shall be entered in the pilot’s logbook or equivalent record and signed by the instructor as appropriate.

Part 5: Appendices

Appendix 1: Instructional Techniques

Building Blocks

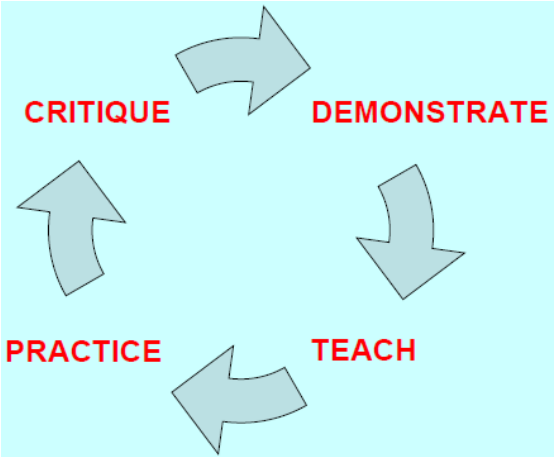
Several exercises can be broken down into smaller parts that can be mastered individually before being added together to create the finished product. Examples would be:

Turning, Climbing, Descending:	Entry. Maintaining. Rollout
Practice Forced Landings (PFL):	Initial Actions. Troubleshooting. Field Selection. Mayday. Approach Planning etc
Circuits:	Take-Off. Climb. Downwind. Base. Final. Go-Around etc

Known to Unknown

There is a huge amount of material that the student must absorb in the process of flight training, so it always a good idea to start with something that they are familiar with. For example, before teaching levelling out from a climb, make sure they are happy maintaining a climb first. Then you can add-on the new skill to the old. Afterwards, you can go back and teach the entry.

Circle of Learning



A continuous loop, whereby the student learns by

- Watching a demonstration of the manoeuvre by the instructor.
- The instructor teaches that manoeuvre by breaking it down and pattering it.
- The student practices the manoeuvre.
- The instructor offers feedback, which may entail another loop.

Following Through on the Controls

In the early lessons, it can be beneficial for the student to place their hands and feet lightly on the controls while the instructor demonstrates a manoeuvre. This way they can gauge the amound and rate of input required before having a go for themselves. A similar method can be used by asking the student to place one finger on the throttle, for example during stall recovery demonstrations. Remember to tell the student to 'Relax' when you no longer need them to follow you through.

Work Cycles

There are several useful work cycles in basic flight training that can make life easier for both student and instructor. Do not hesitate to keep repeating them whenever reinforcement is needed.

SELECT – HOLD – TRIM: Used when learning to trim the aircraft. It stops the student flying by trimwheel and makes them look outside.

LOOKOUT – ATTITUDE – INSTRUMENTS: A very useful cycle used in Straight & Levl, Climbing, Descending and Turning. It forces the attention outside, and reminds them to glance at their instruments.

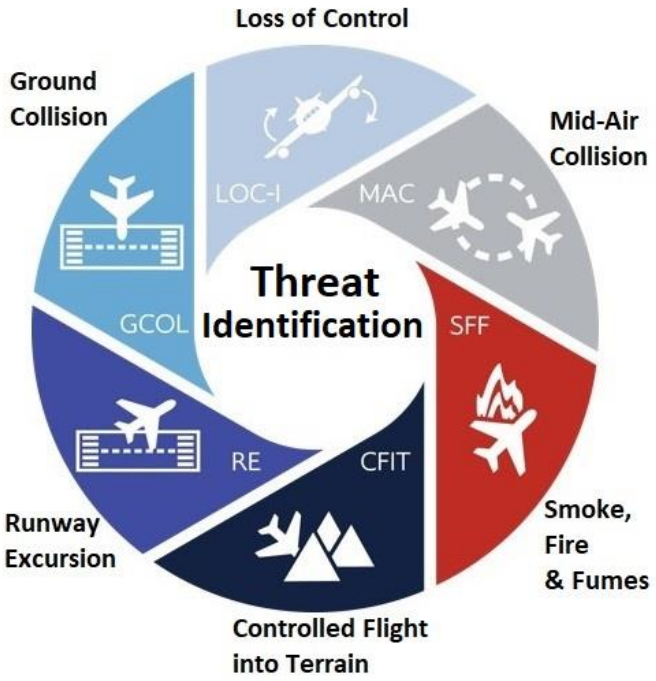
Threat & Error Management (TEM)

Examiners now want to see a thorough culture of TEM from all instructors and will expect frequent reference to be made to it. Not only should TEM be mentioned in ground briefings, but should then be referred to again in the air as relevant topics arise.

Make sure the student understands the diference between threats and errors: Threats are generally external to us and are present in our operating environment. Errors are usually internal to us – so human error and mistakes.

Threat Identification:

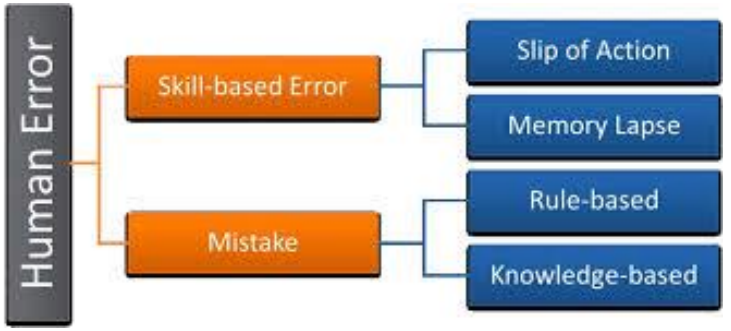
Try to elicit possible threats from the student either by asking open questions about the threats in the environment, or by guiding them with leading questions, or a model:



Identification of Errors:

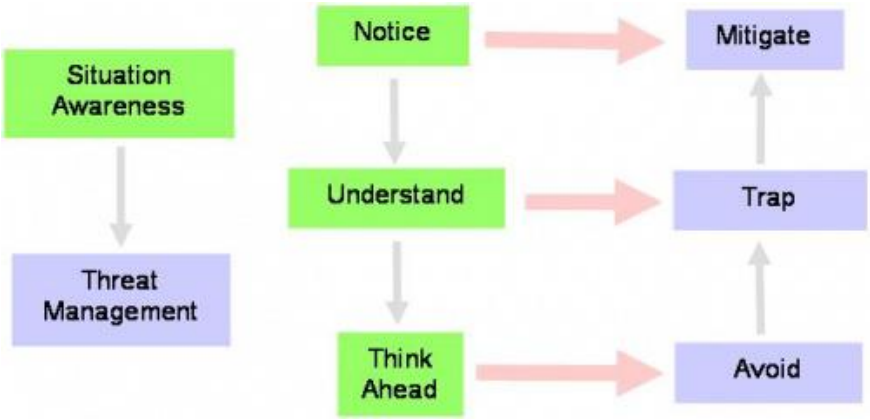
Depending on the experience of the student, it may be harder to identify errors. For example:

- Mis-set Altimeter or DI
- Airspace Infrincgement
- Forgetting to change fuel tanks
- Forgetting to carry out checks when required
- Forgetting to use Carb Heat on descent or forgetting to turn it off afterwards
- Joing for the wrong runway



Management:

Then when it comes to management of these threats and errors, it is important to suggest solutions. It is not enough to simply identify errors – they must be managed: avoided, trapped or mitigated. Once mentioned, try to revist these threats and errors frequently throughout the brief and flight. TEM can thus permeate the whole instructional process rather than just be a monotonous list at the beginning of a pre-flight brief.



Negative Training:

Avoid the use of negative training: Always tell the student what you want him to do, not what you DON'T want him to do. He may focus on these items instead of the primary task.

In the air, this can result in a poor instructional technique known as 'Instruction by Fault Analysis' where the instructor does not 'teach' the student what to do, he merely tells him that he is doing it incorrectly. This must be avoided at all costs.

Another example of negative training is flying around with the stall warner sounding during slow flight.

Debriefing:

- Debriefing is a very important, and often underused, part of the teaching process. It is important to consolidate the learning objectives from the lesson before the student goes home and forgets. Just 5 minutes of debrief time can be invaluable.
- Make sure the student writes something down during the debrief. A student listening to a long list of importantpoints without a pen and paper is not going to improve.
- A facilatative approach to debriefing is often a good ide, especially with more advanced students. Questions like the following can prove enlightening: How did you feel that went? What could you have done differently? What were your best and poorest parts?
- Do not make a debrief a long, chronological list of student faults. Pick one or two good points, and a few negative points and debrief those.

Appendix 2: Long Briefings

Introduction

A detailed explanation and discussion conducted by a qualified flight instructor and covering the major considerations of an air exercise. The normal length should be approximately 40-50 minutes and it may be given either as a tutorial to an individual student or as an informal lecture to two or more students.

Long briefings are frequently given to students on bad weather days, and there is a requirement in every instructor AoC to deliver one:

From CAA Standards Doc 10:

The Lecture or Long Briefing

- The instructor will be expected to give a long briefing or short lecture lasting approximately 30 to 40 minutes.
- The subject will be determined by the examiner and should be made known to the instructor not less than 2 days before the date of the assessment. Subject matter should be relevant and related to the appropriate instructional privileges and pilot training syllabus. Examiners should vary the subject matter so that it becomes a useful and challenging exercise for the instructor to research and prepare the lesson and not just repeat something that has been prepared and delivered as part of the course.
- Instructors should expect to give the long briefing or lecture to a small audience comprising the examiner and other student pilots or instructors. Instructors will be expected to demonstrate effective use of a variety of training aids and equipment. Therefore, prior preparation and practice with such equipment is essential.
- Sufficient time should be allowed at the end of the briefing or lecture for a reasonable number of questions from the audience. The examiner must ensure however, that this does not become a lengthy session or that the instructor is exposed to unreasonable questioning.

Typical Examiner Requested Long Briefs:

- The UK airspace system.
- Prohibited Areas, Danger Areas, Restricted Areas & NOTAMs. What, where and where to find the information.
- Light Aircraft take-off and landing performance.
- Mass & Balance.
- Variable Pitch Propeller Differences.
- Retractable Landing Gear differences.
- Pick any recent light aircraft accident and analyse using TEM.
- RT at UK aerodromes.
- Why do pilots land gear up?
- Avoiding infringement.
- The SEP (land) rating and how to keep it current.

Useful Tips:

- Have a handout like the one below available to give to students either before of after the lesson. This will enable them to either follow you through as you give the lecture, or to consolidate with afterwards.
- Have printed pictures and illustrations available for students to look at. They will be drawn much more professionally that you can draw freehand on a whiteboard.
- Ask yourself the following questions: Why did you decide on that title? Why did you choose the illustrations you did? Why did you choose to present it in this way?
- During FIC training, it is a good idea to introduce each pre-flight briefing or lecture with a relevant accident. This will make it more real and give purpose to the exercise.

Common Faults:

- Avoid talking and writing on the white board at the same time with your back to the student(s).
- Make sure you use an aircraft model and keep it correctly oriented for the student's benefit.
- Make sure you include the student(s) in any briefing or lecture. Use eye contact and ask questions.

Long Brief: Example 1:

WELCOME TO YOUR

AVIATION SAFETY MODULE

13 Jan 2024: **Instructor: Steve Pells**

Video 1 click left (internet required)

QUESTION 1:

What do the following incidents have in common?

1: 	**In 2018 a training aircraft at Blackbushe taxies into the fuelling building.** **On talking to the solo student afterwards, it transpires that he was looking at his phone whilst taxying.**
2: 	**On 29 Dec 1972, an Eastern Airlines Tristar crashed into the Everglades killing 101 people.** **The cockpit voice recorder provided evidence that all 3 crew members were engrossed in trying to check a faulty bulb on the gear position indicator.**
3: 	**After a busy departure from Blackbushe in 2018, a light aircraft flies all the way to France with the flaps in the take-off position.**

A common theme in all of these incidents is……

DISTRACTION

QUESTION 2:

WHAT IS DISTRACTION?

The Oxford Dictionary defines distraction as:

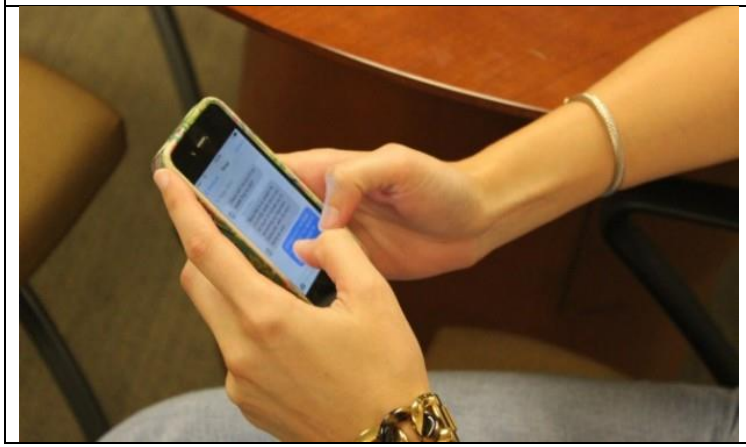
'a thing that prevents someone

from giving full attention to something else'

Does this sound like something

we want in aviation?????

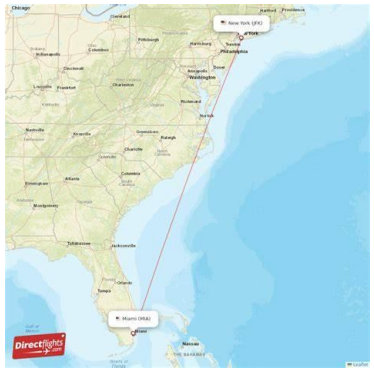
Let's look at the 3 incidents again in a bit more detail:

	**G-BZEA, a Cessna 152, was being taxied by a student on a solo exercise.** **As it passed close to the refuelling building there was a crunching sound and the aircraft came to a halt.**
	**The student got out and found damage to the wing leading edge.** **He then taxied back to parking.**
	**His instructor asked him what had happened.** **He said it wasn't his fault as he was sending a text message on his phone at the time.**

How do you think this incident could have been prevented?

Turn your phone off before getting into the aircraft.
Do not allow yourself to be distracted from the primary job of controlling the aircraft.
Remember who is responsible!!
Concentrate on the job at hand.
Even taxying is a critical stage of flight!!

Eastern Air Lines Flight 401 was a scheduled flight from New York JFK to Miami.



Shortly before midnight on Dec 29, 1972, the Lockheed TriStar crashed into the Florida Everglades, causing 101 total fatalities.
3 of the 4 cockpit crew members, 2 of the 10 flight attendants, and 96 of the 163 passengers were killed; 75 people survived.

The crash occurred while the entire flight crew were preoccupied with a burnt-out landing gear indicator light.

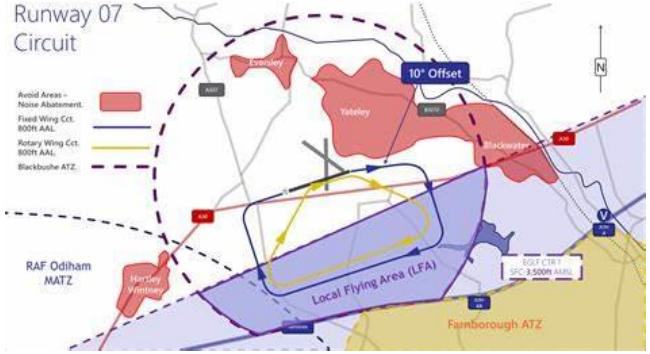
The captain accidentally bumped the control yoke on the aircraft, causing it to turn off the autopilot.
Due to the focus on the landing gear, the pilots didn't notice.
Because of this, the aircraft gradually lost altitude and crashed.

How do you think this accident could have been prevented?

One person could have been designated to watch the aircraft flight path.

This would have allowed the other crew members to focus on the problem with the gear light.

G-OSUS, a Mooney 230, was being flown from Blackbushe to Le Touquet, France.



On departure, the circuit was busy and a Farnborough transit was required. This led to a lot of RT work.

The after take-off checks were not completed.
On selecting flaps for the approach into Le Touquet, it was discovered that they were already at the take-off position.

How do you think this incident could have been prevented?

Strict checklist discipline could have prevented this from happening.

Regular FREDA checks could be widened to take in the whole aircraft state, including flaps and landing gear.

Think ahead and identify busy times of flight and have a system to manage workload.

Now let's remind ourselves about:

TEM:

Threat & Error Management

Threats:

What do we mean by Threats?

Threats can be defined as situations or events that have the potential to have a negative effect on safety.

Threats can be classified as internal or external.

Internal threats are related to the individual – they are about YOU

Can you think of some examples of INTERNAL Threats?

Examples of internal threats are:

- fatigue
- experience
- personal attitude
- lack of recency and proficiency
- health and wellbeing.

External threats can relate to the context of the operation and therefore can be different depending on the situation.

Can you think of some examples of EXTERNAL Threats?

Examples of external threats are:

- adverse weather
- high terrain or obstacles
- night operations
- other traffic
- equipment faults
- remote strips/landing sites
- weight and balance issues
- airspace design
- airport layout
- co-ordination
- communication failure
- navigation aids confusion
- other traffic
- visibility/weather issues.

Errors:

What do we mean by Errors?

Errors can be defined as actions or inactions which can lead to:

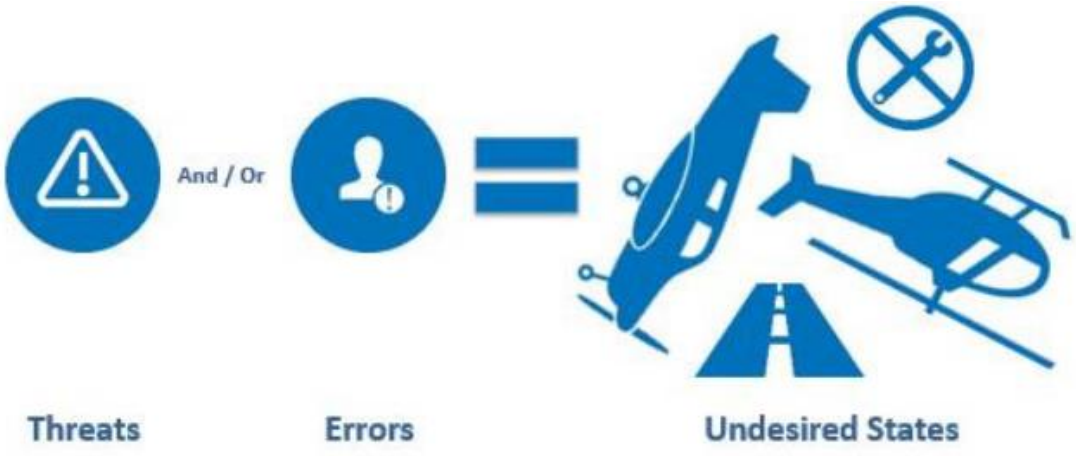
- a deviation from intentions or expectations
- reduced safety margins
- increased probability of undesirable events occurring.

Errors can be classified as **slips**, **lapses**, or **mistakes**, and are generally considered **unintentional**.

Can you think of some typical errors that could be made in aviation?

Typical errors may include:

- **incorrect calculations**
- **inaccurate planning**
- **non-standard communications**
- **incorrect altimeter setting**
- **incorrect systems operation or management, ie, selecting the wrong switch**
- **procedure or checklist errors.**



Threat and/or errors can lead to undesired states

Where do you think DISTRACTION fits into this framework?

Remember the ways we can MANAGE threats and errors:

AVOID

Take steps to avoid the error – prior planning etc

TRAP

Trap the error early on – maintain good situational awareness

MITIGATE

Reduce the consequences of the error

Now let's revisit each of the scenarios and see how we could manage distraction.

	**AVOID:** **TRAP:** **MITIGATE:**
	**AVOID:** **TRAP:** **MITIGATE:**
	**AVOID:** **TRAP:** **MITIGATE:**

What can cause a distraction whilst operating an aircraft?

- Passengers
- Instructor
- Student
- Air Traffic Control
- Other aircraft
- Weather

Have you ever been distracted while operating an aircraft?

Tell us what happened and how you managed the situation.

What will you do in future to manage distraction?

Video 2 click left (internet required)

Any Questions?

What Will You Take Away from this Module to make you a better pilot?

Long Brief: Example 2:

Loss of Control in Basic Flight Training

A study in **Threat and Error Management** in light aircraft training accidents

Stephen Pells 28Mar23

We are used to discussing threats and errors every time we go flying, so let's have a quick recap:

What are threats & errors?

Threats:

Threats can be defined as a situation or event that has the potential to have a negative effect on safety. Threats can be classified as internal and external. Internal threats are related to the individual.

Examples of internal threats are:

- **fatigue**
- **experience**
- **attitude**
- **lack of recency and proficiency**
- **health and wellbeing.**

External threats can relate to the context of the operation and therefore can be different depending on the situation. Examples of external threats are:

Pilot Related Threats

- **adverse weather**
- **high terrain or obstacles**
- **night operations**
- **other traffic**
- **equipment faults**
- **remote strips/landing sites**
- **weight and balance**

ATC & Weather Related Threats

- **airspace design**
- **airport layout**
- **co-ordination**
- **communication failure**
- **navigation aids**
- **traffic**
- **visibility/weather.**

Errors:

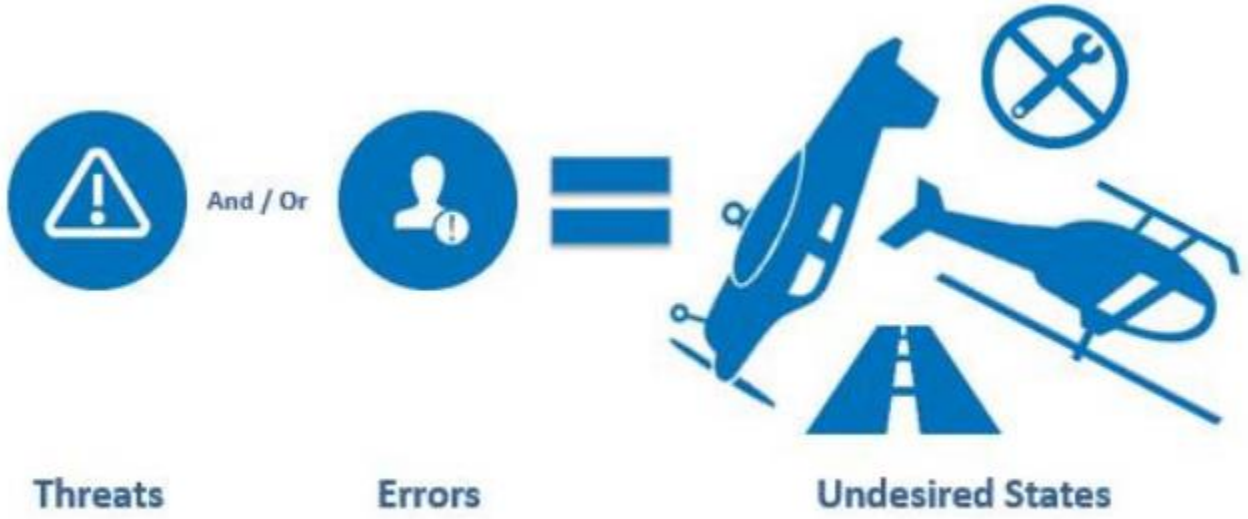
Errors can be defined as actions or inactions which can lead to:

- a deviation from individual or organisational intentions or expectations
- reduced safety margins
- increased probability of undesirable events on the ground and/or during flight.

Errors can be classified as **slips**, **lapses**, or **mistakes**, and are generally considered unintentional.

Typical errors may include:

- **incorrect calculations or input errors**
- **inaccurate planning or scheduling**
- **non-standard communications or handovers**
- **mishandling the aircraft/equipment**
- **incorrect systems operation or management, ie, selecting the wrong switch**
- **procedure or checklist errors.**



Threat and/or errors can lead to undesired states

Some Threats and Errors seen during basic flight training:

1: Loss of Control

2: Mid-air collision

3: Runway Incursion

4: Runway Excursion

5: Infringement

How does loss of control arise during flight training?

More importantly, how do we try to prevent loss of control?

Play Video Clip

Internet connection required

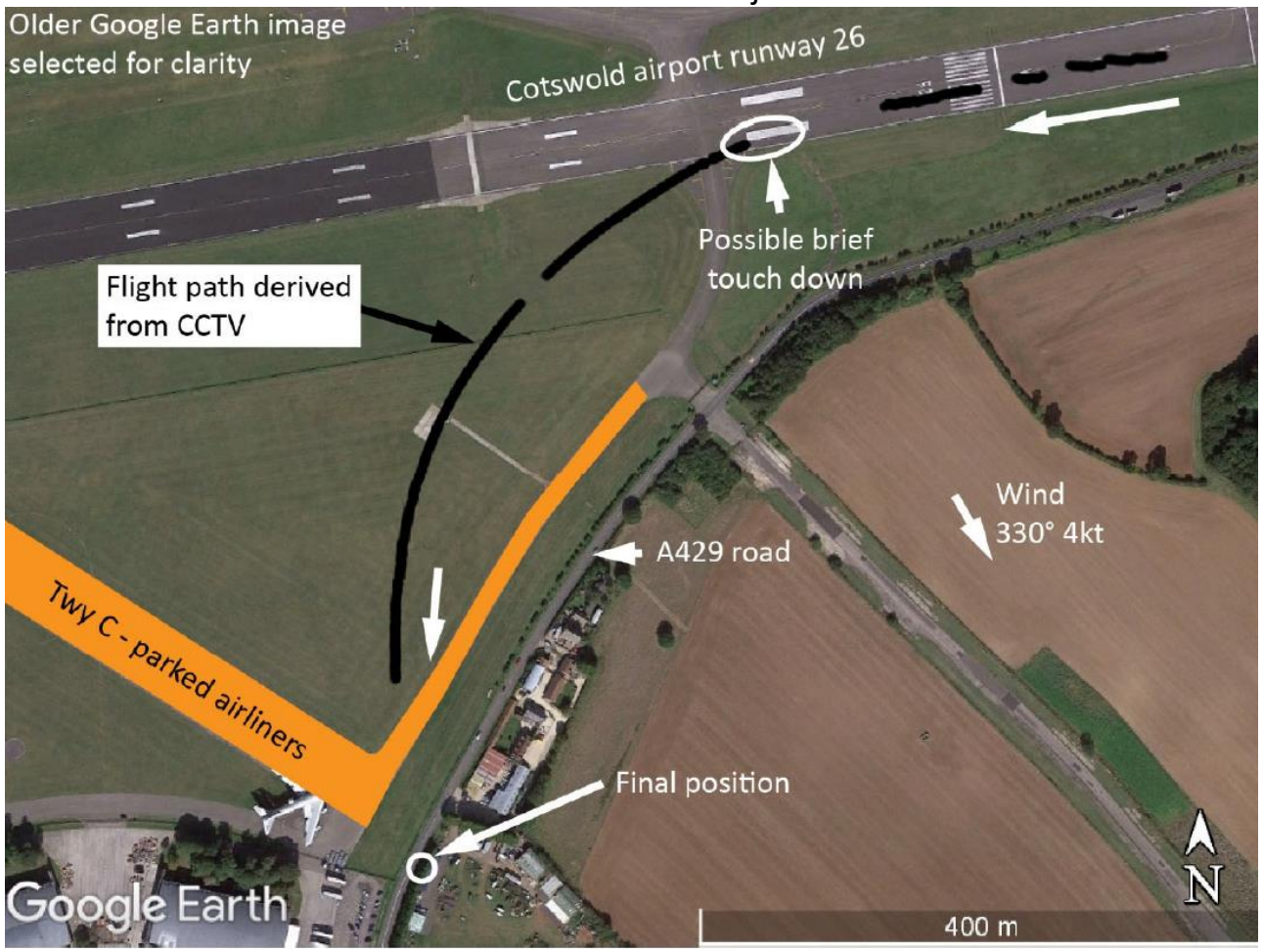
But fighting over the controls couldn't really cause an accident, could it???

https://www.youtube.com/watch?v=O8c57u3wYk4

Internet connection required

On 04 Aug 2022, a PPL student and their instructor went to Kemble airport to practice some circuits in a PA28-140.

During an attempted go-around the aircraft veered left from the runway track. The instructor was unable to establish a climb and the aircraft touched down approximately 350 m from the end of the runway, tracking approximately perpendicular to the left of the runway track. As the aircraft touched down it passed between two parked, out of use, airliners and its right wing tip struck the nose landing gear of one of the parked aircraft. The outer portion of the right wing was severed and the aircraft continued across the grass. It passed through the airfield perimeter fence, crossed the A429 road and came to rest in a ditch adjacent to the road.



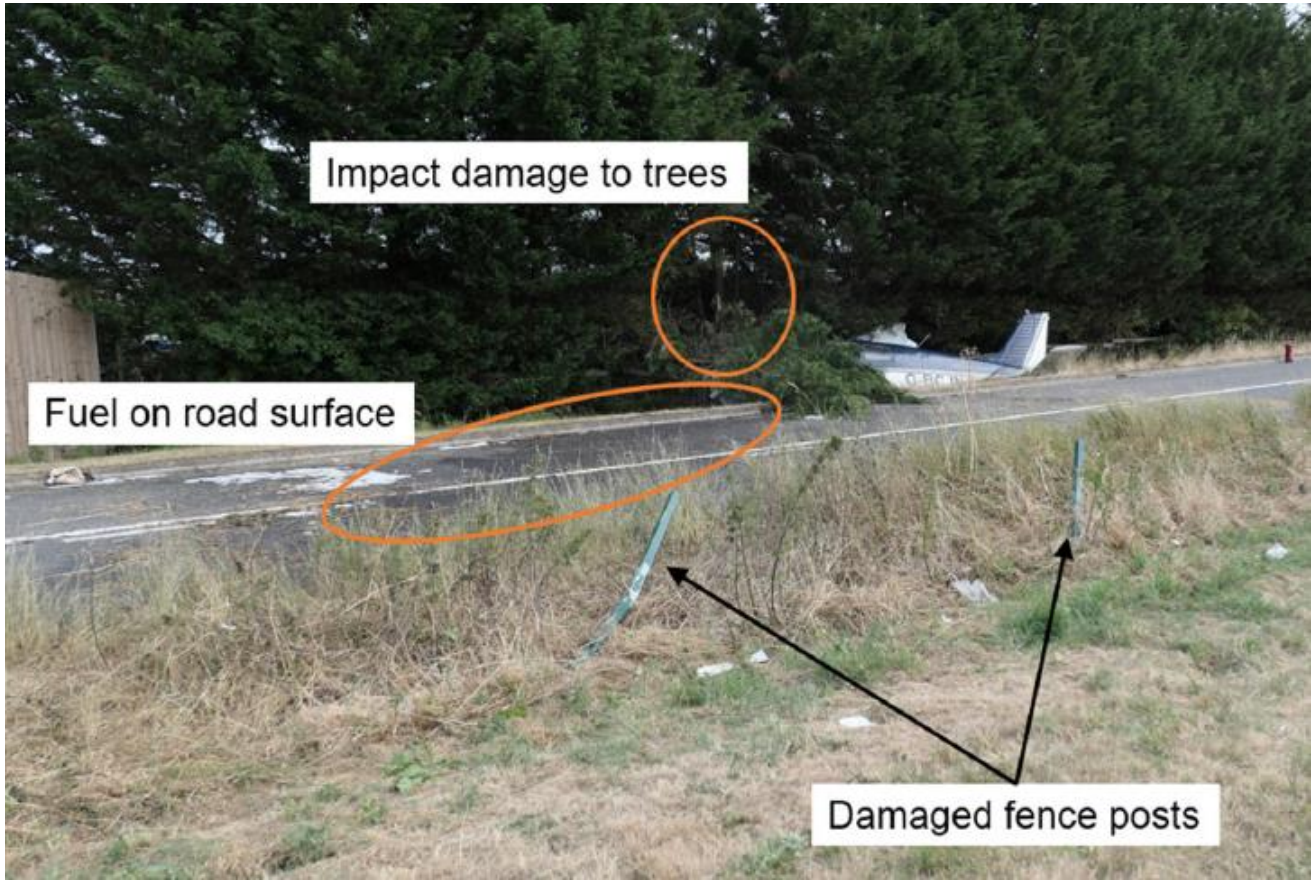
But Why???????

The instructor recalled stating "**I have control**" at approximately 100 ft agl.
He applied full power and retracted the flaps to 25° which is standard for a go-around.
At this point the airspeed was approximately 60 kt whereas the planned approach speed was 70 kt.
As the instructor applied power, he recalled the aircraft pitching up more than he expected and rolling left.

The instructor noticed that the student was continuing to make control inputs.

He described using explicit language to encourage the student to fully relinquish control.

The instructor did not recall the student stating "**you have control**" at any point nor did he recall stating "**I have control**" a second time.



The accident report has this very interesting sentences:

'Both pilots felt the other continue to make control inputs and there was confusion between them as to what actions were being taken.

As a consequence, the go-around was not effectively instigated.'

Luckily, neither pilot was injured.

How can we stop this happening again?

- **Always know who has control**
- **Always release the controls on hearing 'I have control'**
- **If in doubt check**

Further Reading

A copy of the AAIB report into the accident of PA28 G-BCJN contains the full details and is available free for download.

https://www.gov.uk/aaib-reports/aaib-investigation-to-piper-pa-28-140-cherokee-g-bcjn

Appendix 3: Pre-Flight Briefings (Short Briefings)

Introduction

The student has already either had a long brief on the subject, or self studied, so the purpose is not to teach the theory, but to provide a punchy overview of the entire flight that is about to take place, including pre-flight and post flight duties. It should leave the student in doubt about who will be doing what during the exercise.

In this regard, I am always reminded of the following limerick:

A gay man who lived in Khartoum,
Took a lesbian up to his room,
They argued a lot,
About who should do what,
And how, and with what, and to whom.

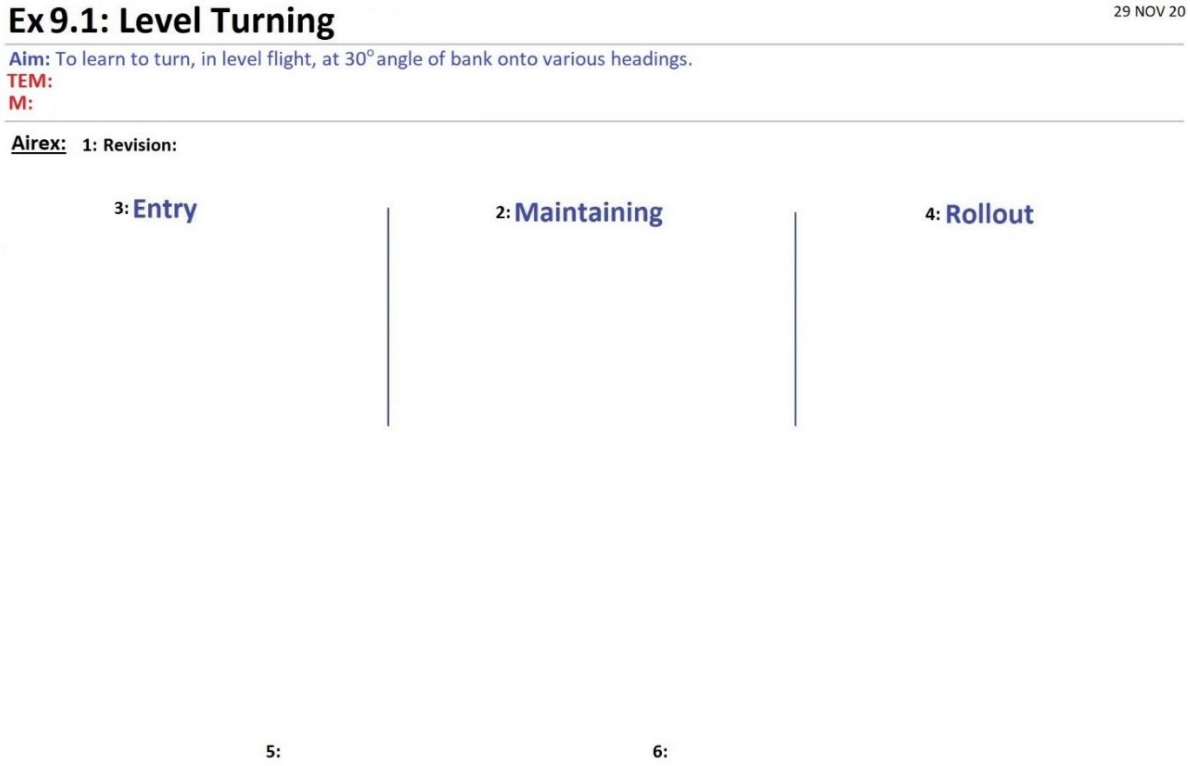
Although undoubtedly silly, it does get to the crux of the point of a short briefing! Note, not once do the participants use the word 'we'. 'How' is the most importand word of all.

The briefing normally includes a statement of the aim and brief allusion to principles of flight only if relevant. An explanation is to be given of the air exercises which are to be taught by the instructor and practised by the student during the flight. It should include how the flight will be conducted with regard to who is to fly the aeroplane and with what airmanship, weather and flight safety aspects which currently apply. The nature of the lesson will govern the order in which the constituent parts are to be taught.
The four basic components of the briefing will be:
1. The aim
2. Principles of flight (briefest reference only)
3. Threat & Error Management TEM.
4. The air exercise(s) what, and why and how and by whom.

Preparation

Make sure everything you need to deliver the pre-flight brief is available. There is nothing worse than an instructor having to leave the room to look for models or other aids. Even if this means delaying the start of the briefing, get everything together and ready, including the notes you will be using during the briefing.

Before starting the briefing, write the first part of the briefing on the board. Leave marks and spacers where you will write the remaining text, otherwise crowding can occur.



Do this in silence. Remember, NEVER talk to the student(s) while your back is turned and you are writing.

For example in Ex 9.1 you could prepare this part and lead the students through what follows.

Writing in CAPITALS rather than *cursive script* can be more legible to a class, depending on how neat your writing is. But avoid too many capitals.

Do not under-estimate the effectiveness of <u>underlining</u> something.

Do not be afraid to use abbreviations on your board briefing, as long as they have been explained: eg: clb for climb, Att for Attitude etc. Little diagrams are helpful too such as a mini balance ball  for balance, or pair of eyes  for lookout. This will make the board look more appealing than one covered with words.

Use colour consistently, with **RED** being used for importand things or danger.

<u>Build Up The Brief</u>

From Exercise 6 onwards, it can be a good idea to address the question as to WHY we are doing each lesson, as it is not always obvious to the student. 'Why are we learning to fly S&L?' 'Because when we are flying somewhere far away, the majority of our flying will be S&L.'

Make sure the student knows what the difference between a threat and an error is. Then, elicit the threats and possible errors from the students that you want, by guiding your questions: eg: 'what possible threat could we have on a busy weekend in the local area?' or 'what possible errors could we make when using the altimeter?' Just asking 'what threats are there today' could create all sorts of answers, many of them not relevant to the direcion you want to lead them. Then in the 'Management' row, add solutions to these threats and errors. It is not enough to simply identify errors – they must be managed: avoided, trapped or mitigated. Once mentioned, try to revist these threats and errors frequently throughout the brief and flight. TEM can thus permeate the whole instructional process rather than just be a monotonous list at the beginning of a pre-flight brief.

Outline how the flight will begin and who will do what to get the aircraft airborne. Use the words I and YOU (see below).

The use of colour on the board is important. Do not write everything in the same coulur. Have a system. **Red is useful for important or dangerous things.**

Then build up the rest of the board briefing by using building blocks. In this case begin with the 'Maintaining' building block. Then move onto the 'Entry' etc. Remember talk to the students, then turn and write in silence, then turn back and talk.

Remember to ask question regularly to prevent 'instructor drone-on'. An interactive and facilitative style is much preferable.

Talk about **HOW** things will be done, not just what will be done: 'I will enter the turn using co-ordinated input on the rudder and ailerons.'

Although it can be difficult at times, avoid the use of **WE** as much as possible. Use **I** and **YOU**. For example: 'I will fly the aircraft to the local area, where you will carry out a FREDA check. Then I will demonstrate how to carry out a HASELL check. You will then have a chance to practice.'

Make sure you use the word 'Teach' as appropriate. Many instructors say they will demonstrate a manoeuvre then the student will practice. There needs to be an element of teaching, after all, that is what an instructor does! Remember the Circle of Learning.

Avoid the use of negative training: Tell the student what you want him to do, not what you DON'T want him to do. He may focus on these items instead of the primary task.

Use of Visual Aids

Try to incorporate models and visual aids as much as possible. Always use the airraft model for all pre-flight briefings, especially when under assessment.

When holding the aircraft model, always orient the model so that it appears the correct way round for the student rather than the instructor.

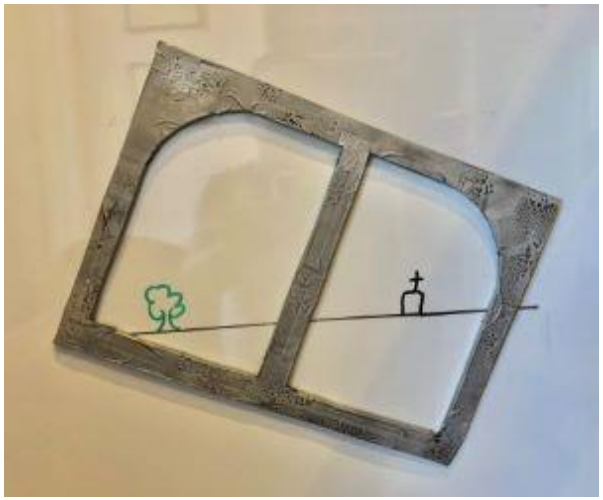
Which of these instructors has mastered the technique?

Actual aircraft instruments make very compelling teaching aids:

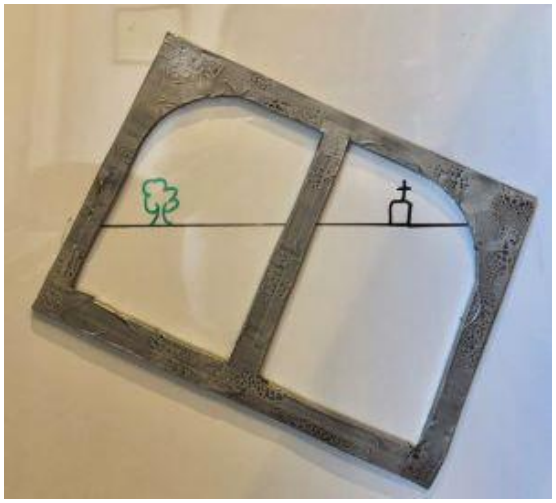
But having blown up diagrams of cut-away instruments allows you to explain their operation in more detail.

An aircraft window cutout can be used very effectively to show changing attitudes without having to redraw:

Straight & Level



Level turn to the right



Descending turn to the right

These can be made easily from cardboard, and if your whiteboard is magnetic, small magnets can be attached to the cutout to make it stay in place.

When showing changes in attitude using the cutout, be sure to exaggerate the changes to make them more visible to the student.

Appendix 4: CRI Groundschool

Teaching & Learning

There is a requirement for the trainee instructor to have a minimum of 25 hours of **Teaching & Learning** Groundschool. A suggested breakdown is as follows:

1. The Learning Process	
Motivation for Learning	Establish why the student wants to learn. It makes a huge difference to their performance if they actually want to learn. Common motivations include: Self-improvement, Career goal, Personal achievement, Financial reward, Desire to please family or employer.
Incentives to Learning	Learning is always easier if there is some reward at the end. Find out what the student is looking forward to. Common incentives include: Self-improvement, Career advancement, Personal improvement, Financial reward, Desire to please family.
Obstacles to Learning	Find out if there are any special needs. Medical, for example dyslexia is common in trainee pilots. Disability, airsickness, vertigo, phobias. Finance and time availability can also be huge obstacles. Aptitude, or lack of aptitude can also be a considerable obstacle. Remember, students need to be physically, mentally and emotionally ready to learn.
Learning Methods	Everyone learns in a different way: Some students are happy to self-study using on-line resources and books. Some students will need more intensive one on one teaching. Most will be in the middle. Some students like to understand everything and relish formulae. Others are happy to accept certain facts and move on. Some students need visual aids and lack the ability to create mental models easily. Others are good at this.
Rates of Learning	Each student will have a natural pace of learning. Establish that pace early on and don't try to push them to accelerate too much. This is easy for one on one learning, but in a group can cause problems.
Perception & Understanding	Students will find different topics harder or easier than you did when you were learning. Remember everyone is different and learns in their own way. It is your job to harness the student's ability.
Memory and its Application	People remember things in different ways. You may need to use inventive methods to solidify a concept or routine. Acronyms can be a good way. As can cockpit flows. Others prefer to count the number of actions.
Habits & Transfer	Remember, the student will watch you like a hawk in the early days, so it is vital that you don't let them mimic any bad habits that you may have. Strive to uphold the highest standards at all times.

2. The Teaching Process	
Elements of Effective Teaching	What makes a good teacher? Think of examples from your and their history. Why are some teachers better than others? **Enthusiasm:** Keen to get on with the job and do it in a positive manner. Enthusiasm is contagious. On the other hand, a lack of enthusiasm will sow the seeds for similarly negative attitude in your students. **Patience:** Many of your students will need to have procedures and techniques explained to them time and time again. Even though you may feel that you are 'banging your head against a brick wall' you must remain patient. Patience is especially needed when dealing with inexperienced, forgetful or underconfident students. **Sincerity:** Takes an interest in his student's progress both on the ground and in the air. Having an open and honest attitude with the student which will gain respect and confidence. Lies, half-truths and false write ups will undermine trust, destroy the instructor/student relationship and obstruct the student's ability to learn. **Adaptability.** An instructor must be adaptable or flexible as every student is different and requires a different approach. **Fairness:** An instructor never shows favouritism - do not be over friendly with one student and distant with another. **Honesty:** Instructors never bluff - if you need to discipline a student or threaten to take action, then do it. Do not make threats that you have no intention of carrying out. If an instructor does not know the answer to a question, then he says so. An instructor admits to his own mistakes. He never blames others and to admit that 'you were right and I was wrong' does much to improve the relationship with your student. **Considered:** An instructor does not make quick 'on the spot' judgements. When assessing a flight, he should take some time to think it over so that good points as well as bad points are considered. A balanced view will give an assessment that is valid and reliable. **Decisive:** They consider all the factors so that they make correct decisions and then act upon them. **Interested**: A good instructor is interested in his students and lets them know this by taking an interest in their backgrounds, problems, achievements and ambitions. **Motivating:** Good teachers tend to be able to motivate well. So, the key to being an effective teacher, is often how to motivate the student (see the Learning Process).
Planning of Instructional Activity	It is important to have a well-structured plan for lessons and for the overall course. This takes time and will involve the preparation of course content and teaching aids. Avoid having multiple sessions of the same kind of instruction - mix up between flights, lectures, practice sessions and hands-on learning if possible.
Teaching Methods	There are many ways to teach, just as there are many ways to learn. Which methods are used will in part be decided by the instructor, and in part by the needs of the student.
Known to Unknown	See Appendix 1: Instructional techniques
Use of Lesson Plans	Rather than make things up as you go along, it is much better to have a lesson plan which will keep you on the correct track. Use pre-prepared documents and teaching aids.

3. Training Philosophies	
Value of a Structured (approved) **Course of Training**	A structured course of training is always better for everyone - The student knows what is coming next, and the instructor can use it to keep him on track. If training at an ATO or DTO, there should already be an approved course of training for most courses. Outside such an establishment, the instructor needs to have a framework. Time should be taken to work out a syllabus that can be followed. Basic topics can then be expanded by group discussion or examples from real life instruction. A good FIC instructor will always have a good supply of stories to share.
Importance of a Planned Syllabus	Flying training is a complex business, and the well-defined syllabus that has been developed over the years, helps everyone understand the path that needs to be followed. Use either a commercially available course book, or devise one of your own and distribute it to the students beforehand.
Integration of Theoretical Knowledge and Flight Instruction	There is no point trying to explain something in the air or in a short briefing if the student has not already studied that concept in greater detail. As such, it is important to make sure the theoretical knowledge and the air instruction are synchronised. Find out if the student has done the required reading before the flight lesson. If not, it may be appropriate to cancel the flight and do ground school. This will ensure that next time he is better prepared. It is important that the theoretical and practical sides of the training run roughly concurrently – If the student has already read a certain chapter of the book, it makes the lesson much more relevant.
3a. Instructor Standards	
Appearance & Conduct	The instructor at all times must appear smart, well groomed and professional. A sloppy or dishevelled appearance is indicative of poor personal standards and attitude towards the job.
Personal Habits	Personal habits, such as scratching, picking, mumbling etc detract from the student's experience and should be minimised where possible as they are distracting.
Food & Cleanliness	An instructor should avoid eating smelly or gas-producing foods, such as garlic or beans, in the hours before instructing. Remember you will be sharing a very small space together!
Personal Standards	The instructor should strive for the highest standard of tuition and aircraft operation throughout. He should keep himself up to date with the latest rules and regulations, as well as aircraft and flying school procedures.
Professional Standards	All instructors at a school should be standardised – ie they should all teach in the same way. This allows them to share students easily. The method your ATO uses to teach each lesson will be in the relevant ATO manual. Most ATOs maintain standardisation by regular standards meetings where such matters are routinely discussed.

4a. Techniques of Applied Instruction - Theoretical Knowledge – Classroom instruction Techniques:	
Use of Training Aids	There are a great many training aids that should be used to assist in instruction: Whiteboard, OHP, PowerPoint, Aircraft models, cockpit window cut-outs, real aircraft instruments, charts, computers etc. The importance of these visual aids cannot be overstated, and no pre-flight briefing should be given without the aircraft model being close at hand. Audio-visual presentations, such as short videos or photographs can make a theoretical knowledge lesson come alive. The CAA still value the ability of an instructor to deliver a briefing on a whiteboard.
Group Lectures	If there are several students at around the same stage in training, a group lecture can be a good way to reduce time for the instructor, but more importantly, the interaction between several students can generate positive learning benefits.
Individual Briefings	Sometimes, a one-on-one briefing can be more valuable, especially if the student has a special need or is struggling/racing ahead.
Student Participation/Discussion	As with Group Lectures, above, student participation and discussion can be a very useful tool in learning. Observing students discussing a topic can tell the instructor the level of understanding that has been gained.
4b. Techniques of Applied Instruction - In-Flight – Airborne Instruction Techniques:	
The Flight/Cockpit Environment	The cockpit environment in flight is alien to most students, and has a number of limitations when it comes to teaching and learning. The student will be under a workload – possibly overloaded, or may be anxious. The side by side seating and lack of eye contact poses challenges, which need to be overcome. The lack of a 'pause button' means that the instructor cannot go into in-depth explanations during flight. This is best dealt with by making a note on the kneeboard for later discussion. But do not forget to return to the subject after the flight.
Techniques of Applied Instruction	Nothing in the airborne lesson should be new to the student. Everything should have been discussed on the ground in either the long briefing or the short briefing. Any airborne debriefing should always involve the instructor taking control first, to allow the student to concentrate fully. Some students feel that the instructor taking control is an admission of failure on their part. A good way to do this is to say 'I have control, just so I can explain this to you'.
4c. Techniques of Applied Instruction - Post-Flight:	
Debrief	The importance of a good debrief cannot be overstated. An effective debrief cannot be conducted in the air, and it is vital that a debrief is carried out after flight to ensure the relevant messages are driven home. The debrief need not take very long, but it is a critical, and all too often forgotten part of the lesson. The debrief should include any notes you made during the flight for discussion later. Make sure the student takes notes during a debrief or the chances are, the information will be lost.
4d. Techniques of Applied Instruction - In-Flight Judgment and Decision Making	
Judgment and Decision Making	It is more or less impossible to teach judgement and decision making effectively in the classroom. The best way is to teach by example. Whenever opportunities arise during the flight (weather or technical situations), try to involve the student and allow them to see how decisions are made and solutions are found. This sets the seed for the teaching of CRM.

5a. Student Evaluating & Testing - Assessment of Student Performance:	
The Function of Progress Tests	Progress Tests are important to allow both the student and instructor to gauge the student's performance. As a fundamental tenet of instruction is 'to take the student from where he is to where he needs to be', we need to know where the student is in order to be able to do this effectively. Progress tests can be written or practical.
Recall of Knowledge	The regular asking of questions during ground and flight instruction can give a good idea of the student's factual knowledge. **The Law of Exercise.** This law states that things most often repeated are best remembered. Frequently asking your student to give the answer to an important question will help him to remember it when needed. For example, every time he lines up for take-off, ask him the demonstrated crosswind. Every time he starts the engine, ask the starter duty cycle.
Translation of Knowledge into Understanding	More probing questions will be needed to make sure the student's knowledge of facts has been fully understood. Many students are good at remembering facts, but they need to be understood. For example – the student knows the crosswind limit is 13 kts. But, when the tower gives the wind for take-off, fails to understand whether or not this limit has been exceeded.
Development of Understanding into Actions	The most advanced form of learning allows the previously learned facts and their understanding to be translated into actions. For example after a simulated cabin fire in flight, the student has learned that turning off the Battery Master Switch is an item on the checklist. He is able to recall and understand this fact. However, this fact in itself is only the beginning. Once he has translated this knowledge into understanding, he should be able to realise that he has now lost the use of the radio transponder, and any electrically operated flaps. The final stage is developing this understanding into actions – the student then tells you he will have to join the airfield non-radio and perform a flapless landing.
The Need to Evaluate Rate of Progress	Every student learns at their own rate, and this rate needs to be understood by both parties. Sometimes the rate may be so slow that a serious conversation is needed. Sometimes, an enthusiastic student wants to race ahead. This also needs to be managed.
5b. Student Evaluating & Testing - Analysis of Student Errors:	
Establish the Reason for Errors	Students rarely make errors deliberately. There is always a reason why errors are made – it may be poor instructional technique or a failure to grasp a concept. The key to improving performance is identifying the reasons why an error is made. For example, on the ILS, the student always goes high on the glide slope at the FAF. The reason turned out to be that he always selected flap at the FAF. Knowing the reason can help prevent its recurrence by forewarning.
Tackle Major Faults First, Minor Faults Second	It is unrealistic to try to solve all the problems in a flight by a single debrief. It is important to prioritise the major faults first and fix them before tackling the smaller ones.
Avoidance of Over-Criticism	If too much criticism is levelled at the student, he may become despondent and this may result in demotivation. As above, tackle the major problems first (or in isolation).
The Need for Clear Concise Communication	As in all elements of flight instruction, communication is the key. The student must always understand what is required of him, and how his performance fared.

6. Training Programme Development	
Lesson Planning	Good lessons are not made up as the instructor goes along. They have well defined aims, well thought out content, with various visual aids, and a summary at the end.
Preparation	Spend time preparing the material, including any handouts or visual aids. Not only does it make your teaching job easier, but the student feels that a more professional job is being done.
Explanation & Demonstration	Be ready to explain concepts in more than one way if a student struggles to grasp it the first time – just because you understand that explanation, doesn't mean your student will.
Student Participation & Practice	Asking of questions and practical exercises will allow you to ascertain if the student understands. Less outgoing students may just nod rather than admit they don't understand something.
Evaluation	Make sure you (and your student) are happy with the student's progress before moving on to the next subject.

7. Human Performance and Limitations Relevant to Flight Instruction	
Physiological Factors	A student who is tired, hung-over or airsick will not be in a good place to learn. Get the student used to assessing his own condition before deciding to fly.
Human Information Processing	Make sure the student does not become overloaded during lessons. Often, the instructor will want to move on to the next part before the student has fully assimilated the previous section. This is counter-productive.
Behavioural Attitudes	Monitor student attitude and behaviour to see if any negative trends are developing. If they are, address them early on so that there is time to change.
Development of Judgment & Decision Making	While training your student, if decisions have to be made, involve the student – that is how he will learn to make decisions himself. Explain to him why you made the decisions you did. This is how CRM is best taught.

8. Hazards Involved in Simulating Systems Failures and Malfunctions in the Aeroplane During Flight	
Selection of a Safe Altitude	Have minimum altitudes for hazardous activities such as stalling, spinning, engine shutdowns, EFATO etc. They may be set by the training establishment, or you may need to set your own. Never be tempted to go below them as this sends the wrong message to the student.
Importance of 'touch drills'	Make it clear to the student whether the failure and subsequent drills will be real or touch drills only. Certain items can still be moved during touch drills – throttle, fuel pump etc.
Situational Awareness	Introduce the term 'Situational Awareness' and stress that it applies to Geographical environment as well as checklist status and aircraft operational state. Consider such tools as 'Plane-Path-People' to help develop awareness.
Adherence to Correct Procedures	Always use the correct procedures, and do not hesitate to refer to the appropriate checklist in flight. This sends the message to the student that it is ok to do this himself.

9. Training Administration		
General:	**Flight/Theoretical Knowledge Instruction Records:** The importance of the instructor making such student records as soon as possible after the event. **Log books:** The need to keep both instructor and student log books up to date. **Flight/Ground Curriculum:** The instructor should know the curriculum and know where to find the details. **Study Material:** The importance of knowing what material is available for instruction and study. **Official Forms:** The instructor should have a good knowledge of the required CAA and ATO/DTO forms. **AFM/PoH:** The instructor should be familiar with these publications and encourage the student to study them. **Flight Authorisation:** The instructor and the student should both be familiar with flight authorisation procedures. The student should be encouraged to take responsibility for this. **Aircraft Documents:** The instructor should be familiar with these documents and encourage the student to study them. **Licence & Rating Requirements:** Both instructor and student should understand the privileges and limitations of their licencing documents.	
The CRI(A)'s Responsibilities:	**Training Standards:** A high level of personal standards should be maintained by the instructor. **Standardisation:** A high level of commonality with other instructors should be maintained. **Preparation for Skill Tests/Proficiency Checks:** Although not primarily there to teach the student to pass the test, the instructor should be fully aware of the requirements of the relevant test the student is being prepared for. **Training Effectiveness:** The instructor must consider how effective his instruction is, and if necessary, seek to address this. **Examination & Fault Analysis:** The instructor must be effective at analyzing student faults before he can correct them. **Development of Student Responsibilities**: The instructor must strive to encourage the student to take responsibility from an early stage of training – PPR, walkarounds etc. Not only does this reduce workload on the instructor, but it makes the student feel empowered. **Instructor Continuity Training:** The instructor role is continually changing and both theoretical and flying skills need to be kept up to date.	
FCL CRI(A):	**Introduction** **General Information** **Privileges of the CRI** **Experience Requirements** **Skill Tests & Proficiency Checks** **Revalidation/Renewal of Ratings**	The instructor must have a good working knowledge of all of these pieces of legislation, and keep up to date with them as they change.

Appendix 5: Flight Training

3: Simulated Emergencies:

During instructor training as well as all other forms of flight training, there is a need to simulate emergencies. It is important that these 'simulated' emergencies are managed carefully so that they do not in themselves become real emergencies.

Types of Emergency:

There are two basic types of simulated emergency:

- **Life-threatening emergencies** such as engine fire, engine failure, pilot incapacitation.
- **Non-Life-threatening emergencies** such as radio failure, electrical failure, getting lost.

Simulated Engine Failures:

There are 2 ways the instructor can simulate an engine failure:

- **Closing the throttle** – ideal for an engine failure after take-off (EFATO), but not the best way in cruise flight.
- **Building a Scenario –** Far better and more realistic for engine problems in the cruise. A problem can be built up in a more realistic way by the instructor pointing out things that are not normal. For example, starting with a high oil temperature, then a strange vibration, then possibly some smoke or fumes from the engine. This may encourage the student to run the engine at lower power and carry out some diagnosis (which may fix the problem) before rushing in to the full engine failure drills. There is no time for this method during an EFATO.

During the course of the ensuing practice engine failure in single-engined aircraft, the instructor is effectively also acting as a safety pilot. In a real engine failure, the student would not be expected to 'warm the engine' periodically. If they choose to do so then that is ok, otherwise the instructor must do so since he has a 'duty of care' to the aeroplane. This is no negative reflection on the student. In a similar manner, the instructor is responsible for making sure the carb heat is on, low flying rule adherence and calling the go-around.

Simulated engine failures of single-engined aircraft may also be practiced in the circuit, but be careful not to inconvenience other airfield users.

Touch Drills:

The student should know what touch drills are – just touching the control and saying what you would do with that control works well. It is important that the student not only touches the correct control, but also says the correct thing. For example, a student, in the feather drill in a multi-engined aeroplane may touch the left propeller control and say 'feather right'. Obviously, this is not acceptable. Neither is just touching it, or touching it and saying left. He needs to unequivocally touch the left prop control and say 'feather left'.

Some controls in some drills can actually be moved by the student: Throttle, fuel pump, carb heat, flaps etc. This should be encouraged. Imagine in an engine fire scenario if the throttle wasn't retarded.

Circuit Breakers

The instructor should not deliberately and secretly pull circuit breakers (CBs) in order to simulate a failure. It may be that that service cannot be restored.

Simulated Fires:
Many skill tests require a simulated fire to be dealt with. This can also be built up using a scenario. The instructor could start coughing, then point out a faint smokiness in the cabin. Then, slowly report worsening symptoms until the student responds by actioning the appropriate checklist.

Simulated Distress Calls:
Instructors should be encouraged to train students to make Practice PAN calls and training fixes during their training. Remember, a practice PAN can be made on any frequency, including a tower or AFIS frequency.

Intervention

It is very important to know when and how to intervene during flight training. Several accidents have occurred as a result of the instructor failing to intervene in a timely manner.

If the instructor intervenes too soon, the student misses a valuable learning point, and begins to rely on the instructor to get him out of trouble. If the instructor leaves it too late, then there is a possible safety problem.

There is also the question of how the intervention is done. There are 4 main levels of intervention, that can be summarised as shown:

1: Hint & Tip

If time is not too critical, a timely hint or tip can achieve the desired result. For example, when a student is low on the approach, a comment such as 'How do you think the vertical profile is looking?' might be enough for them to have a think about the situation. Similarly, on base leg, with a strong tailwind that has gone unnoticed: 'What do you think the wind is up here?'

2: Tell me what's wrong

If hinting and tipping haven't worked, a more direct approach may be needed. For the student low on approach: 'We're a bit low'. This still gives the student a chance to consider the problem and work out how to resolve it.

3: Tell me how to fix it

If pointing out the problem doesn't work, it may be that the student cannot think how to resolve the problem. They may need you to say something like 'add more power now' or 'raise the nose now'.

4: Fix it for me.

The last level occurs when all other avenues have been exhausted. You will need to say 'I have control' and fix the problem.

Appendix 6a: Trainee Needs

It is important when training a student that their needs are covered. Not every student is the same and they each have differing needs. These needs can be summarised as follows:

- **Start from where I am.**
- **Let me know where I am going.**
- **Give me a reason to want to get there.**
- **Let me know how I am doing.**
- **Use *MY* experience.**
- **Progress at *MY* pace.**
- **Let me make the knowledge and skill my own.**
- **I acknowledge responsibility for my own learning.**

Appendix 6b: Instructor Competencies

According to CAA Standards Document 10: **All instructors shall be trained to achieve the following competences:**

These will de dealt with in turn:

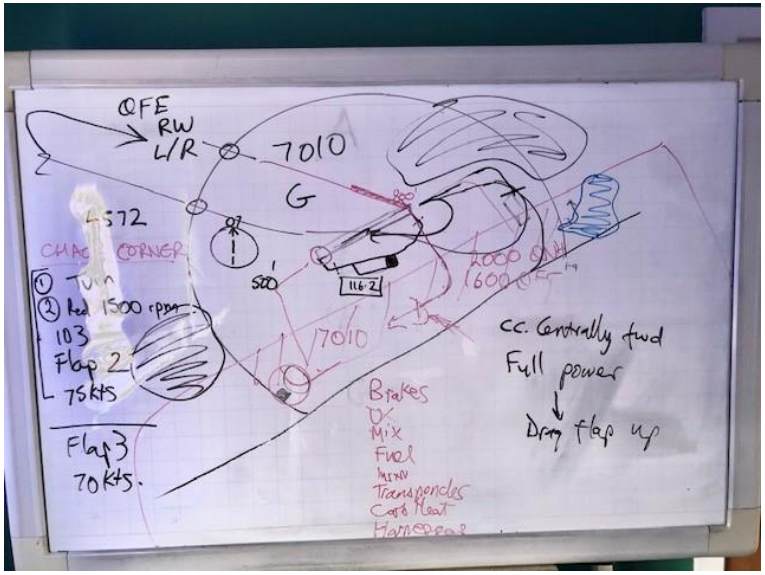
Prepare Resources

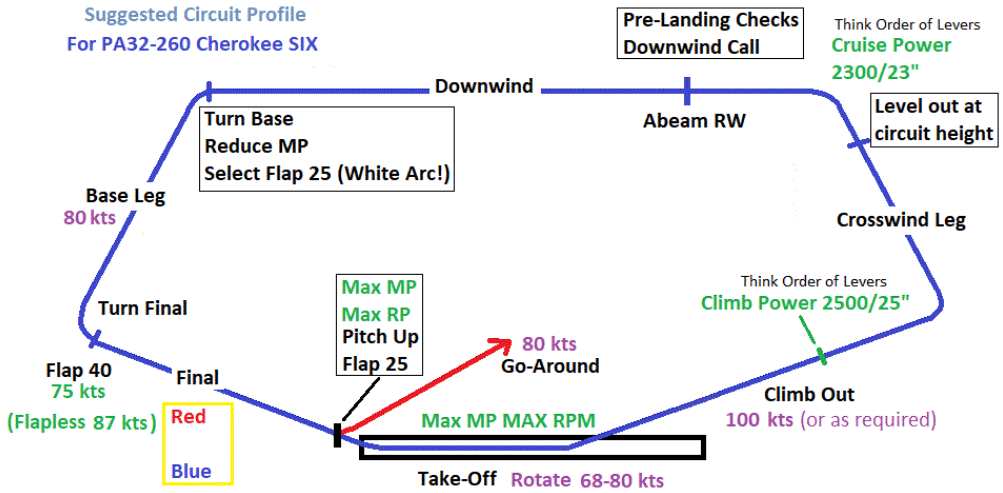
A lesson, be it ground or in the air requires considerable preparation on the part of the instructor. It will require:

- **A Framework:** The lesson should be structured in order to keep it concise and on track. This will usually begin with an aim, and then continue into the body of the lesson. At the end there should be a summary and time for questions.
- **Teaching Aids:** On the ground, these might include an airc4aft model, a white board and pens, aircraft instruments, video clips etc. There use should be integrated into the lesson. In the air, such items as IMC goggles, instrument covers, maps etc should all be ave to the instructed as and when needed. It does not inspire the student with confidence if the instructor cannot find or has forgotten to bring these items along.

- **Course Books:** It may be appropriate for the student to have been recommended or given a book, or other prepared documents (such as checklists or flight profiles) to guide them through a coure or lesson.

It is important to make sure any resiurces you use are effective. Consider the following example.





Which of these 2 teaching aids would you use?!

Create a Climate Conducive to Learning

The learning environment is very important. This has several aspects:

- **Instructor Manner:** The instructor must be patient, approachable and unhurried in his behaviour. Many instructors allow insufficient time for lessons or briefings, and the result comes across negatively to the student who feels they are under pressure to learn and understand quickly. The general nature of the instructor here is also importance – appearance, professionalism and sense of humour are important.
- **Physical Climate:** The place where teaching is to take place (classroom, aeroplane or simulator) must be suitable in terms of temperature, light and other facilities needed. Briefing or teaching should never take place at a table in a crowded café.

Present Knowledge

It sounds obvious, but learning is much about the transfer of knowledge (and skill) from instructor to student. It is important that this transfer happens.

Integrate TEM & CRM

- **TEM:** It is a CAA requirement now to integrate Threat and Error Management into all aspects of aviation instruction. This begins in the classroom, and pre-flight briefings should already contain this element. One way to introduce this is to colour code as follows:

  Aim: To learn how to safely perform one engine inoperative turns, descents & climbs.
  Threats: Other aircraft, Terrain, Engine overheat.
  Errors: Loss of control, Infringement, fuel mismanagement
  Management: Lookout, Speed & bank angle awareness, Checklist discipline, Pre-flight planning, Altimeter checks.

  In this way, once the aim of the lesson has been established, there can follow a discussion about what the possible threats and errors are associated with that exercise. This then allows another discussion on how to manage those threats. It is not sufficient to just list the threats and then not continue to the management phase. Later in the flight, these threats, errors and management techniques should be pointed out as they occur to underline their importance.
- **CRM:** Crew Resource Management should be encouraged at all times, but it is particularly important in the aeroplane. The use of interactive briefings, verbalization and open questions will help guide the student in this matter. CRM is something that is best led by example. As an instructor, always try to display high levels of CRM at all times. Explain why you make the decision you did.

Manage time to achieve Training Objectives

During the lesson, there is usually only a limited time available. This may be due to aircraft or instructor availability, airport operating hours etc. It is important that the time available is used to best manage the training requirements. If a student needs more practice, it may become necessary to drop a later exercise in order to properly practice the troublesome section.

Facilitate Learning

Not all students learn in the same way. Some grasp ideas quickly, others need more time. Some students are very 'visual' and rapidly understand concepts when diagrams are used. Sime like mathematical formulae – others don't! It is your job as an instructor to find a way to make that student learn as best he can.

Assess Trainee Performance

Obviously, the student's performance must be continually assessed in order to ensure that progress is being made. This assessment is important to the student, the instructor and the training establishment. This is done partly in the post flight debrief, but should also be recorded in student records. Traditionally, such records were handwritten, but increasingly, ATOs are using on-line training records. Such records should also be available to the student.

Report writing is an integral part of any instructor's daily activity. It is a skill that may require development. This section offers suggestions for use by instructors as guidance material to produce accurate reports.
All reports must reflect the debrief. Instructors should avoid writing comments that have not been discussed during the debrief.

An accurately written report can serve the following purposes:

- As a written hand-over to the next instructor
- To provide the trainee with an overview of how the training is progressing
- To provide the trainee with tips for improvement
- To allow the HoT to analyse progress or areas for development
- To allow the HoT to deal with poor performance in a structured and fair manner

Use CAP (Commentary, Appraisal, Pointers):

Commentary

Detail how much of the lesson has been completed and to what overall standard has been achieved. Phrases to describe the standard might include; "to standard, below standard, good standard, very good standard and excellent standard".

Appraisal

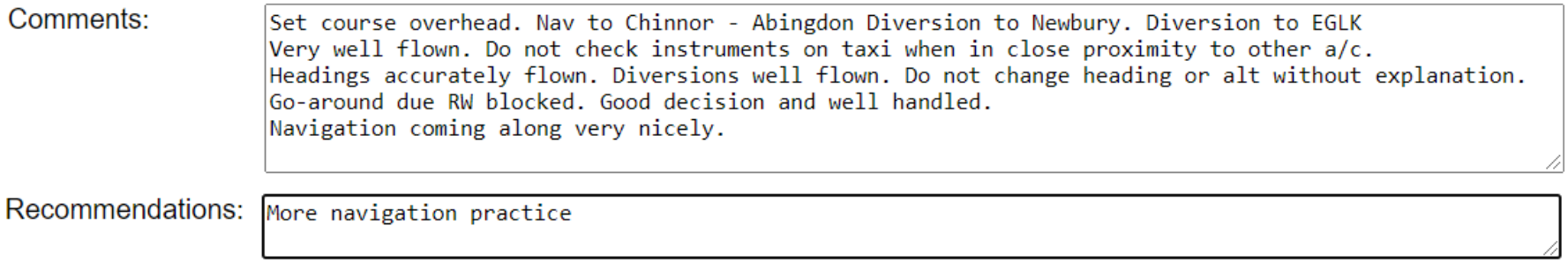
Write a phrase or phrases to discuss where the student is in more detail. For example; "X continues to overbank in turns, 30 degrees AoB as a maximum! S&L flight is improving now that X trims effectively. Checklist usage needs further study though.

Pointers

List a couple of Main Points and a couple of Minor Points for improvement going forward. The Main Points would have formed the main part of the debrief. The exact number of Pointers is unimportant but would probably be between 1 and 4. Pointers can of course be positive! Ensure that remedies are offered where possible.

Signing Off the Report

Instructors should remember that student confidence is vital. Positive reinforcement is more powerful and aim to leave them with a word of encouragement. For example: “X is a pleasure to teach, keep up the hard work”



Giving positive feedback is a task most instructors enjoy. However, it is equally important to deliver negative feedback too. Negative feedback can be hard to handle and, when poorly delivered, unhelpful. We have all been on the receiving end of criticism - it is neither easy to give nor take. And yet, if appropriate, timely, and well wrapped, feedback can be a positive experience. While negative feedback might suggest a focus on the worst, it creates an immense opportunity for improvement when viewed in the right light. After all, an insightful critique provides a chance to grow and excel.

There are several points to think about before giving a student feedback:

- Harsh feedback may be counterproductive. Deliver feedback carefully and respectfully. If given too frequently and without regard to feeling, the student may revert to defense mode – possibly losing confidence, self-esteem, and motivation.
- Feedback isn’t always negative. Don’t persistently focus on what isn’t working or isn’t being done right. Attending to what is going well can support a student’s growth and steer their development in the right direction.
- Feedback isn’t always positive. On the other hand, don’t always focus on strengths. If you only address the positives, the student will return to what they were doing, believing they have nothing to improve. Nevertheless, they will be delighted as they appear to be doing almost everything right. The balance between the points above is essential.
- Providing a fix may not be the answer. Ask facilitative questions that encourage reflection. Such open support can lead the student to understand what they did well, or poorly.
- Avoid wrapping negative feedback in praise. The feedback sandwich (there are more colloquial names for it), while popular, may not always be appropriate. The standard compliment/critique/compliment can give a false view of how someone is performing. Two positives outweigh one negative and, therefore, might suggest successful performance.
- Constructive criticism. Identifying the problem, then coming up with a plan to fix it is a powerful development tool. Help the student find ways to avoid making the same mistake while learning a new skill.
- Be honest and sincere. Students are often aware of their underperformance, so the feedback should not be a surprise. Make it clear you are keen to help them improve, rather than find fault.

- Be direct and clear. At the end of the feedback, don't let the student walk out of the room thinking 'what just happened?' State the feedback clearly and directly, without being rude or uncaring.
- Be specific. Don't overgeneralize or drift into other issues. Focus on the point(s) of feedback.
- Don't become personal. Do not confuse the person with their actions. Being personal may lead the student to shut down. They will be less likely to act on, or learn from, the points shared.
- Be consistent. Depending on the feedback frequency, the student shouldn't be surprised by what you have to say. Regular interaction can help avoid lengthy, negative, and unexpected feedback.
- Keep feedback fresh. Avoid a long gap between the lesson and providing feedback. The discussion should be current so that no one is trying to remember what happened.
- Always provide feedback in private, rather than in a public area.
- Always make a note of the feedback given so that any trends can be identified early.

Monitor and Review Progress

In much the same way as assessing trainee performance (above), the instructor should conduct a longer-term review of the student's progress to check for any undesirable trends. These should be communicated to the student as soon as possible.

Evaluate Training Sessions

It is important to find out if the training has been successful as soon as possible afterwards, or even during the training. Ask questions to find out if the lesson objectives and aims have been met.

Report Outcome

Make it clear to the student whether or not they have met the aims and objectives of the lesson using the same techniques as for feedback.

Appendix 7: CAA Forms & Documents (Click to visit)

Example forms are shown on the following pages, with guidance notes. Visit links for latest versions

SRG 5018: Course Completion Certificate for an Instructor Course
SRG 2159: On-line Form for Application, the issue, renewal, revalidation or variation of an instructor certificate.
SRG 1169: Examiner's Record - FI(R)/FI/CRI/IRI/FIC Authorisation Test/Check

Other Useful Documents

CAA Standards Document 10: Assessment of Competence for Instructor Certification
CAP 804: Flight Crew Licensing - For Guidance Only

Full List of CAA Forms (Click to visit)

SRG 5018: Course Completion Certificate for an Instructor Course

CAA5018 Instructor Training Course Completion Certificate in Accordance with Part-FCL

This form is intended for use in the provision of evidence in support of an application made to the CAA using the CAA's online application service. Once completed the form should be scanned or photographed and uploaded by the applicant as part of an online application to the CAA.

FALSE REPRESENTATION STATEMENT
It is an offence under the UK Air Navigation Order to make, with intent to deceive, any false representation for the purpose of procuring the grant, issue, renewal or variation of any certificate, licence, approval, permission, or other document. This offence is punishable on summary conviction by a fine and on conviction on indictment with an unlimited fine or imprisonment or both.

GUIDANCE NOTES

GUIDANCE NOTE 1: Authorised signatories

An authorised signatory acts as a representative of the Head of Training, authorised by the Head of Training or through approved procedures to confirm that the stated training has been conducted by the Approved Training Organisation (ATO). The ATO must maintain a record of those so authorized.

GUIDANCE NOTE 2: Which sections of the course completion to complete

You are only required to complete and print the sections relevant to your application.

Application applied for	Sections to be fully completed
FI initial issue	1, 2, 3, 5
FI/CRI/IRI variation	FI - 1, 6(i) or 6(ii) / CRI - 1, 6(vi) / IRI - 1, 6 (vii)
FI/CRI/IRI renewal or revalidation	1, 5(v), 5(vi)
CRI/IRI/FTI initial issue	1, 2, 5(i), 5(ii), 5(iii), 5(iv)
MCCI initial issue or renewal	1, 4, 7
MCCI revalidation	1, 7
MCCI variation	1, 6(v), 7
FTI revalidation	1, 5(v)
FTI renewal	1, 5(v)
Mountain rating instructor initial issue	1, 2, 3, 5
TRI / SFI / STI initial issue	1, 2, 5
TRI / SFI renewal	1, 2, 5
TRI / SFI revalidation	1, 5
TRI / SFI variation	1, 2, 6
STI renewal	1, 5

1. APPLICANT DETAILS — To be completed by the Training Provider

CAA Personal Reference number (if known): ..... Date of Birth: .....

Title: ..... Forename(s): ..... Surname: .....

This application is for (please select all that apply): Initial issue ☐ Renewal ☐ Revalidation ☐ Variation ☐

2. PRE-REQUISITES — To be completed by the Training Provider

I certify that (name) ..... has met the pre-requisites for (certificate(s)) .....

I further certify that I have examined the Pilot's logbook and confirm they have met the pre-requisite hours requirements: Yes ☐ No ☐ N/A ☐

The following hours have been flown and verified in the pilot's logbook (please provide a summary of total hours as per the requirements in the regulation):

Training Provider Details:

Name of Approved Training Organisation (ATO) (if applicable): ..... ATO number (if applicable): .....

Competent Authority issuing approval (if applicable) : .....

Name of Head of Training (or authorised signatory): .....

Signature of Head of Training or authorised signatory: ..... Date: .....

3. Flight or Mountain Rating Instructor (FI/MI) Pre-Entry Flight Test — To be completed by the Instructor

I confirm the pilot has satisfactorily completed a pre-entry flight test on (date): .....

I recommended the pilot for the specified course (select one): Flight Instructor (FI) ☐ Mountain Rating Instructor (MI) ☐

Name of FI/MI who conducted the flight test: .....

Instructor reference number: ..... Competent authority issuing certificate: .....

Signature of Instructor: ..... Date .....

4. MCCI Course Instructor (if applicable) — To be completed by the Training Provider

I can confirm that I have reviewed the pre-entry requirements alongside the applicant's experience and can confirm that the applicant meets Part-FCL.915.MCCI pre-entry requirements and FCL.930.MCCI a1) + a2) and/or FCL.940.MCCI (where appropriate) and therefore propose that the applicant proceed to formal observation by CAA or a nominated deputy.

Training Provider Details:

Name of Approved Training Organisation (ATO) (if applicable): ..... ATO number (if applicable) : .....

Competent Authority issuing approval (if applicable) : .....

Name of Head of Training (or authorised signatory): .....

Signature of Head of Training or authorised signatory: ..... Date .....

5. TRAINING COURSE DETAILS — To be completed by the Training Provider

5)i) Theoretical knowledge — To be completed by the Training Provider

..... hours of theoretical knowledge (TK) instruction

The applicant has satisfactorily completed: *(select one)*: Full TK training ☐ Reduced TK training ☐ Not applicable ☐

The applicant has completed reduced course of TK training on the basis of: (if applicable)

5)ii) Teaching and learning — To be completed by the Training Provider

..... hours of teaching and learning completed

The applicant has satisfactorily completed: *(select one)* Full teaching and learning ☐ Reduced teaching and learning ☐ Not applicable (exempt) ☐

The applicant has completed a reduced course of teaching and learning in accordance with FCL.915(c)(1) on the basis of: (if applicable)

5)iii) Technical training (IRI, CRI initial issue) — To be completed by the Training Provider

The applicant has satisfactorily completed ..... hours of technical theoretical training

5)iv) Flight training — To be completed by the Training Provider

I confirm the pilot has satisfactorily completed an approved course of training in accordance with Part-FCL for the following:

i) FI(A) ☐ FI(H) ☐ FI(AS) ☐ FCL.900C FI(A) ☐ FCL.900C FI(H) ☐

ii) Class Rating Instructor CRI SE ☐ ME ☐

iii) Instrument Rating Instructor IRI(A) ☐ IRI(H) ☐ IRI (AS) ☐

iv) Flight Test Instructor ☐

v) Mountain Rating Instructor (FCL.930.MI(a)) ☐

vi) Type Rating Instructor TRI(A) (Please specify type): .....

vii) Type Rating Instructor TRI(H) (Please specify type): .....

viii) Type Rating Instructor TRI(PL) (Please specify type): .....

ix) Type Rating Instructor issued in accordance with FCL.725(e) (Please specify type) .....

x) Synthetic Flight Instructor SFI (Please specify type): .....

xi) Synthetic Flight Instructor SFI (SPA) ☐ (MPA) ☐ (H) ☐ (PL) ☐

xii) Synthetic Training Instructor STI A ☐ H ☐

Course start date: ..... Course end date: .....

The applicant has satisfactorily completed: (select one) Full flight training ☐ Reduced flight training ☐ Not applicable ☐

The applicant has completed a reduced course of flight training on the basis of: (if applicable)

The course consisted of ..... hours of flight instruction of which ..... hours instrument ground time in a FTD 2/3 or FNPT I or FNPT II/III or FFS.

FSTD identification number of simulator used (which must be issued in accordance with UK Regulation No. 1778/2011) .....

Competent Authority issuing qualification certificate for the simulator: .....

Training Provider Details:

Name of Approved Training Organisation (ATO) (if applicable): ..... ATO number (if applicable) : .....

Competent Authority issuing approval (if applicable) : .....

Name of Head of Training (or authorised signatory): .....

Signature of Head of Training or authorised signatory: ..... Date .....

5)v) Instructor refresher training course — **To be completed by the Training Provider**

I confirm the pilot has satisfactorily completed the instructor refresher training course on ..... (date).

For the revalidation ☐ or renewal ☐ of an instructor Certificate in accordance with Part-FCL

Training Provider Details

Name of Approved Training Organisation (ATO): (if applicable) ..... ATO number (if applicable): .....

Competent Authority issuing approval (if applicable) : .....

Name of Head of Training (or authorised signatory): .....

Signature (Head of Training): ..... Date: .....

5)vi) Instructor revalidation/renewal information — **To be completed by the Examiner**

I can confirm that the pilot has met the requirements of Part-FCL for the revalidation/renewal of the following Instructor:

FI(A) ☐ FI(H) ☐ FI(As) ☐ CRI ☐ IRI ☐ SFI ☐ STI ☐ TRI ☐ MCCI ☐ MI ☐

The Certificate of Revalidation has been signed and the rating/certificate is valid until (date) .....

Examiner's Name: ..... Examiner's Number: .....

Competent Authority issuing Examiner's Certificate: .....

Signature (Examiner): ..... Date: .....

6. Training Course/Information Details — **To be completed by the Training Provider**

6)i) Flight instructor variation (course)

I certify that the pilot has satisfactorily met the variation hours requirement(s) in accordance with Part-FCL for the following:

Extend privileges to flight instructor certificate to include:

FCL.905.FI(h) IR ☐ FCL.905.FI(h) IR(R) ☐ FCL.905.FI(i) SPA ME ☐

Please note section 5 iv) must be completed with the relevant course information

Training Provider Details:

Name of Approved Training Organisation (ATO) (if applicable): ..... ATO number (if applicable): .....

Competent Authority issuing approval (if applicable) : .....

Name of Head of Training (or authorised signatory): .....

Signature of Head of Training or authorised signatory: ..... Date .....

6)ii) Flight instructor variation (other) — **To be completed by the Instructor**

I certify that the pilot has satisfactorily met the variation requirement(s) in accordance with Part-FCL for the following:

Extend privileges to flight instructor certificate to include:

FCL.905.FI(c) Flying multi-pilot operations on a single pilot aircraft ☐ FCL.905.FI(e) CPL ☐ FCL.905.FI(j) FI, IRI, CRI, STI or MI ☐

Signature of Instructor: ..... Date .....

I certify that the pilot has satisfactorily met the variation requirement(s) in accordance with Part-FCL for the following:

Extend privileges to flight instructor certificate to include:

FCL.905(k)(1) MPL ☐

I certify that the pilot has satisfactorily completed at least 500 hours of flight time as a pilot in aeroplanes, including at least 200 hours of flight instruction

Signature of Instructor: ..... Date .....

I certify that the pilot has satisfactorily met the variation requirement(s) in accordance with Part-FCL for the following:

Extend privileges to flight instructor certificate to include:

FCL.905(k)(2) MPL ☐

I certify the pilot holds a multi-engine aeroplane IR and the privilege to instruct for an IR ☐ And

I confirm the pilot has satisfactorily completed at least 1500 hours of flight time in multi-crew operations ☐ or

Is already an FI qualified to instruct on ATP(A) or CPL(A)/IR integrated courses and has completed a structured course consisting of the following training ☐ :

MCC qualification

Observation of five sessions of flight instruction in Phase 3 of an MPL course

Observation of five session of flight instruction in Phase 4 of an MPL course

Observation of five operator recurrent line-oriented flight training sessions

The content of the MCCI course

Signature of Instructor: ..... Date .....

I certify that the pilot has satisfactorily met the variation requirement(s) in accordance with Part-FCL for the following:

FCL.905.FI(f) Night ☐ FCL.905.FI(g) Banner Towing ☐ FCL.905.FI(g) Glider Towing ☐ FCL.905.FI(g) Aerobatic ☐

Date of demonstration flight: .....

Name of Instructor: ..... Instructor Reference Number: .....

Competent Authority issuing Instructor's Certificate: .....

Signature of Instructor ..... Date .....

6)iii) TRI variation — **To be completed by the Training Provider**

I certify that the pilot has satisfactorily met the variation requirement(s) to extend privileges of TRI in accordance with Part-FCL for the following:

FCL.905.TRI(2) ☐ FCL.905.TRI(3) (SPH PA) SP to MP ☐

FCL.910.TRI(b)/(c) (please specify type): .....

FCL.910.TRI(a) FSTD ☐ FCL.910.TRI(a) Line Flying (LIFUS) ☐ FCL.910.TR (b) Aircraft ☐

FCL.910(c)(2) TRI SPH to MPH ☐ FCL.910.TRI(a) Aircraft Takeoffs and Landings only ☐

Training Provider Details:

Name of Approved Training Organisation (ATO) (if applicable): ..... ATO number (if applicable): .....

Competent Authority issuing approval (if applicable) : .....

Name of Head of Training (or authorised signatory): .....

Signature of Head of Training or authorised signatory: ..... Date .....

6)iv) SFI variation — **To be completed by the Training Provider**

I certify that the pilot has satisfactorily met the variation requirement(s) to extend privileges of SFI in accordance with Part-FCL for the following:

FCL.905.SFI(b) (SPHPA) SP to MP ☐

FCL.910.SFI (please specify type): .....

Training Provider Details:

Name of Approved Training Organisation (ATO) (if applicable): ..... ATO number (if applicable): .....

Competent Authority issuing approval (if applicable) : .....

Name of Head of Training (or authorised signatory): .....

Signature of Head of Training or authorised signatory: ..... Date .....

6)v) MCCI variation — **To be completed by the Training Provider**

I certify that the pilot has satisfactorily met the variation requirement(s) to extend privileges of MCCI in accordance with Part-FCL for the following:

FCL.910.MCCI (please specify type): .....

Training Provider Details:

Name of Approved Training Organisation (ATO) (if applicable): ..... ATO number (if applicable): .....

Competent Authority issuing approval (if applicable) : .....

Name of Head of Training (or authorised signatory): .....

Signature of Head of Training or authorised signatory: ..... Date .....

6)vi) CRI variation — **To be completed by the Training Provider**

I certify that the pilot has satisfactorily met the variation requirement(s) to extend privileges of CRI in accordance with Part-FCL for the following:

FCL.905.CRI (Please specify class or type): .....

FCL.905.CRI(a) Banner Towing ☐ FCL.905.CRI(a) Glider Towing ☐ FCL.905.CRI(a) Aerobatic ☐

FCL.905.CRI(ba) Flying multi-pilot operations on a single pilot (please specify class or type): .....

Date of demonstration/assessment flight: .....

Name of Instructor/Examiner ..... Instructor/Examiner reference number .....

Signature of Instructor/Examiner ..... Date .....

6)vii) IRI variation	To be completed by the Training Provider

I certify that the pilot has satisfactorily met the variation requirement(s) to extend privileges of IRI in accordance with Part-FCL for the following:

FCL.905.IRI(b) (upgrade to MPL) ☐	FCL.915.IRI(a) (adding ME privileges in aeroplanes) ☐ **Note: Must also complete section 5(iv)**	FCL.915.IRI(b) (adding ME privileges in helicopters) ☐ **Note: Must also complete section 5(iv)**

Training Provider Details:

Name of Approved Training Organisation (ATO) (if applicable): ..... ATO number (if applicable): .....

Competent Authority issuing approval (if applicable): .....

Name of Head of Training (or authorised signatory): .....

Signature of Head of Training or authorised signatory: ..... Date.....

6)viii) Mountain Rating Instructor variation	To be completed by the Training Provider

I certify that the pilot has satisfactorily met the variation requirement(s) to extend privileges in accordance with Part-FCL for the following:

FCL.930.MI(a) Mountain Rating Instructor (wheels) ☐

FCL.930.MI(a) Mountain Rating Instructor (skis) ☐

FCL.930.MI(a) Mountain Rating Instructor (wheels and skis) ☐

Training Provider Details:

Name of Approved Training Organisation (ATO) (if applicable): ..... ATO number (if applicable): .....

Competent Authority issuing approval (if applicable) : .....

Name of Head of Training (or authorised signatory): .....

Signature of Head of Training or authorised signatory: ..... Date.....

7) Observation Report Form for Multi-Crew Co-Operation Instructor (A/H/PL)	To be completed by the Examiner

FSTD Qualification Number: ..... Aircraft Represented: .....

Date: ..... Start time: ..... Finish time:..... Duration: .....

	Assessment		Remarks
a)	Prepare Resources	☐	
b)	Create a climate conducive to learning	☐	
c)	Present knowledge	☐	
d)	Integrate threat and Error management (TEM) and crew resource management	☐	
e)	Manage time to achieve training objectives	☐	
f)	Facilitate learning	☐	
g)	Assess trainee performance	☐	
h)	Monitor and review progress	☐	
i)	Evaluate training sessions	☐	
j)	Report outcome	☐	

I confirm that the Applicant detailed in Section 1 above has conducted at least 3 hours of flight / MCC instruction under my supervision and to my satisfaction, in accordance with Part-FCL.920, Part-FCL.930.MCCI and / or Part-FCL.940.MCCI and should therefore be issued with the following authorisation.

Initial Authorisation ☐ Revalidation/Renewal ☐ Variation ☐

Multi-Crew Co-Operation Instructor (A) ☐

Multi-Crew Co-Operation Instructor (H) ☐

Multi-Crew Co-Operation Instructor (PL) ☐

Examiner Details

Name of Examiner: ..... Examiner reference number: .....

Competent Authority issuing Examiner's Certificate: .....

Signature of Examiner: ..... Date.....

SRG 1169: Examiner's Record - FI(R)/FI/CRI/IRI/FIC Authorisation Test/Check

This form is used by the examiner for recording of an AOC for an instructor. It is a useful guide to the instructor as it shows what will be tested during the AoC.

Sections 1-2: Self-explanatory.

Section 3: Filled out by the ATO. Must be signed by the head of training.

Sections 4 & 5: Self-explanatory.

Examiner's Record - FI(R)/FI/CRI/IRI/FIC Authorisation Test/Check Schedules - Aeroplane

Please complete this form online (preferred method) then print, sign and submit as instructed. Alternatively, print, then complete in BLOCK CAPITALS using black or dark blue ink.

Civil Aviation Authority

Unique No. (to be completed by CAA)

Please read attached Guidance Notes before completing this form.

FALSE REPRESENTATION STATEMENT

It is an offence under Article 256 of the Air Navigation Order 2016 to make, with intent to deceive, any false representation for the purpose of procuring the grant, issue, renewal or variation of any certificate, licence, approval, permission or other document. This offence is punishable on summary conviction by a fine up to £5000, and on conviction on indictment with an unlimited fine or up to two years imprisonment or both.

1. Applicant Details — **To be completed by the Applicant**

Surname..... Forename(s).....

CAA reference number: ☐☐☐☐☐☐☐

2. Test/Check Details — **To be completed by the Applicant**

Type of Test:..... Location:..... Date:.....

A/C or STD reg & type:..... Off blocks:..... On blocks:.....

A/C or STD reg & type:..... Off blocks:..... On blocks:.....

Type (including variants):.....

FSTD Identification Number of simulator used (which must be approved in accordance with Commission Regulation (EU) 1178/2011 as amended):.....

Competent Authority issuing Qualification Certificate for the simulator:.....

Date flying training complete:.....

SECTION 1: Theoretical Knowledge	Pass	Fail	Observations/Reasons for Failure
Long Briefing Title			
a. Air law			
b. Aircraft general knowledge			
c. Flight performance and planning			
d. Human performance and limitations			
e. Meteorology			
f. Navigation			
g. Operational procedures			
h. Principles of flight			
i. Training administration			

SECTION 2: Pre Flight Briefing	Pass	Fail	Observations/Reasons for Failure
a. Visual presentation and content			
b. Technical accuracy			
c. Clarity of explanation			
d. Clarity of speech			
e. Instructional technique including TEM/ CRM			
f. Use of model and aids			
g. Student participation			

4 copies required. Copies of the report shall be submitted to (1) The Applicant (2) The Applicant's Competent Authority (3) The Examiner (4) The Examiner's Competent Authority (if different)

SECTION 3: Flight	Pass	Fail	Observations/Reasons for Failure
a. Arrangement of demonstration			
b. Synchronising of speech/demo			
c. Assessment and correction of student faults			
d. Aeroplane handling			
e. Instructional technique			
f. General airmanship/safety			
g. Positioning and use of airspace			
h. Risk assessment including TEM/CRM			
Main Exercise Title and No.			
i			
j			

SECTION 4: Mandatory Exercises and other exercises at Examiner's discretion	Pass	Fail	Observations/Reasons for Failure
a. Spin avoidance (SE aeroplane)			
b. Safety module			
c. Take-off and climb, engine failure after take-off (SE aeroplane)			
d. Approach, landing, missed approach			
e. Forced landing without power (SE aeroplane)			
Additional exercises Title and No.			
f			
g			

SECTION 5: Multi engine (Aeroplane) - may be conducted in FNPT 2 or Simulator	Pass	Fail	Observations/Reasons for Failure
a. Engine failure (simulated) after take-off or on go-around			
b. Asymmetric approach and go-around			
c. Asymmetric approach and landing			

SECTION 6: Instrument Exercises - give exercise Title and No. in space provided	Pass	Fail	Observations/Reasons for Failure
a. Basic instrument flight			
b. Applied instrument flight			
c. Instrument approach			
d. Limited panel and unusual attitudes			

SECTION 7: Post Flight Debriefing	Pass	Fail	Observations/Reasons for Failure
a. Visual presentation and content			
b. Technical accuracy			
c. Clarity of explanation			
d. Clarity of Speech			
e. Instructional technique and facilitation			
f. Use of model and aids			
g. Student participation			

3. APPROVED TRAINING ORGANISATION

Approved Training Organisation (ATO): ..... ATO Approval No: .....

Competent Authority issuing approval: .....

Head of Training (block capitals): .....

Signature (Head of Training): ..... Date: .....

PLEASE REFER TO FALSE REPRESENTATION STATEMENT ON PAGE 1

4. RESULT

Tick appropriate box

Pass ☐ Fail ☐ Partial ☐

Retest Requirement: ..... Rating Revalidated Until (if applicable): .....

I have received information from the applicant regarding their experience and instruction and certify that this complies with the requirements of EASA Part-FCL.

I have assessed the ICAO English Language Proficiency of the Applicant at Level 6: Yes ☐ No* ☐ Not Assessed ☐

(*I have advised the Applicant to complete Form SRG 1199 and be assessed by an appropriate organisation, see CAP 804, Section 4, Part M.) Assessment is not required if Applicant holds Level 6.

Examiner's Name (block capitals): ..... Examiners Number: .....

Authorising Competent Authority: ..... Date of Examiners Briefing (if applicable): .....

Signature (Examiner): ..... Date: .....

PLEASE REFER TO FALSE REPRESENTATION STATEMENT ON PAGE 1

5. TEST, CHECKS AND ASSESSMENTS OF COMPETENCE – NOTICE OF FAILURE

To be completed by examiner

You are hereby notified that you have failed the ..... for the following reasons:

.....

.....

In accordance with Part FCL an Approved Training Organisation shall determine and deliver the required refresher/ remedial training prior to the applicant reattempting the skill test, proficiency check or assessment of competence. The applicant must provide evidence of this training to the examiner who conducts the next test, check or assessment of competence.

Minimum training recommended by the Examiner:

.....

I understand that I have failed the items notified above.

I understand that I may not exercise the privileges of my ..... following the failure of this test, check or assessment of competence until the successful completion of training and a further test, check or assessment of competence.

Received (Applicant) Signature: ..... Date: .....

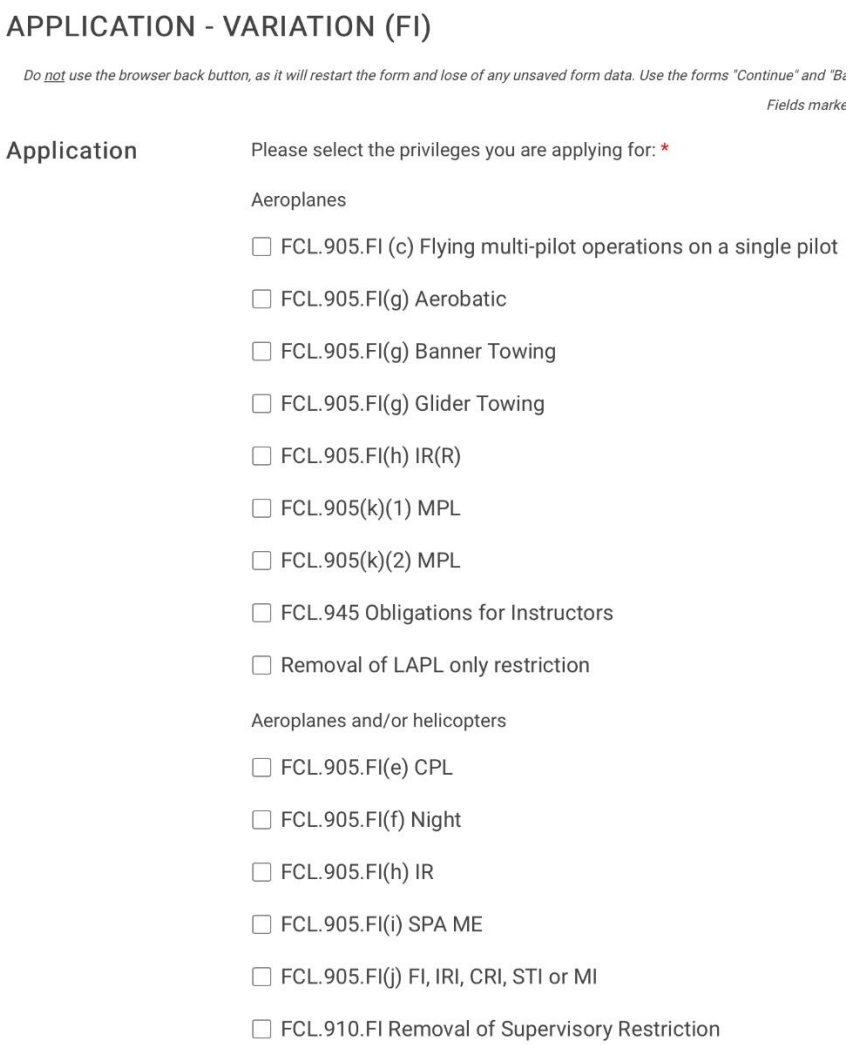
PLEASE REFER TO FALSE REPRESENTATION STATEMENT ON PAGE 1

Civil Aviation Authority Regulation 6

Regulation 6(5) of the Civil Aviation Authority Regulations 1991 as follows: Any person who has failed any test or examination which he is required to pass before he is granted or may exercise the privileges of a personnel licence may within 14 days of being notified of his failure request that the Authority determine whether the test or examination was properly conducted. In order to succeed you will have to satisfy the Authority that the examination or test was not properly conducted. Mere dissatisfaction with the result is not sufficient reason for appeal.

SRG 2159 Application for the issue, renewal, revalidation or variation of an instructor certificate (on-line form)

Below is a screen-shot of what can be applied for using this on-line form.



APPLICATION - VARIATION (FI)

Do not use the browser back button, as it will restart the form and lose of any unsaved form data. Use the forms "Continue" and "Ba

Fields marke

Application

Please select the privileges you are applying for: *

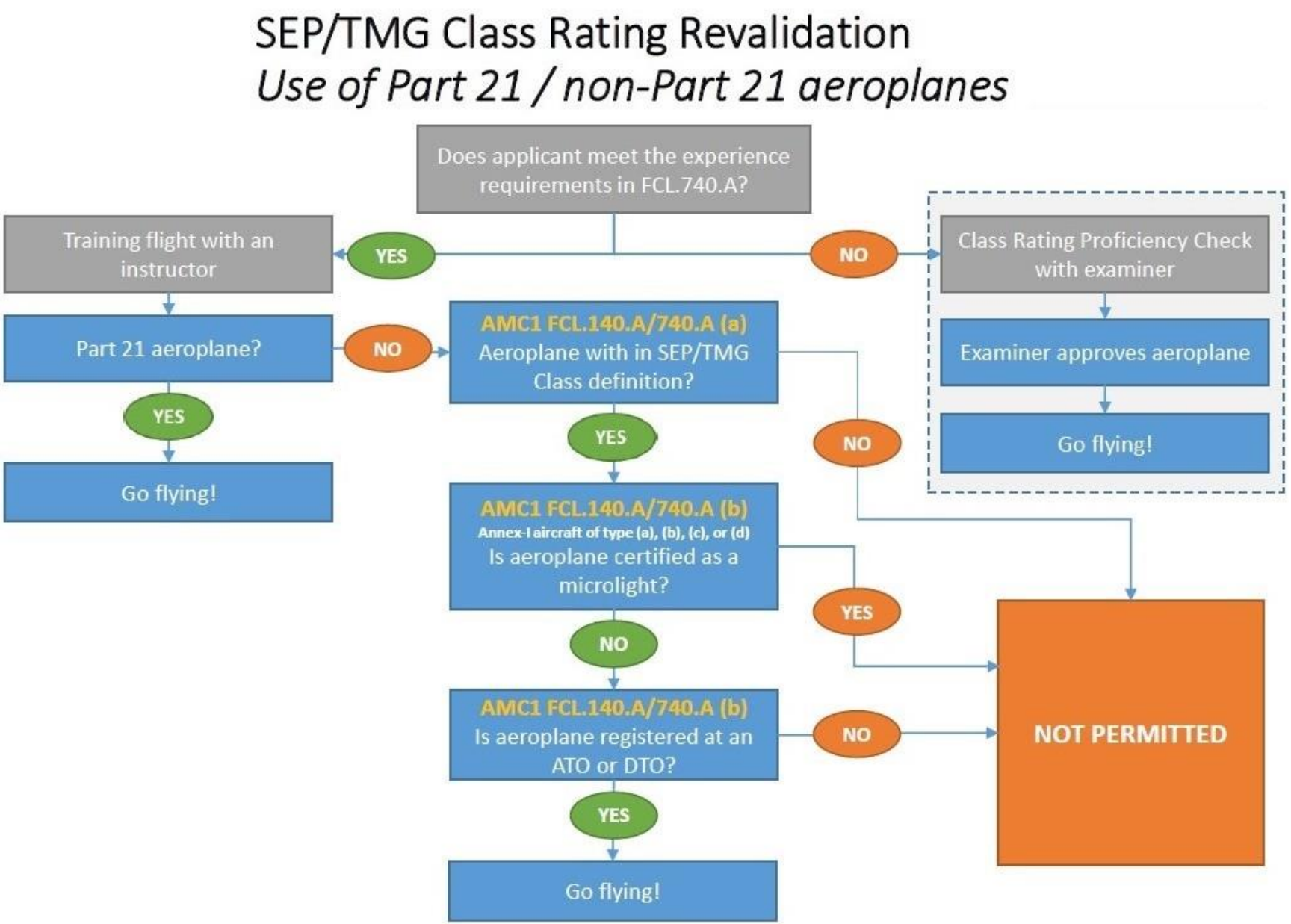
Aeroplanes

- ☐ FCL.905.FI (c) Flying multi-pilot operations on a single pilot
- ☐ FCL.905.FI(g) Aerobatic
- ☐ FCL.905.FI(g) Banner Towing
- ☐ FCL.905.FI(g) Glider Towing
- ☐ FCL.905.FI(h) IR(R)
- ☐ FCL.905(k)(1) MPL
- ☐ FCL.905(k)(2) MPL
- ☐ FCL.945 Obligations for Instructors
- ☐ Removal of LAPL only restriction

Aeroplanes and/or helicopters

- ☐ FCL.905.FI(e) CPL
- ☐ FCL.905.FI(f) Night
- ☐ FCL.905.FI(h) IR
- ☐ FCL.905.FI(i) SPA ME
- ☐ FCL.905.FI(j) FI, IRI, CRI, STI or MI
- ☐ FCL.910.FI Removal of Supervisory Restriction

Appendix 10: Use of Non-Part 21 Aircraft for Training



UK Part-FCL extract: AMC1 FCL.140.A & FCL.740.A

AMC1 FCL.140.A; FCL.140.S; FCL.740.A(b)(1)(ii) Recency and revalidation requirements

ED Decision 2020/005/R

All hours flown on aeroplanes or sailplanes that are subject to a decision as per Article 2(8) of the Basic Regulation or that are specified in Annex I to the Basic Regulation should count in full towards fulfilling the hourly requirements of points FCL.140.A, FCL.140.S, and FCL.740.A(b)(1)(ii) under the following conditions:

(a) the aircraft matchesthe definition and criteria of the respective Part-FCL aircraft category, class, and type ratings; and

(b) the aircraft that is used for training flights with an instructor is an Annex-I aircraft of type (a), (b), (c), or (d) that is subject to an authorisation specified in points ORA.ATO.135 or DTO.GEN.240.

NOTES TO INSTRUCTORS & EXAMINERS

1. AMC1 FCL.140.A / FCL.740.A extract above can be found in the LAPL(A) section of the regulation
2. Annex I aircraft under EASA are now described in UK Part-FCL as **non-Part 21 aircraft**
3. Requirements regarding non-Part 21 aircraft also applies to refresher training flight for LAPL(A) recency
4. FCL.140.A/FCL.740.A: 'Training flight with an instructor' **does not** need to be carried out under the auspices of an ATO/DTO: instructor should check the aircraft is registered at an ATO/DTO
5. LAA Permit to Fly aeroplanes may already be registered with the Light Aircraft Association Declared Training Organisation; check with LAA Head of Training

However, the is some contradiction in this published on the CAA website:

There has been a long-standing GA Programme item to look at further liberalising the use of smaller GA permit aircraft for commercial operations that consist of flight training and/or their use for self-fly hire.

*In November 2015, the CAA published **ORS1143** to permit owners or joint owners of permit aircraft to receive any type of training in their own aircraft as a 'quick win' approach in advance of a wider piece of work on training in permit to fly aircraft. **ORS1143** has now been discontinued because the substantive effect of it is embodied in the **ANO 2016** insofar as joint owners may now pay for training in their own aircraft.*

*Flying instruction and hire of aircraft, is considered to be a commercial operation. Article 42 of the **ANO 2016** states that aircraft on National Permit to Fly must not fly for commercial operations or for hire without the permission of the CAA. Currently we permit the use of 'Type Approved' aircraft to carry out these specific operations through a General Permission contained within Official Record Series 4 (**ORS4**) **1554**.*

After substantial consultation with internal and external stakeholders, we now allow flight instruction and self-fly hire to utilise aircraft flying in accordance with a National Permit to Fly subject to specified conditions. This relaxation has been published through an additional General Permission and is designed to sit alongside the General Permission already in place for Type Approved microlight's and gyroplanes.

This permission does not apply to flight instruction and examination where the recipient does not hold a licence, except when the recipient is:

The registered owner or joint-owner, or
A registered shareholder of the company of which owns the aircraft, or is the spouse or child of a registered sole or joint owner.

*Since with **ANO 2016**, Permit aircraft can be used for training if they are the owner as this is considered to be a non-commercial operation. Commercial operations being defined in Article 7. The term 'Commercial Operation' is used now, which removes complexity from situations involving legitimate joint-owned aircraft when payments are made by the owner of the aircraft (for example to an instructor) such that they remain non-commercial.*

For amateur built aircraft that are not type approved, ab-initio training is not allowed at this time and will be subject to further future consideration. Nevertheless, if the recipient or candidate already holds a valid license for the same aircraft category, then flight instruction and examination will be allowed.

Introductory Flights in accordance with Article 15 of the ANO will only be permitted on aircraft that are either "Type Approved" or is a type formerly holding a UK Certificate of Airworthiness, in respect of which, there is a 'Type Responsibility Agreement' with the CAA under BCAR A5-1 and the operator will have entered into an arrangement with the TRA holder for such operation.

*This permission does not apply to flight instruction or examination in Ex-Military aircraft that are operated in accordance with **CAP 632**, since these are addressed by separated arrangements within **CAP 632** and through the Aeronautical Information Circular W 055/2016.*

Appendix 11: Typical Instructor Assessments of Competence

1: A Typical CRI (SE) AoC

A typical scenario for a CRI AoC is that the examiner will play the part of a pilot who has never flown the aircraft type being used on the assessment, but has experience of other SEP types. The applicant will need to determine what training he needs, and highlight the differences both on the ground in briefings, and in the air.

Long Brief (Lesson)

This will typically be given to the applicant 2 or 3 days before the assessment. No longer than 45 mins. Common topics are:

- Describe an accident of the aircraft type to be used in the AoC. Show how the Threats & Errors and their Managmement contributed to the accident.

Pre-Flight Brief

This will usually be given on the day or perhaps the day before, and for the CRI will likely be:

- Stalling
- PFL

It should last 10-15 minutes and be punchy and directly related to the flight it precedes. It will lay out the order of the flight and who will do what.

Flight

The assessment will probably begin at the holding point, with the start up and taxy not being assessed. Then the following items are likely to be assessed:

- A pattered take-off
- The main lesson (stalling or PFL) either demonstrated, pattered or taught. They may be student practice to be analysed and retrained afterwards.
- Any other air exercise (usually stalling or PFL if not already covered)
- Pattered circuit.

Debrief

The applicant will conduct a short debrief of the examiner's performance.

Oral Questions

A question and answer session with the examiner (see below and in Standards Document 10).

Typical CRI(SE) Theoretical Knowledge Questions

Air Law

1. What classes of airspace are there in the UK? Where would you find each type?
2. What airspace class is the Heathrow CTR and what must I do to enter. What does that class of airspace mean?
3. List the airworthiness documents for a typical light aircraft and add some detail.
4. What are the revalidation and renewal requirements for an SEP (land) rating?
5. What are the dimensions of an ATZ and MATZ. What rules surround their use?
6. If you have been unable to contact the tower/info due to a busy radio frequency, may you enter an ATZ anyway?
7. What does the * mean next to the symbol for a danger area?
8. Explain 'differences' and 'familiarisation' training in relation to SEP aircraft.
9. What are the rules concerning flight near congested areas and open air assemblies?
10. How long does a CRI certificate remain valid. How can it be revalidated or renewed?

Aircraft General Knowledge

11. Show with the use of a diagram how an ASI and VSI work.
12. State the properties of a gyroscope. Show how they are used in the principles of operation of the aircraft gyroscopic instruments.
13. Why does an AI gyro spin at around 20 000 rpm whereas a turn co-ordinator gyro spins at around 9000 rpm?
14. Explain how and why carburettor ice occurs.
15. Explain spark retard and impulse coupling during engine start.
16. In an aircraft with a low drag line and a high thrust line, how is the couple balanced?
17. What is the purpose of differential ailerons?

Flight Performance & Planning

18. What calculations should be made for take-off in a SEP aeroplane?
19. Show how to calculate the mass and balance for a typical SEP aeroplane.
20. Must a calculation be performed before every flight?
21. Without making any calculations, how would the take-off C of G position change if a heavy bag was placed in the rear?
22. What fuel requirements are required for a VFR flight?

Human Performance and Limitations

23. What causes a pilot to suffer from hypoxia? How can this be remedied?
24. What causes a pilot to suffer from hyperventilation? How can this be remedied?
25. Explain why a highly motivated student is more likely to succeed than a disinterested one.
26. What personal factors should a pilot consider before flight?
27. What is the difference between a threat and an error?

Meteorology

28. State the ISA.
29. Explain how a sea breeze occurs by day.
30. What happens to the surface wind following the passage of a cold front?
31. State the hazards of a thunderstorm to aviation.

Navigation

32. Describe the principles of operation of a VOR.
33. Explain the Standard Closing Angle method of track adjustment.

Principles of Flight

34. Why does an aircraft in S&L flight slow down when the nose is pitched up?
35. Draw a graph of lift vs angle of attack for a basic wing. Then for the addition of flaps. Then slats.
36. Why is there low pressure on the upper surface of an aerofoil?
37. Explain the forces on a propeller.
38. How can a wing designer reduce induced drag?
39. When does an aircraft suffer a sudden loss of induced drag?
40. What does it mean when the balance ball is in the middle?
41. What is the difference between thrust and power?
42. Does flight at Vy require flight at maximum excess power or maximum excess thrust?

Training Administration

43. State the hours required for an SEP course. What is the solo/dual breakdown?
44. State the test profile for an SEP skill test or proficiency test.

Advice to Applicants for an CRI (SE) AoC

1. Have the necessary paperwork signed and ready: **SRG 5018** (Course completion certificate, see below) & **SRG 1169** (Examiner's Report). **Note:** Both of these forms require a signature from the head of training of the ATO.

CAA5018 Instructor Training Course Completion Certificate in Accordance with Part-FCL

This form is intended for use in the provision of evidence in support of an application made to the CAA using the CAA's online application service. Once completed the form should be scanned or photographed and uploaded by the applicant as part of an online application to the CAA.

FALSE REPRESENTATION STATEMENT
It is an offence under the UK Air Navigation Order to make, with intent to deceive, any false representation for the purpose of procuring the grant, issue, renewal or variation of any certificate, licence, approval, permission, or other document. This offence is punishable on summary conviction by a fine and on conviction on indictment with an unlimited fine or imprisonment or both.

GUIDANCE NOTES

GUIDANCE NOTE 1: Authorised signatories

An authorised signatory acts as a representative of the Head of Training, authorised by the Head of Training or through approved procedures to confirm that the stated training has been conducted by the Approved Training Organisation (ATO). The ATO must maintain a record of those so authorized.

GUIDANCE NOTE 2: Which sections of the course completion to complete

You are only required to complete and print the sections relevant to your application.

Application applied for	Sections to be fully completed
FI initial issue	1, 2, 3, 5
FI/CRI/IRI variation	FI - 1, 6(i) or 6(ii) / CRI - 1, 6(vi) / IRI - 1, 6 (vii)
FI/CRI/IRI renewal or revalidation	1, 5(v), 5(vi)
CRI/IRI/FTI initial issue	1, 2, 5(i), 5(ii), 5(iii), 5(iv)
MCCI initial issue or renewal	1, 4, 7
MCCI revalidation	1, 7
MCCI variation	1, 6(v), 7
FTI revalidation	1, 5(v)
FTI renewal	1, 5(v)
Mountain rating instructor initial issue	1, 2, 3, 5
TRI / SFI / STI initial issue	1, 2, 5
TRI / SFI renewal	1, 2, 5
TRI / SFI revalidation	1, 5
TRI / SFI variation	1, 2, 6
STI renewal	1, 5

1. APPLICANT DETAILS — To be completed by the Training Provider

CAA Personal Reference number (if known): 123456A Date of Birth: 01/05/1997

Title: Ms Forename(s): Ellie Surname: Vaytor

This application is for (please select all that apply): Initial issue [X] Renewal [ ] Revalidation [ ] Variation [ ]

2. PRE-REQUISITES — To be completed by the Training Provider

I certify that (name) Ellie Vaytor has met the pre-requisites for (certificate(s)) CRI (SE)

I further certify that I have examined the Pilot's logbook and confirm they have met the pre-requisite hours requirements: Yes [X] No [ ] N/A [ ]

The following hours have been flown and verified in the pilot's logbook (please provide a summary of total hours as per the requirements in the regulation):

300 hours total time on aeroplanes.
30 hours PIC on SEP (land).

Training Provider Details:

Name of Approved Training Organisation (ATO) (if applicable): M Pennage Flying School ATO number (if applicable): 6666

Competent Authority issuing approval (if applicable) : UK CAA

Name of Head of Training (or authorised signatory): A Vulture

Signature of Head of Training or authorised signatory: [signature] Date: 24/04/2023

3. Flight or Mountain Rating Instructor (FI/MI) Pre-Entry Flight Test — To be completed by the Instructor

I confirm the pilot has satisfactorily completed a pre-entry flight test on (date):

I recommended the pilot for the specified course (select one): Flight Instructor (FI) [ ] Mountain Rating Instructor (MI) [ ]

Name of FI/MI who conducted the flight test:

Instructor reference number: Competent authority issuing certificate:

Signature of Instructor: Date

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Applicant's CAA Personal Reference number: 123456A

4. MCCI Course Instructor (if applicable) — To be completed by the Training Provider

I can confirm that I have reviewed the pre-entry requirements alongside the applicant's experience and can confirm that the applicant meets Part-FCL.915.MCCI pre-entry requirements and FCL.930.MCCI(a), (c) and/or FCL.940.MCCI (where appropriate) and therefore propose that the applicant proceed to formal observation by CAA or a nominated deputy.

Training Provider Details:

Name of Approved Training Organisation (ATO) (if applicable): ATO number (if applicable) :

Competent Authority issuing approval (if applicable) :

Name of Head of Training (or authorised signatory):

Signature of Head of Training or authorised signatory: Date

5. TRAINING COURSE DETAILS — To be completed by the Training Provider

5(i) Theoretical knowledge — To be completed by the Training Provider

10 hours of theoretical knowledge (TK) instruction

The applicant has satisfactorily completed: *(select one):* Full TK training [X] Reduced TK training [ ] Not applicable [ ]

The applicant has completed reduced course of TK training on the basis of: (if applicable)

5(ii) Teaching and learning — To be completed by the Training Provider

25 hours of teaching and learning completed

The applicant has satisfactorily completed: *(select one)* Full teaching and learning [X] Reduced teaching and learning [ ] Not applicable (exempt) [ ]

The applicant has completed a reduced course of teaching and learning in accordance with FCL.915(c)(1) on the basis of: (if applicable)

5(iii) Technical training (IRI, CRI initial issue) — To be completed by the Training Provider

The applicant has satisfactorily completed 10 hours of technical theoretical training

5(iv) Flight training — To be completed by the Training Provider

I confirm the pilot has satisfactorily completed an approved course of training in accordance with Part-FCL for the following:

i) FI(A) [ ] FI(H) [ ] FI(AS) [ ] FCL.900C FI(A) [ ] FCL.900C FI(H) [ ]

ii) Class Rating Instructor CRI SE [X] ME [ ]

iii) Instrument Rating Instructor IRI(A) [ ] IRI(H) [ ] IRI (AS) [ ]

iv) Flight Test Instructor [ ]

v) Mountain Rating Instructor (FCL.930.MI(a)) [ ]

vi) Type Rating Instructor TRI(A) (Please specify type):

vii) Type Rating Instructor TRI(H) (Please specify type):

viii) Type Rating Instructor TRI(PL) (Please specify type):

ix) Type Rating Instructor issued in accordance with FCL.725(e) (Please specify type)

x) Synthetic Flight Instructor SFI (Please specify type):

xi) Synthetic Flight Instructor SFI (SPA) [ ] (MPA) [ ] (H) [ ] (PL) [ ]

xii) Synthetic Training Instructor STI A [ ] H [ ]

Course start date: 14 Apr 2023 Course end date: 22 Apr 2023

The applicant has satisfactorily completed: (select one) Full flight training [ ] Reduced flight training [ ] Not applicable [ ]

The applicant has completed a reduced course of flight training on the basis of: (if applicable)

The course consisted of 3.5 hours of flight instruction of which 0 hours instrument ground time in a FTD 2/3 or FNPT I or FNPT II/III or FFS.

FSTD identification number of simulator used (which must be issued in accordance with UK Regulation No. 1778/2011)

Competent Authority issuing qualification certificate for the simulator:

Training Provider Details:

Name of Approved Training Organisation (ATO) (if applicable): M Pennage Flying School ATO number (if applicable) : 6666

Competent Authority issuing approval (if applicable) : UK CAA

Name of Head of Training (or authorised signatory): A Vulture

Signature of Head of Training or authorised signatory: [signature] Date 24/04/2023

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Applicant's CAA Personal Reference number: 123456A

5)v) Instructor refresher training course — **To be completed by the Training Provider**

I confirm the pilot has satisfactorily completed the instructor refresher training course on ..... (date).

For the revalidation ☐ or renewal ☐ of an instructor Certificate in accordance with Part-FCL

Training Provider Details

Name of Approved Training Organisation (ATO): (if applicable): ..... ATO number (if applicable): .....

Competent Authority issuing approval (if applicable) .....

Name of Head of Training (or authorised signatory): .....

Signature (Head of Training): ..... Date: .....

5)vi) Instructor revalidation/renewal information — **To be completed by the Examiner**

I can confirm that the pilot has met the requirements of Part-FCL for the revalidation/renewal of the following Instructor:

FI(A) ☐ FI(H) ☐ FI(As) ☐ CRI ☐ IRI ☐ SFI ☐ STI ☐ TRI ☐ MCCI ☐ MI ☐

The Certificate of Revalidation has been signed and the rating/certificate is valid until (date) .....

Examiner's Name: ..... Examiner's Number: .....

Competent Authority issuing Examiner's Certificate: .....

Signature (Examiner): ..... Date: .....

6) Training Course/Information Details — **To be completed by the Training Provider**

6)i) Flight instructor variation (course)

I certify that the pilot has satisfactorily met the variation hours requirement(s) in accordance with Part-FCL for the following:

Extend privileges to flight instructor certificate to include:

FCL.905.FI(h) IR ☐ FCL.905.FI(h) IR(R) ☐ FCL.905.FI(i) SPA ME ☐

Please note section 5 iv) must be completed with the relevant course information

Training Provider Details:

Name of Approved Training Organisation (ATO) (if applicable): ..... ATO number (if applicable): .....

Competent Authority issuing approval (if applicable) : .....

Name of Head of Training (or authorised signatory): .....

Signature of Head of Training or authorised signatory: ..... Date .....

6)ii) Flight instructor variation (other) — **To be completed by the Instructor**

I certify that the pilot has satisfactorily met the variation requirement(s) in accordance with Part-FCL for the following:

Extend privileges to flight instructor certificate to include:

FCL.905.FI(c) Flying multi-pilot operations on a single pilot aircraft ☐ FCL.905.FI(e) CPL ☐ FCL.905.FI(j) FI, IRI, CRI, STI or TRI ☐

Signature of Instructor: ..... Date .....

I certify that the pilot has satisfactorily met the variation requirement(s) in accordance with Part-FCL for the following:

Extend privileges to flight instructor certificate to include:

FCL.905(k)(1) MPL ☐

I certify that the pilot has satisfactorily completed at least 500 hours of flight time as a pilot in aeroplanes, including at least 200 hours of flight instruction

Signature of Instructor: ..... Date .....

I certify that the pilot has satisfactorily met the variation requirement(s) in accordance with Part-FCL for the following:

Extend privileges to flight instructor certificate to include:

FCL.905(k)(2) MPL ☐

I certify the pilot holds a multi-engine aeroplane IR and the privilege to instruct for an IR ☐ And

I confirm the pilot has satisfactorily completed at least 1500 hours of flight time in multi-crew operations ☐ or

Is already an FI qualified to instruct on ATP(A) or CPL(A)/IR integrated courses and has completed a structured course consisting of the following training ☐ :

MCC qualification

Observation of five sessions of flight instruction in Phase 3 of an MPL course

Observation of five sessions of flight instruction in Phase 4 of an MPL course

Observation of five operator recurrent line-oriented flight training sessions

The content of the MCCI course

Signature of Instructor: ..... Date .....

Applicant's CAA Personal Reference number: 123456A

I certify that the pilot has satisfactorily met the variation requirement(s) in accordance with Part-FCL for the following:

FCL.905.FI(f) Night ☐ FCL.905.FI(e) Banner Towing ☐ FCL.905.FI(g) Glider Towing ☐ FCL.905.FI(g) Aerobatic ☐

Date of demonstration flight: .....

Name of Instructor: ..... Instructor Reference Number: .....

Competent Authority issuing Instructor's Certificate: .....

Signature of Instructor: ..... Date .....

6)iii) TRI variation — **To be completed by the Training Provider**

I certify that the pilot has satisfactorily met the variation requirement(s) to extend privileges of TRI in accordance with Part-FCL for the following:

FCL.905.TRI(2) ☐ FCL.905.TRI(3) (SPHPA) SP to MP ☐

FCL.910.TRI(b)/(c) (please specify type): .....

FCL.910.TRI(a) FSTD ☐ FCL.910.TRI(a) Line Flying (LIFUS) ☐ FCL.910.TRI(b) Aircraft ☐

FCL.910(c)(2) TRI SPH to MPH ☐ FCL.910.TRI(a) Aircraft Takeoffs and Landings Only ☐

Training Provider Details:

Name of Approved Training Organisation (ATO) (if applicable): ..... ATO number (if applicable): .....

Competent Authority issuing approval (if applicable) : .....

Name of Head of Training (or authorised signatory): .....

Signature of Head of Training or authorised signatory: ..... Date .....

6)iv) SFI variation — **To be completed by the Training Provider**

I certify that the pilot has satisfactorily met the variation requirement(s) to extend privileges of SFI in accordance with Part-FCL for the following:

FCL.905.SFI(b) (SPHPA) SP to MP ☐

FCL.910.SFI (please specify type): .....

Training Provider Details:

Name of Approved Training Organisation (ATO) (if applicable): ..... ATO number (if applicable): .....

Competent Authority issuing approval (if applicable) : .....

Name of Head of Training (or authorised signatory): .....

Signature of Head of Training or authorised signatory: ..... Date .....

6)v) MCCI variation — **To be completed by the Training Provider**

I certify that the pilot has satisfactorily met the variation requirement(s) to extend privileges of MCCI in accordance with Part-FCL for the following:

FCL.910.MCCI (please specify type): .....

Training Provider Details:

Name of Approved Training Organisation (ATO) (if applicable): ..... ATO number (if applicable): .....

Competent Authority issuing approval (if applicable) : .....

Name of Head of Training (or authorised signatory): .....

Signature of Head of Training or authorised signatory: ..... Date .....

6)vi) CRI variation — **To be completed by the Training Provider**

I certify that the pilot has satisfactorily met the variation requirement(s) to extend privileges of CRI in accordance with Part-FCL for the following:

FCL.905.CRI (Please specify class or type): .....

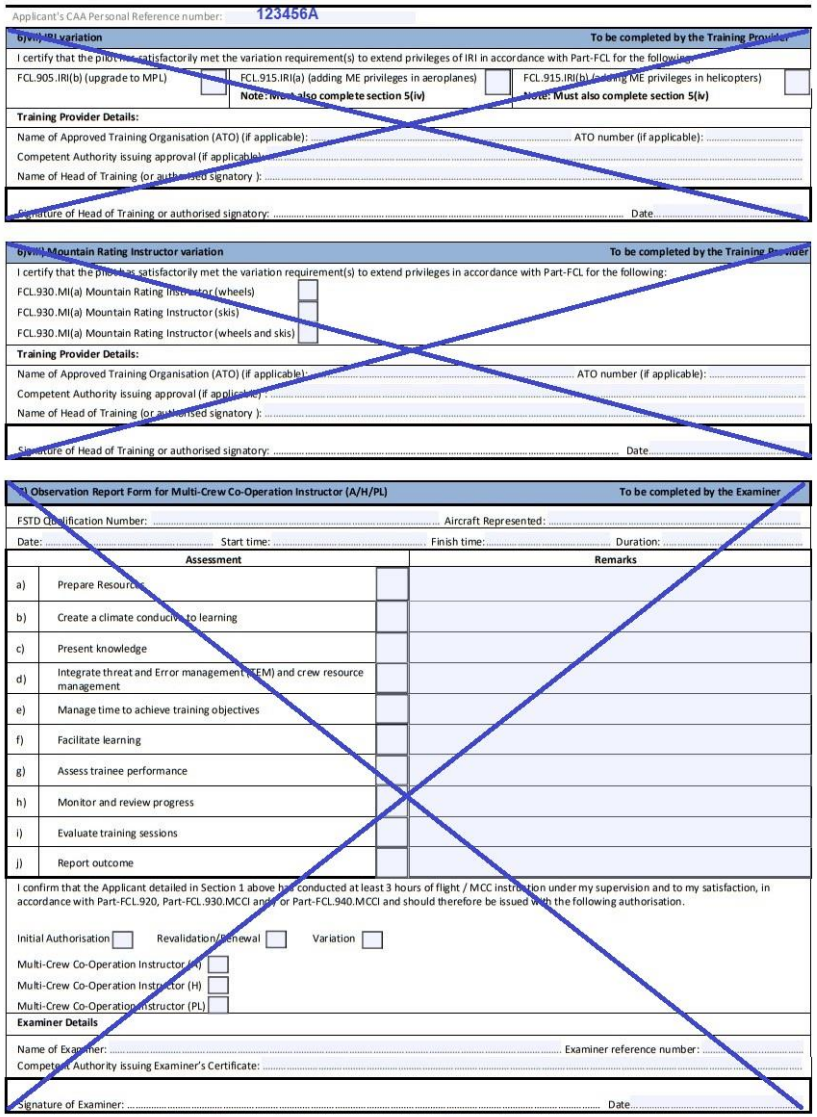
FCL.905.CRI(a) Banner Towing ☐ FCL.905.CRI(a) Glider Towing ☐ FCL.905.CRI(a) Aerobatic ☐

FCL.905.CRI(ba) Flying multi-pilot operations on a single pilot (please specify class or type): .....

Date of demonstration/assessment flight: .....

Name of Instructor/Examiner ..... Instructor/Examiner reference number .....

Signature of Instructor/Examiner ..... Date .....



Applicant's CAA Personal Reference number: 123456A

6)(vii) IRI variation — **To be completed by the Training Provider**

I certify that the pilot has satisfactorily met the variation requirement(s) to extend privileges of IRI in accordance with Part-FCL for the following:

FCL.905.IRI(b) (upgrade to MPL) ☐	FCL.915.IRI(a) (adding ME privileges in aeroplanes) ☐ **Note: Must also complete section 5(iv)**	FCL.915.IRI(b) (adding ME privileges in helicopters) ☐ **Note: Must also complete section 5(iv)**

Training Provider Details:

Name of Approved Training Organisation (ATO) (if applicable): ..... ATO number (if applicable): .....

Competent Authority issuing approval (if applicable): .....

Name of Head of Training (or authorised signatory): .....

Signature of Head of Training or authorised signatory: ..... Date .....

6)(viii) Mountain Rating Instructor variation — **To be completed by the Training Provider**

I certify that the pilot has satisfactorily met the variation requirement(s) to extend privileges in accordance with Part-FCL for the following:

FCL.930.MI(a) Mountain Rating Instructor (wheels) ☐

FCL.930.MI(a) Mountain Rating Instructor (skis) ☐

FCL.930.MI(a) Mountain Rating Instructor (wheels and skis) ☐

Training Provider Details:

Name of Approved Training Organisation (ATO) (if applicable): ..... ATO number (if applicable): .....

Competent Authority issuing approval (if applicable): .....

Name of Head of Training (or authorised signatory): .....

Signature of Head of Training or authorised signatory: ..... Date .....

7) Observation Report Form for Multi-Crew Co-Operation Instructor (A/H/PL) — **To be completed by the Examiner**

FSTD Qualification Number: ..... Aircraft Represented: .....

Date: ..... Start time: ..... Finish time: ..... Duration: .....

	Assessment		Remarks
a)	Prepare Resources	☐	
b)	Create a climate conducive to learning	☐	
c)	Present knowledge	☐	
d)	Integrate threat and Error management (TEM) and crew resource management	☐	
e)	Manage time to achieve training objectives	☐	
f)	Facilitate learning	☐	
g)	Assess trainee performance	☐	
h)	Monitor and review progress	☐	
i)	Evaluate training sessions	☐	
j)	Report outcome	☐	

I confirm that the Applicant detailed in Section 1 above has conducted at least 3 hours of flight / MCC instruction under my supervision and to my satisfaction, in accordance with Part-FCL.920, Part-FCL.930.MCCI and/or Part-FCL.940.MCCI and should therefore be issued with the following authorisation.

Initial Authorisation ☐ Revalidation/Renewal ☐ Variation ☐

Multi-Crew Co-Operation Instructor (A) ☐

Multi-Crew Co-Operation Instructor (H) ☐

Multi-Crew Co-Operation Instructor (PL) ☐

Examiner Details

Name of Examiner: ..... Examiner reference number: .....

Competent Authority issuing Examiner's Certificate: .....

Signature of Examiner: ..... Date .....

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2. Make sure the aircraft is available and ready. Check weather minima.
3: Make sure your long briefing is ready and all visual aids are on hand.
4: Make sure you have a briefing room available for several hours.
5: Make sure your theoretical knowledge is good. Some examiners will go into great detail, other less so. See Standards Document 10.

GOOD LUCK!