Instructor Notes – Advanced Flying Training Course

Revision 1
September 2019

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0 Record of Amendments

Rev. No	Date Entered	Amended By

0.1 Revision Highlights

0.1.1 Revision 1, September 2019

New issue.

Contents

1 Advanced Flying Training Course

1.1 Introduction

The Advanced Flying Training Course is designed to train and assess the trainee in all items required for the issue of a VATSIM P5 rating.

Throughout the course the trainee is expected to self-study through the use of e-learning material, supplied BAVirtual training manuals and documentation and the supplied Baron 58 POH. The trainee will in this way gain the technical knowledge and understanding necessary to pass the theory examinations. Upon successful completion of the Ground School course the trainee may then progress to the Multi-Engine Conversion phase where handling techniques and operational skills will be developed in the Beech Baron 58 aircraft.

This phase will culminate in a short practical and written assessment. Thereafter the trainee will progress to the Instrument Flying phase, culminating in a final practical assessment.

The P5 rating will be issued upon successful completion of the Instrument Flying phase provided all elements of training (including requisite cross-country flying) have been identified as completed in the e-Learning Centre.

To be accepted for the Advanced Flying Training Course the trainee must:

- Be a BAVirtual member
- Hold VATSIM P1, P2 and P3 ratings
- Any other conditions required by the Flight Training Manager Advanced Flying Training

Course Overview

Ground Phase	
Section	**Subject**
Aircraft General Knowledge: Airframe & Systems, Electrics, Powerplant & Emergency Equipment	Powerplant (Piston)
Principles of Flight: Aeroplane	Stability, Controllability & Manoeuvrability Flight Control Systems
Meteorology	Mist & Fog Cold Weather Operations
Air Law & ATC Procedures	International Law: Conventions, Agreements & Organisations Rules of the Air Aeronautical Information Service
Aircraft General Knowledge: Instrumentation	Instrumentation: Introduction Pressure-Operated Instruments Gyroscopic Instruments Magnetic Compass

Ground Phase	
Radio Navigation	Radio Propagation Theory & Radar Distance Measuring Equipment (DME) Non-Directional Beacons (NDBs) & the Automatic Direction Finder (ADF) Very High Frequency Omnidirectional Range (VOR) Instrument Landing System (ILS) Area Navigation (RNAV) & Global Positioning System (GPS)
Human Performance	Human Factors Introduction Aviation Visual Illusions Situational Awareness & Attention
Flight Performance & Planning	IFR Flight Planning
Instrument Procedures	Instrument Departures Holding & Manoeuvring Instrument Approaches Instrument Approach Charts Instrument Minima Visual Manoeuvring (Circling)

Multi-Engine Conversion Phase	
Section	**Subject**
1	Aeroplane Systems & Engine Systems
2	Constant Speed Propellers & Feathering
3	Multi-Engine Flight Principles
4	Minimum Control & Safety Speeds
5	Mass & Balance, Performance & Limitations
6	Effects of Engine Failure on Systems & Performance
7	MEP Class Rating Check

Instrument Flying Phase	
Section	**Subject**
1	Instrument Flying Introduction
2	NDB Tracking
3	VOR Tracking
4	Instrument Circuits
5	Instrument Stalling & Unusual Attitudes
6	Asymmetric Instrument Circuits
7	IFR Route Flight
8	IR Skill Test

Assessment is continuous throughout the course. Each flying detail sets out the objectives and the standard of knowledge and skill required to be demonstrated during the session. Instructors will be making this assessment during the sessions. VATSIM also requires specific assessment of competencies for issue of the rating to comply with VATSIM PTD requirements. These events are set out below:

Phase	Event	Time
Ground School Phase	Technical Examination	All subjects complete
Multi-Engine Conversion Phase	Technical Examination, MEP Class Rating Check	After Lesson 6
Instrument Flying Phase	Skill Test	End

The trainee is responsible for his/her own learning. Various training aids are available and Instructors will be available during the Ground School phase to answer questions. The trainee is responsible for allocating time to study the training material.

The continuous assessment process will identify training effectiveness and highlight areas for trainee development. These will be noted by the Instructors as the course progresses. Trainees will be made aware of these development areas and they will be recorded in the trainee's Moodle file. This will assist the trainee in targeting specific areas of self-study and preparation. If a lack of progression in key areas of skill, knowledge or handling is identified the Instructor will make the trainee aware of this informally during the de-brief.

All trainees need to achieve the standards defined in the VATSIM PTD P5 syllabus. In addition, they must achieve at least Satisfactory standard in all elements and phases of the course.

1.1.1 Additional Notes Specific to the BAVirtual Advanced Flying Training Course

1.1.1.1 Aims

1. To create a course of 22 flying details which is fully compliant with VATSIM, EASA, CAA and BAVirtual policies.

2. To use interactive training aids and video presentations in the briefings and theory modules to improve the trainees' learning.

3. To create skill checks at regular points in the course in order to ensure that trainees have attained the skills required to move on to the next stage of the course. These are listed under Session Proficiency Criteria for each detail.

4. To avoid repeating unnecessarily the knowledge and skills gained in the Ground School phase

5. To make the course a practical preparation for Jet Orientation training.

1.1.1.2 Trainee Starting Point

- The course is based on the assumption that all trainees starting the course have completed VATSIM ratings P1, P2 and P3 and are proficient in visual navigation and light SEP aircraft handling. It is designed to apply this proficiency to multi-engine aircraft handling and instrument flying, as well as training non-technical skills for normal and abnormal situations.

- It is assumed that trainees commence the Flight Training phase having completed the Ground School course, after which they are proficient in terms of IFR procedural knowledge, IFR aircraft equipment, general advanced-level aviation technical knowledge and rules and procedures pertaining to IFR flight.

1.1.1.3 Course Structure

The course consists of 22 flying details:

- Details 1 and 2 – Normal Handling and type familiarisation
- Details 3 to 6 – Asymmetric Handling
- Detail 7 – MEP Class Rating check
- Details 8 and 9 – Basic Instrument Flying
- Details 10 to 13 – Raw Data Tracking and Holding
- Details 14 and 15 – Instrument Approach Procedures
- Details 16 and 17 – Upset Prevention & Recovery
- Details 18 and 19 – Asymmetric Instrument Flight
- Details 20 and 21 – IFR Route Flying
- Detail 22 – IR Skill Test

Long briefings for each flying detail are provided via the E-Learning Centre and trainees are expected to prepare for each detail by completing this material. As such, the pre-flight briefing will normally take the form of confirmation and clarification of technical knowledge and discussion of effective techniques and non-technical skills. Teamviewer/Powerpoint and Cosketch may be used to study the various items in the details.

Each session typically will be in the region of 1½ hours duration, allowing for approximately 10-15 minutes briefing, 1 hour flying and 10-15 minutes debriefing.

1.1.1.4 Detail Format

The details are written so as to allow a natural progression for an average trainee. However, a degree of flexibility is required for the trainee to achieve the most out of the detail and to achieve this the instructor may vary the running order as required.

For very able trainees it may be possible to combine multiple details in to a single session. This is perfectly acceptable provided the instructor is satisfied the trainee meets or exceeds the Proficiency Criteria for each such detail. Where multiple details are combined in to a single session, the instructor must record a grade and any relevant notes for each such detail in Moodle.

1.1.1.5 Format of the Instructor Session Notes

For each detail there is an overview of the contents for the detail and briefing material. Some Instructor Notes are found in the Session Guide in this manual and more in-depth guidance on the “how to” is found in the POH. You will find for each detail:

- Objective
- Training topics
- Basic running order
- Briefing material available
- Proficiency Criteria

- Instructor notes (session guide) (only available to the Instructor)
- Additional information

1.1.1.6 Moodle Grading

All reports must be entered in to Moodle. A Satisfactory score is to be used when the Proficiency Criteria for the detail have been satisfied. If the detail was not completed or PC have not been met, a grade of “Progressing” should be awarded. “Unsatisfactory” should only be used where the trainee’s performance is well below the required standard, no progress at all is being made and/or the trainee’s attitude raises cause for concern. Any Instructor awarding an “Unsatisfactory” grade for any detail must also forward details to the FTM Advanced Flying Training.

If a detail requiring further practice is revisited, it must be re-graded as appropriate and notes added below the original comments after a suitable break marker (e.g. a line of dashes).

1.1.1.7 Briefing Material

Trainee briefing material may be found in the Course Documents and Resources folder at the top of the course. Instructor briefing material may be found in the Instructor Resources folder.

1.2 Ground School Phase

1.2.1 Policy

1.2.1.1 Objectives

The aim of the Ground School phase is to:

- Acquire appropriate levels of technical and procedural knowledge
- Gain familiarity with instrument flight procedures and regulations

1.2.1.2 Standard Required on Completion

On completion of the Ground School phase, the trainee should have:

- Achieved a pass in the Theoretical Knowledge examination
- Successfully completed all e-Learning modules

1.2.2 Course Description

The course and examination is conducted via the BAVirtual e-Learning "Moodle" system. Study is conducted via a series of interactive lesson modules which incorporate graphical, textual and audiovisual content. This allows the trainee to work at his/her own pace. Instructor assistance is available where required via Teamspeak and e-mail, as well as the BAVirtual forums.

All of the material required is available within the course on the e-learning system. Trainees should download manuals and other documentation in accordance with the course joining instructions.

Each lesson module contains questions designed to check progress and understanding of the content. There is a final multiple-choice examination, for which the pass mark is 80%. All examination questions are drawn from information contained within the course, the UK AIP, SERA, the UK ANO and VATSIM Code of Conduct.

1.2.3 Approved Course Examination Procedure

VATSIM courses for which approval has been granted by the VATSIM PTD have the following programme of BAVirtual examinations implemented by BAVirtual Flight Training.

1.2.3.1 Progress Tests

Progress questions are contained within each e-learning module. The purpose of the progress questions is to assess a candidate's understanding of the content within the module and ability to progress to each subsequent stage. The Progress Questions will generally, but not always, be multiple-choice. No record is kept of the candidate's answers and there is no limit on the number of attempts a candidate may make at a question, although the candidate must answer all questions within each module correctly in order for the module to be marked as complete within the e-learning system.

1.2.3.2 Qualifying Examination

On completion of the Ground School modules, each candidate will sit a Qualifying Examination. This will contain 40 multiple-choice questions. The examination questions will be distributed over the nine main subjects of the syllabus. The time allowed for completion is 45 minutes.

The questions for the examination will be drawn automatically from a question bank.

A record will be kept of results achieved on the Qualifying Examination. The pass mark for the Qualifying Examination is 80%, with no penalty marking.

1.2.3.3 Re-Sits

Where a candidate achieves less than 80% in the Qualifying Examination he/she shall re-sit the examination. Fresh questions shall be drawn for the re-sit.

One re-sit will be available automatically 7 days after the first attempt. If the candidate fails to achieve 80% or more at this second attempt, he/she will be debriefed by a BAVirtual instructor in order to establish an understanding of the material before further attempts will be unlocked.

1.2.3.4 Marking of Qualifying Examination

The Qualifying Examination will be marked automatically by the Moodle software. On successful completion of the Examination, the candidate will have the opportunity to review the incorrect answers and a debrief session with an Instructor will be offered. During this debrief all questions answered incorrectly will be reviewed to establish an understanding of the correct answer.

Where a question references a particular document (e.g. the UK AIP), candidates are permitted to refer to the document in question during the examination.

1.2.4 Ground School Programme

Advanced Flying Training Ground School Phase Overview	
Section	**Subject**
Aircraft General Knowledge: Airframe & Systems, Electrics, Powerplant & Emergency Equipment	**Powerplant (Piston)**
	The Piston Aeroplane Engine The Four-Stroke Cycle Valves Ignition The Carburettor Mixture Control Abnormal Combustion Induction System Icing Engine Performance Power Augmentation Devices
Principles of Flight: Aeroplane	**Stability, Controllability & Manoeuvrability**
	Static Stability Dynamic Stability Axes of Stability Longitudinal Stability Lateral Stability Directional Stability Stability Interaction Dutch Roll
	Flight Control Systems
	Aerodynamically-balanced Controls Trim Power-Assisted Controls Power-Operated Controls Flutter Aileron Drag
Meteorology	**Mist & Fog**
	Radiation Fog Advection Fog Frontal and Hill Fog Steam Fog
	Cold Weather Operations
	Icing Clean Aircraft Policy Recognising Icing Conditions Aircraft De-Icing and Anti-Icing Systems Ground De-Icing and Anti-Icing

Advanced Flying Training Ground School Phase Overview	
Air Law & ATC Procedures	**International Law: Conventions, Agreements & Organisations**
	Air Law ICAO The JAA and EASA The Air Navigation Order
	Rules of the Air
	European Rules of the Air Aerodrome Markings and Signs VMC and VFR Visual Flight Rules Airspace Classification Altimeter Setting Procedures Air Traffic Services
	Aeronautical Information Service
	Aeronautical Information Services AIP NOTAMs Using the AIS
Aircraft General Knowledge: Instrumentation	**Instrumentation: Introduction**
	Range and Accuracy Readability Types of Instruments
	Pressure-Operated Instruments
	Pitot/Static Heads Temperature Measurement Airspeed Indictor The Barometric Altimeter The Vertical Speed Indicator
	Gyroscopic Instruments
	Gyroscopes Turn & Slip Indicator The Direction Indicator The Artificial Horizon
	The Magnetic Compass
	Construction Principles of Operation Magnetic Variation Deviation Magnetic Dip Compass Errors

Advanced Flying Training Ground School Phase Overview	
Radio Navigation	**Radio Propagation Theory & Radar**
	Electricity and Magnetism Radar Range of Radar Sets Primary Surveillance Radar (PSR) Secondary Surveillance Radar (SSR) Uses of Radar Radar Vectoring Surveillance Radar Approach (SRA)
	Distance Measuring Equipment (DME)
	Principles of Operation Cockpit Equipment Position Fixing with DME
	Non-Directional Beacons (NDBs) & the Automatic Direction Finder (ADF)
	Use in Flight The NDB The ADF ADF Cockpit Displays Relative Bearing Orientation using the RBI The Rotatable-Card ADF Radio Magnetic Indicator (RMI) Intercepting an Inbound Track Intercepting an Outbound Track Maintaining Track Tracking Overhead Tracking Outbound NDB Approaches
	Very High Frequency Omnidirectional Range (VOR)
	Principles of Operation VOR Radials VORs on Charts VOR Cockpit Equipment Orientation and Position Fixing VOR Tracking Different VOR Presentations VOR Approaches
	Instrument Landing System (ILS)
	The Localizer The Glide Slope Marker Beacons Flying an ILS Approach Planning and Charts Decision Height
	Area Navigation (RNAV) & Global Positioning System (GPS)
	RNAV Requirements RNAV Waypoints GPS Fundamentals GPS Principles of Operation RAIM Augmentation Systems GPS Cockpit Equipment

Advanced Flying Training Ground School Phase Overview	
Human Performance	**Human Factors Introduction**
	Safety Culture Threat and Error Management Incident Reporting
	Aviation Visual Illusions
	Illusions whilst Taxiing Illusions on Takeoff Illusions in the Cruise Approach and Landing Scanning for Traffic Other Illusions Overcoming Illusions
	Situational Awareness & Attention
	Elements of Situational Awareness Levels of Situational Awareness Gathering Data Building Understanding Thinking Ahead Losing Situational Awareness Improving Situational Awareness
Flight Performance & Planning	**IFR Flight Planning**
	Weather & Minima NOTAMs & FCNs Routing Navigation Log Vertical Navigation Lateral Navigation Contingencies Fuel
Instrument Procedures	**Instrument Departures**
	Setting Course Standard Instrument Departures En-route Charts
	Holding & Manoeuvring
	Tracking in Holding Patterns Wind Corrections in Holding Patterns Joining a Holding Pattern Procedure Turns
	Instrument Approaches
	Vertical Navigation Segments of an Instrument Approach Precision & Non Precision Approaches Minima Missed Approach Segment
	Instrument Approach Charts
	Elements of IACs Plan View Profile View Obstacle Clearance Section

Advanced Flying Training Ground School Phase Overview	
Instrument Procedures	**Instrument Minima**
	En-route Minima Landing Minima Precision Approaches Non-Precision Approaches Obstacle Clearance Height System Minima Calculating DH/MDH Published Minima
	Visual Manoeuvring (Circling)
	The Visual Manoeuvring Area The Visual Circling Manoeuvre Descent below Visual Manoeuvring Height Missed Approach when Circling

1.3 Multi Engine Conversion Phase

1.3.1 Standard Multi-Engine Conversion Course Overview

Detail	Exercise	Time
F1	Initial Type Conversion	1:30
F2	General Handling and Circuits	1:30
F3	Introduction to Asymmetric Flight	1:30
F4	Critical and Safety Speeds	1:30
F5	Asymmetric Circuits	1:30
F6	Asymmetric Performance and Circuit	1:30
F7	MEP Class Rating Check	2:30

1.3.2 Introduction to Multi-Engine Conversion Course

The Multi-Engine Conversion Course has been designed with seven flight training details of 1:30 hours. The course is based on the CAA recommended MEP course.

1.3.2.1 Philosophy of the Course

The course contains all the elements of the CAA MEP course and is designed to ensure the trainee has the proficiency in operating and handling the Beech Baron 58 in both normal and asymmetric flight required in order to progress to the Instrument Flying phase of the course.

The details start with basic handling skills and then use building blocks to train and assess those new skills necessary to transition to a multi-engine aircraft. Asymmetric handling commences in detail 3 where basic handling skills are taught and continues throughout the remaining details.

Documentation is provided to aid self-study throughout the course, and if clarification is required this should be raised with the instructor. All manuals including the POH, Weight and Balance sheet and other course documentation is provided within the Course Documents and Resources folder, or linked from the relevant location within the lesson module. Other BAV documentation such as the Flying Order Book and SOPs are available from the main BAV website.

For the initial details the instructor will provide briefing material such as NOTAMs, weather and relevant performance information. As the details progress the trainee will be expected to gather this information, make any relevant calculations and make go/no go decisions where applicable. Having made such a decision based on the actual weather, the instructor may elect to adjust the in-sim weather in order to allow a detail to go ahead.

The intention is to conduct details online on VATSIM, treating the aircraft as ‘real’.

1.3.2.2 Notes for the Instructor

Each detail includes a lesson plan with general instructions and guidance about the items to be covered. In responding to trainees’ needs the instructor should manage the detail so as to maximise training value. Each trainee will approach the course from a different starting point dependent upon their FS and real-world experience, if any, and this must be

taken in to account. It is acceptable to combine multiple details in to a single session if the trainee is very able, however this must not be at the expense of standardisation or trainee understanding. Particular care should be taken during this phase of training as if the trainee's handling and aircraft management skills are not up to standard or concepts are poorly understood they will struggle when faced with the additional workload and complexity of the Instrument Flying phase.

After detail 3, instructors may introduce various simulated failures in accordance with the provided non-normal checklist. Failure management and handling should be assessed and input provided initially with the aim of improving the trainee's non-technical skills and single-pilot CRM. However, it should be noted that the AFT course is primarily a handling-focussed course and therefore the aim is simply to provide an introduction to such non-technical skills in preparation for jet orientation and type rating training which will follow.

It is vital that the instructor prepares for a detail by reading the previous Moodle report, talking to the previous trainer and establishing from the trainee him/herself how things are progressing and any areas of concern. The trainer should alert FTM whenever there is a concern over the motivation or progression of a trainee, for example if the trainee has 'no-showed' or cancelled a number of sessions at very short notice or if the trainee's handling skills are well below standard. With a trainee who has not graduated from the BAVirtual IFT course this could be a possibility and there is scope to arrange remedial details to resolve this.

Approaching details 5 and 6 the instructor should be considering the trainee's ability to successfully pass the MEP Check. Standard BAV Flight Training policy to only recommend trainees who are fully prepared for test applies. When all six training details and the MEP Theory Examination have been completed, and the instructor considers the trainee ready for the MEP Check, the instructor should notify FTM AFT in order to arrange the test.

1.3.3 Multi-Engine Conversion Flying Course

1.3.3.1 MEP Detail F1

1.3.3.1.1 Summary

Detail F1 Initial Type Conversion	
	Exercise
F1	Establish shared cockpit connection
	Aircraft familiarisation & pre-flight checks
	Taxi out
	Take off and route to training area
	Straight and level with speed changes
	Medium level, climbing and descending turns
	Slow flight
	Visual circuit join
	Landing
	Taxi in
	Post-flight action

1.3.3.1.2 Objectives

- Establish a successful shared cockpit connection
- Introduction of the Beech Baron 58 & complex aircraft
- Basic handling and characteristics
- Taxiing and takeoff
- Slow flight

1.3.3.1.3 Session Proficiency Criteria

- Safe & controlled taxiing
- Correct takeoff technique
- General handling adequate

1.3.3.1.4 Preview Item

None

Instructor Only

1.3.3.1.5 Detail F1 Session Guide

Aircraft Familiarisation

External view:

- Size: it's bigger (and heavier) than the Cessna 172 SP
- It has two engines – more power, to lift the extra mass
- The undercarriage (gear) is retractable – less drag in flight
- It can fly faster and higher with a heavier load
- The low wing is bigger, and so has larger fuel tanks inside
- It has a greater range – 1,530 nm vis-a-vis 635 nm for C172 SP

Internal View:

- It has similarities, but also differences, to a Cessna 172 SP
- The "basic six" flight instruments are in the same place
- There are now three control levers for each engine: throttle (black), pitch lever (blue) and mixture (red)
- Two sets of engine instruments – in new location
- There is an operating lever and lights for the retracting gear
- Now there are three flight control trim wheels – pitch, yaw and roll
- The IAS indicator has new markings – new reference speeds
- There are two magneto control switches – one per engine
- There are two fuel control valves –on floor between seat fronts
- The flap control switch is similar to the Cessna 172 SP
- The lights control panel is similar to the Cessna 172 SP
- The Master, Alternator and Avionics switches are also similar to the C172 SP
- The Park Brake lever is different to the Cessna 172 SP
- There is an emergency heated windscreen in case of icing

Air Exercise:

There now follows a short flight where the trainee will taxy the aircraft, take off and fly to the general handling area, practise and return to base, where he/she will carry out the approach and landing under guidance.

Before Start Check
Complete, with discussion and guidance

Engine Start Check
Complete, with discussion and guidance

After Start Check
Complete with discussion and guidance

Taxying Check
Complete with discussion and guidance. Carry out brakes check after aircraft has begun to move. Practise taxying, turning and stopping so that the trainee is competent in confined areas. Once competent, do instrument checks.

Before Take-Off Check

At engine run-up area complete the check with discussion and guidance. Note that there are now two engines, so there are two magneto switches – one for each engine. There is also the pitch control to be checked for the constant speed propellers.

After Take-Off Check

Complete when safely established in the climb. Rotation speed is 85 knots, accelerating to 50ft screen height speed of 100 knots. The gear, however, should be retracted without delay after the aircraft is safely climbing away from the runway – check that both the VSI shows a climb, and that the altimeter is increasing steadily. Flaps should be retracted once safely clear of all relevant obstacles and the speed allowed to increase to the Vy speed of 105 knots for best rate-of-climb.

General Handling

When at the general handling area allow the trainee to practise hand flying straight and level, accelerating and decelerating (noting the pitch trim change with power), medium turns, climbing and descending, without, then with, turns. Also practise slow flight with flap extension on schedule, and then practise gear extension. Again note any pitch trim changes in all cases so that they may be allowed for in the future.

Return to Airfield

When ready, return to base airfield for a trainee flown approach and landing, with guidance as necessary from the instructor, as before. Complete all necessary checks using the check-list, with guidance as necessary.

Discuss the strategy of approaching an airfield to land with regard to planning where Approach Checks should be completed, also when to select the gear down and the further strategy of flaps selection and speeds to fly. The Baron has a much larger speed range than the Cessna 172 and the higher cruising speed requires planning ahead to avoid a rushed approach. When in the circuit it is commonly recommended that the gear should be extended downwind, together with first position of flap. Additional flap and full flap set then takes place on final when the Landing Check is completed.

It is also initially recommended that the After Landing Check should be completed with the aircraft stationary when the runway has been safely vacated. With single pilot operations this prevents unwanted taxiway excursions.

1.3.3.1.6 Debrief

- Allow time for any questions
- Point trainee toward next lesson – General Handling and Circuits

Instructor Only

1.3.3.2 MEP Detail F2

1.3.3.2.1 Summary

Detail F2 General Handling & Circuits	
	Exercise
F2	Establish shared cockpit connection
	Pre-flight checks
	Taxi out
	Take off and route to training area
	Power handling
	General handling revision
	Visual circuit join
	Visual circuits
	Landing
	Taxi in
	Post-flight action

1.3.3.2.2 Objectives

- Introduction of correct power handling techniques
- Carry out circuit flying in a complex, retractable-gear aircraft

1.3.3.2.3 Session Proficiency Criteria

- Uses correct techniques for increasing and decreasing power
- Can fly circuits including touch and go, go around from low height and full stop landing, using correct techniques and procedures per POH and BAV SOP

1.3.3.2.4 Preview Item

None

1.3.3.2.5 Detail F2 Session Guide

- Repeat of the general flying as in Exercise 1. Emphasise the effect of the heavier mass of the aircraft (more stable platform; increased operating speeds). Continue until trainee is ready for circuit flying.

- Introduce correct power handling: remember the maxim for power changing during climbing and descending: **"Rev up – throttle down"**
    - When climbing increase the rpm by advancing the pitch control levers first, before increasing the power using the throttles.
    - When descending, throttle back first before adjusting the pitch control levers.

- This will prevent over-boosting, and thus over-stressing, the engine

- Return to base airfield and introduce varied circuit flying. Include full-stop landings, go-arounds and touch-and-go landings as required and as time permits. Brief on touch-and-go landings that the instructor will retract the flaps as trainee increases power to take-off.

- Take-off rotation speed is 85 knots, accelerating to 50ft screen height speed of 100 knots. The gear, however, should be retracted without delay after the aircraft is safely climbing away from the runway – check that both the VSI shows a climb, and that the altimeter is increasing steadily. Flaps should be retracted once safely clear of all relevant obstacles and the speed allowed to increase to the V_Y speed of 105 knots for best rate-of-climb.

- When doing circuits it is highly recommended that the undercarriage (landing gear) is selected down on the downwind leg and flaps set to 150 in timely preparation for the final approach. This is to avoid rushing the checks at a late stage. Emphasise the importance of checking the "3 greens" of the landing gear as confirmation that it is down and locked.

It should be possible to complete a minimum of 3 circuits.

1.3.3.2.6 Debrief

- Allow time to answer any questions.
- Point towards next lesson – introduction to asymmetric flight.
    - What problems might be associated with the failure of an engine?
    - What tools are available to the pilot to deal with these problems?
    - Is there any difference between the engines in terms of an engine failure?
- The trainee must memorise the important engine inoperative speeds prior to the next flying detail

Instructor Only

1.3.3.3 MEP Detail F3

1.3.3.3.1 Summary

Detail F3 Introduction to Asymmetric Flight	
	Exercise
F3	Establish shared cockpit connection
	Pre-flight checks
	Taxi out
	Take off and route to training area
	Simulated asymmetric power
	Asymmetric handling
	Visual circuit join
	Landing (AEO)
	Taxi in
	Post-flight action

1.3.3.3.2 Objectives

- Introduce zero thrust
- Introduce asymmetric handling and engine failure recognition
- Practice engine failure drills

1.3.3.3.3 Session Proficiency Criteria

- Uses rudder correctly to counter effects of engine failure
- Carries out controlled turns, climbs, descents and combinations thereof in an asymmetric condition
- Knows the values of V_{XSE}, V_{YSE}, en-route single-engine climb speed, single-engine manoeuvring to final approach speed and single-engine final approach speed

1.3.3.3.4 Preview Item

None

1.3.3.3.5 Detail F3 Session Guide

Remind/test the trainee regarding the important engine inoperative speeds:

- Best angle of climb speed, single engine: V_{XSE} = 95 knots
- Best rate of climb, single engine: V_{YSE} = 100 knots
- En-route climb, single engine: 100 knots
- Manoeuvring to final approach, single engine: 107 knots
- Final approach speed, single engine: 95 knots

Fly to the general flying area and level off at 2,500 ft.

Initially simulate the failure of an engine by retarding the pitch control to the feather detent, and then set 12" manifold pressure. This will approximate Zero Thrust when using the one-engine inoperative climb speed of 100 knots. Using this procedure avoids the difficulties sometimes experienced when trying to start an engine that has been shut down.

Remind the trainee that the application of rudder to counter the resulting yaw should be applied smoothly and expeditiously, but NOT slammed on. Only sufficient rudder to counter the yaw should be applied – too much rudder will cause a yaw in the opposite direction. History has shown that this secondary yaw has caused doubt as to which engine has failed, with disastrous results.

Practise general handling with the engine simulated failed. Include turns and climbs and descents, and combinations thereof. This readies the trainee for single engine approaches and landings.

When ready, restore power on the "failed" engine. Then practise simulated fails of either engine to practise failure recognition, as well as habituating the correct rate of application of rudder to counter the yaw.

Next restore the power and resume straight and level flight. Practise engine failure drills using "touch drills" and commentary by the trainee. Remind the trainee of the maxim:

"Dead foot = dead engine"

Remind the trainee that another check is to initially retard the throttle on the engine believed to have failed. If there is no yaw then the correct engine has been identified. HOWEVER – this check will not apply in a descent with the engines set at idle power.

ALSO – when at low altitude and/or low airspeed, this check must be carried out with EXTREME CAUTION as closing the throttle on the live engine could be disastrous!

Again, get the trainee to note the power setting when fully established on final approach in the landing configuration. Explain why these are good 'numbers' to know (pitot tube blocked and/or IAS indications suspect or broken). Becoming familiar with the engine sounds at this stage of flight can also be useful.

When ready, restore power to both engines operating and return to base airfield for a visual approach to full-stop landing.

Instructor Only

Instructor Only

1.3.3.3.6 Debrief

Point towards next lesson – minimum control and safety speeds

- Think about how rudder was used in this exercise
- What factors affected the amount of rudder needed to stop the yaw?

1.3.3.4 MEP Detail F4

1.3.3.4.1 Summary

Detail F4 Critical and Safety Speeds	
	Exercise
F4	Establish shared cockpit connection
	Pre-flight checks
	Taxi out
	Take off and route to training area
	Revise engine failure
	V_{MCA} Demonstration
	Engine failure in cruise
	Single-engine handling
	Visual circuit join
	Asymmetric circuit, go around & landing
	Taxi in
	Post-flight action
	Disconnect VATSIM
	Engine failure & RTO
	Full EFATO drill

1.3.3.4.2 Objectives

- Investigate the significance of critical speeds and takeoff safety speed
- Practice handling engine failures in-flight and during takeoff

1.3.3.4.3 Session Proficiency Criteria

- Correctly handles engine failures in flight and during takeoff
- Carries out correct feathering and unfeathering drills independently
- Can safely perform V_{MCA} demonstration and recover

1.3.3.4.4 Preview Item

Asymmetric circuit, go-around and landing (demonstrated by instructor)

Instructor Only

1.3.3.4.5 Detail F4 Session Guide

Revise engine failure handling:

- Control
- Identification
- Drills

V_{MCA} demonstration (note manoeuvre must be completed not below 3000 ft AGL):

- Establish aircraft in takeoff configuration:
  - Cowl flaps open
  - Gear **UP**
  - Props full fine
  - Mixtures set for takeoff
- Reduce power & trim for V_{YSE}

- Enter manoeuvre:
  - Reduce power on critical (left) engine to idle
  - **Slowly** increase power on operating (right) engine to takeoff power
  - Reduce airspeed by 1 kt/sec by pitching up whilst maintaining heading

- Recovery:
  - At **first indication of stall <u>OR</u> loss of directional control:**
    - Reduce power on operating (right) engine
    - Reduce AoA
  - As airspeed approaches V_{YSE}
    - Increase power on operating (right) engine
  - Once climbing away at V_{YSE}:
    - Increase power on critical engine
    - Clean aircraft up
    - Resume normal cruise

Demonstrate effect of different configurations on V_{MCA}:

- Wings level method – windmilling engine
- Angle of Bank method – windmilling engine
- Angle of Bank method – zero thrust/feathered

Engine failure during cruise:

- Practice feathering and unfeathering drills
- Practice single-engine handling including climbs, turns and descents

Single-engine return to airfield for visual circuit join

- Instructor demonstrate asymmetric circuit, go-around and landing

Complete taxi-in and post flight drills, then **disconnect from VATSIM**.

Instructor Demonstrate and trainee practice handling engine failures during takeoff:

- On ground/below TOSS (RTO)
- At or above TOSS

- Full EFATO drill

Engine failure during ground roll:

This requires keeping the aircraft straight on the runway using rudder as required. Both throttles are rapidly closed with simultaneous application of maximum braking.

Staying on the paved surface ensures the wheel brakes can be used at maximum efficiency. However this can be seriously impaired if one or both of the wheel brakes are locked and the wheel(s) skid(s).

Once stopped, if possible and safety is not an issue, the runway should be vacated. Liaison with ATC can be of great assistance. Unnecessary closure of the runway should be avoided. Only after this decision has been made should the shutdown checks be effected.

Practise engine failures prior to getting airborne until competent.

Engine failure once airborne:

This situation requires an immediate decision: can the flight be safely continued? If sufficient runway length remains, it might be considered better to close the throttles and land ahead. The existence of obstacles in the take-off path may also suggest that a landing straight ahead would be the safer option.

If continuing with the flight is chosen, then the memory items of the engine failure checks should be carried out carefully, but expeditiously, from memory. Reference to the check-list (open at this check-list and within secure reach of the pilot on every take-off!) should only be made when safely clear of the ground and any obstacles. Only then should the failed engine be secured.

The memory items are:

- Landing gear and flaps ……. UP
- Throttle (inop engine) ……..…… Closed
- Propeller Pitch Control ……... Feather
- Power (operative engine) …… As req'd
- Climb Speed ……... 100 kts

Initially simulate the failure of an engine by retarding the pitch control to the feather detent, and then set 12" manifold pressure. This will approximate Zero Thrust when using the one-engine inoperative climb speed of 100 knots. Using this procedure avoids the difficulties sometimes experienced when trying to start an engine that has been shut down.

Remind the student that the application of rudder to counter the resulting yaw should be applied smoothly and expeditiously, but **NOT** slammed on. Only sufficient rudder to counter the yaw should be applied – too much rudder will cause a yaw in the opposite direction. History has shown that this secondary yaw has caused doubt as to which engine has failed, with disastrous results.

1.3.3.4.6 Debrief

Point towards next lesson – asymmetric circuits

Instructor Only

1.3.3.5 MEP Detail F5

1.3.3.5.1 Summary

Detail F5 Asymmetric Circuits	
	Exercise
F5	Establish shared cockpit connection
	Pre-flight checks
	Taxi out
	Engine failure after takeoff
	Asymmetric circuit
	Go around
	Asymmetric circuit
	Landing
	Taxi in
	Post-flight action

1.3.3.5.2 Objectives

- Complete EFATO drills
- Carry out an asymmetric circuit, go-around and landing
- Explore the concept of Asymmetric Committal Height

1.3.3.5.3 Session Proficiency Criteria

- Can correctly handle an engine failure of the critical engine after takeoff
- Correctly completes EFATO & feathering drills
- Safely completes an asymmetric circuit, approach, go-around and landing within the flight test tolerances

1.3.3.5.4 Preview Item

None

1.3.3.5.5 Detail F5 Session Guide

Revise take-off safety brief

- Actions in event of engine failure:
  - Prior to liftoff/TOSS
  - At or above TOSS

Take-off with EFATO

- All actions must be completed accurately and promptly, with control of the aircraft maintained throughout
- Ensure proper identification (dead foot – dead engine)

Downwind:

- Power setting will be higher than normal
- Consider what speeds to use
- Undercarriage/flap extension – when and how much? Consider additional drag vs reduced power available
  - Delay gear until descending on base leg
  - Delay full flap until landing assured
  - Adjust checks as appropriate (i.e. downwind – hold at undercarriage)

Final:

- Asymmetric Committal Height
- Consider go-around decision – what would cause us to go around?
  - Would have to be very significant!
- Go-around actions:
  - Flap one stage up
  - Wait for positive rate before retracting gear
  - Safe height/safe airspeed – flaps up
- Foot loads – be ready to counter the yaw as power is increased

Landing:

- Rudder usage – amount of pressure required will change as power is reduced in flare

Taxi in:

- Ground handling – will be slightly more tricky with one engine inoperative

1.3.3.6 Debrief

Point towards next lesson – asymmetric performance and circuit. Think about what further effects were seen when the engine failed – e.g. on aircraft systems etc. What sort of things might we need to consider if we were to experience an engine failure en-route?

Instructor Only

1.3.3.7 MEP Detail F6

1.3.3.7.1 Summary

Detail F6 Asymmetric Performance and Circuit	
	Exercise
F6	Establish shared cockpit connection
	Pre-flight checks
	Taxi out
	Take off and route to training area
	Engine failure
	Explore effect on systems
	Explore effect on performance
	Visual circuit join
	Asymmetric circuits
	Landing
	Taxi in
	Post-flight action

1.3.3.7.2 Objectives

- Explore the effects of engine failure on in-flight performance
- Explore the effects of engine failure on aircraft systems
- Practice asymmetric circuits

1.3.3.7.3 Session Proficiency Criteria

- Can state the effect of asymmetric operation on aircraft systems and performance
- Can consistently complete asymmetric circuits within the flight test tolerances

1.3.3.7.4 Preview Item

None

Instructor Only

1.3.3.7.5 Detail F6 Session Guide

Remind/test the trainee on the content of the long brief. What impact can we expect from an engine failure?

- Range?
- Endurance?
- Climb performance?
- Speeds?
- Systems?

Take off and route to training area. En-route, fail an engine. Review and demonstrate the effects on aircraft systems, including:

- Engine parameters
- Electrical system operation
- Fuel system (crossfeed)

Review and demonstrate effect on aircraft performance:

- Effect of feathered vs unfeathered
- Effect of using different speeds on climb/cruise performance etc
- Effect on range and endurance

Return for visual circuit join and asymmetric circuits until proficient.

1.3.3.7.6 Debrief

This is the final detail before the MEP Class Rating Check. Point towards the check and build up the trainee's confidence as required. If further practice of certain items is required, discuss this with the trainee and arrange further details as necessary.

Advise the trainee that you will be contacting FTM in order to arrange the check, and that the examiner will be in touch to arrange a suitable date and time.

1.3.3.8 MEP Class Rating Check

1.3.3.8.1 Summary

MEP Class Rating Check	
	Exercise
MEP	Establish shared cockpit connection
	MEP Class Rating Check

1.3.3.8.2 Objectives

- Check the candidate's proficiency in operating a multi-engine piston aircraft

1.3.3.8.3 Session Proficiency Criteria

- Completes all sections of the MEP Class Rating Check to a satisfactory standard and within flight test limits

1.3.3.8.4 Session Guide

Section 1 - Departure

Pre-flight

- Check aeroplane serviceability
- Check that all documents required for the flight are carried and correct
- Obtain and assess all elements of the prevailing and forecast weather conditions
- Complete mass and balance schedule and establish performance criteria
- Check NOTAM for factors likely to affect conduct of flight
- Complete an appropriate flight navigation log, chart and flight plan
- Complete fuel plan and determine that the aeroplane is correctly fuelled for the flight

Pre-Start Checks

- Complete all elements of the aeroplane and equipment pre-flight inspections as detailed in checklist, operating handbook or flight manual
- Complete an appropriate passenger emergency procedure briefing

Engine Starting

- Complete engine starting procedures in accordance with the approved checklist, operating handbook or flight manual

Taxiing

- Complete all recommended taxying checks and procedures
- Comply with ATC instructions, airport markings and signals
- Maintain control and proper spacing from other aircraft and obstacles

Pre-Departure Checks

- Ensure all systems are operating normally or, if not, that the aircraft is fit for departure in accordance with a minimum equipment list or an equivalent

- Ensure the aircraft is correctly configured for departure
- Complete all departure checks and drills including engine operation
- Obtain and comply with ATC departure clearance

Take-off Procedure

- Confirm any aeroplane performance criteria including crosswind condition
- Position the aeroplane correctly for take-off and advance the throttle(s)/thrust lever(s) to take off power with appropriate checks
- Use the correct take-off technique using the recommended speeds for rotation/lift-off and initial climb
- Ensure a safe climb and departure adjusting power and aeroplane configuration as appropriate
- Complete all necessary after take-off checks
- Execute a safe departure in accordance with clearance and with due regard for other air traffic

Climbing

- Achieve target speeds and headings
- Comply with ATC instructions
- Use correct and effective lookout techniques
- Complete all necessary climb checks

ATC Liaison - compliance RTF procedures, Airmanship

- Demonstrate standard RTF procedures and phraseology
- Demonstrate compliance with ATC instructions
- Operate on the ground and in the air with particular regard for passenger safety and comfort

Section 2 – Airwork (VMC)

Straight and level flight

- Demonstrate control by visual attitude whilst maintaining a correct and effective lookout technique
- Demonstrate correct techniques for visual flight manoeuvring within the specified limits
- Maintain balance and trim

Slow Flight

- Consider all safety checks before the manoeuvres where necessary
- Select and stabilise the aeroplane at a nominated low airspeed above the stall speed whilst maintaining balance, trim and lookout. Maintain specified altitude/level, heading and speed as specified by the examiner
- Maintain safe bank angles, balance, speed, and altitude (if required) during turning and complete turns onto specified headings

Steep Turns (360° left and right - 45 °AOB)

- Ensure a thorough lookout to clear the airspace, before, during and after the turns

- Roll into a co-ordinated turn with a bank angle of not less than 45°; maintain a stable, balanced turn through at least 360°
- Establish and maintain bank angle, speed and height by using smooth, co-ordinated control inputs
- Roll out of the turn and stabilise straight and level flight on a specified heading

Stalls and Recovery

- Conduct appropriate safety checks before stalling
- Establish the required aeroplane configuration and stall entry as appropriate from straight & level or manoeuvring flight
- Maintain heading (or bank angle 10°-30° as required) to stall entry
- Recognise the symptoms of the stall or approaching stall and initiate the correct recovery action
- Recover, using the correct techniques and with minimum height loss to return to a clean configuration best rate climb, or as otherwise directed by the examiner
- Complete all necessary checks and drills
- Maintain effective lookout throughout

Handling using Autopilot & Flight Director (May be conducted in Section 3)

- Demonstrate correct procedure for pre-flight functional check of autopilot and/or flight director
- Demonstrate correct operating procedure for autopilot and/or flight director in all modes
- ATC Liaison
- Obtain and maintain suitable level of service from ATC
- Maintain listening watch and respond appropriately to messages/instructions/clearances from ATC

Section 3 - En-Route (VFR)

The exact content and duration of section 3 is at the discretion of the examiner. As a minimum it should comprise one route sector or navigation leg, sufficient for the applicant to demonstrate proficiency in en-route VFR procedures. Note that this is not intended to replicate the en-route section of an initial P3 skill test, thus a flight time in the cruise of approximately 15 - 30 minutes (not more than 45) is envisaged for this section.

Flight Plan

- If submitted, the flight plan and clearance is to be completed correctly and clearances complied with.

Maintenance of altitude, heading and speed

- Control aeroplane using visual attitude flying techniques
- Configure airframe and engine(s) for cruise or endurance performance in accordance with approved checklist and/or Flight or Operations Manual
- Maintain the heading, height and speed as computed in navigation log or advised to the examiner within the prescribed limits
- Adjust and monitor fuel consumption for range or endurance as appropriate

Orientation and timing, revision of ETAs

- Identify position visually by reference to ground features and map
- Navigate by means of calculated headings, ground speed and time
- Achieve destinations or turning points within 3 minutes of estimated time of arrival (ETA)
- Calculate heading, ground speed, ETA and fuel required during any unscheduled diversion
- Amend plan to avoid deteriorating weather and maintain VMC, or consider discontinuing navigation route if unable to maintain VMC

Use of radio aids and/or GPS

- Select, identify and interpret position/navigation information from appropriate ground based radio and navigation aids or from GPS information as required or nominated by examiner
- Navigate to designated waypoints (VFR) using the navigation aids nominated by the examiner
- Maintain the heading, height and speed within the prescribed limits

Flight Management

- Complete all elements of VFR planning for the route prescribed with particular reference to planned tracks, altitudes and safe levels of operation
- Maintain a navigation log and radio log by recording sufficient information such that the route may be reconstructed if necessary after flight
- Monitor the engine and aircraft systems throughout the flight
- Monitor fuel consumption versus fuel available and fuel required throughput the flight

ATC liaison/ compliance, R/T procedures, Airmanship

- Set and cross check altimeters to most appropriate pressure setting in accordance with national regulations or as required by checklist, operations manual or ATC
- Use correct and standard RTF phraseology throughout
- Where appropriate, obtain ATC clearances and appropriate level of service
- Where required, comply with ATC clearances and instructions
- Display sound airmanship, flight management and decision-making
- Complete all necessary checks and drills

Section 4 - Arrivals and Landing Procedures

Arrival procedures

- Carry out appropriate checks and drills
- Set altimeters and cross check in accordance with checklist, Operations Manual, or as required
- Comply with published arrival procedure or clearance
- Maintain adequate lookout and collision avoidance

Normal Landing

- Consider weather and wind conditions, landing surface and obstructions
- Plan and follow the circuit pattern and orientation with the landing area
- From the circuit pattern establish the recommended approach configuration and adjust speed and rate of descent to maintain a stabilised approach

- Select and achieve the appropriate touchdown area at the recommended speed
- Adjust descent and round out (flare) to achieve a safe landing with little or no float with appropriate drift and crosswind correction
- Maintain directional control after touchdown and apply brakes for a safe roll out
- Complete all necessary checks and drills

Flapless Landing

As for Normal landing plus:

- Consideration for changed aircraft performance
- Adjustment in final approach slope if appropriate for type for reduced drag
- Ascertain and achieve a planned landing position

Crosswind Landing

- As for normal landing plus:
- Utilises appropriate technique to minimise drift and excessive lateral loads on the undercarriage on landing

Go around from minimum height

- Execute a timely decision to go around, or when instructed by ATC or when instructed by the examiner (this may be at any height or time prior to touchdown)
- Apply appropriate power and control aeroplane attitude to initiate a safe climb maintaining balance and heading
- Adjust configuration and speed to achieve a positive climb at Vy or Vx as appropriate
- Maintain go-around power until a safe manoeuvring altitude is reached and then adjust to a normal climb configuration and speed
- Complete all necessary checks and drills

ATC liaison and compliance, RTF procedure, Airmanship

- Obtain and comply with ATC clearances using correct RTF phraseology
- Adjust circuit pattern/speed to maintain spacing with other traffic in the landing pattern
- Maintain awareness of other traffic through RTF and lookout

Section 5 - Abnormal and Emergency Procedures

Rejected take-off

- Recognise a situation where the safest course of action is to reject the take-off
- Take appropriate actions to stop safely within the remaining runway; inform ATC
- Consider and demonstrate/discuss appropriate actions following RTO (e.g. engine shut down, evacuation, precautions for hot brakes etc)

Simulated emergencies (any emergency, abnormal procedure or system failure that is appropriate to the aeroplane on which the test is conducted)

- Correctly diagnose the problem
- Consider options and decide upon a sound course of action
- With reference to checklist, execute appropriate abnormal or emergency procedures

- Review, plan and execute further actions as appropriate to ensure safe recovery of aeroplane, passengers and crew

Engine shutdown and restart

- With reference to checklist, execute correct procedures for pre-meditated engine shutdown and subsequent re-start
- Maintain control of aircraft throughout including heading, balance and trim
- Effect drills correctly and without assistance

ATC liaison: compliance, RTF procedures, Airmanship

- Make appropriate emergency RTF calls informing ATC of situation and assistance required (transmissions prefixed with “practise” or “simulated” or given to examiner but not transmitted)
- Analyse emergency or abnormal situation in calm, methodical fashion
- Make sound decisions regarding checks/procedures and formulate appropriate plan for subsequent conduct of flight
- Use checklist to confirm actions when time permits

Section 6 - Simulated Asymmetric Flight

Items from this section may be performed in Sections 1 to 5.

Simulated engine failure after take-off (at a safe speed and altitude)

Simulated engine failure in aeroplanes must only be simulated only after the aeroplane has achieved at least take-off safety speed and a safe altitude

- Maintain directional control following simulated engine failure
- Correctly identify failed engine; confirm failed engine and complete the published checks and drills
- Maintain the correct speed, configuration and trim for optimum performance
- Comply with ATC instructions

Asymmetric approach and go around

- Maintain a stable (trimmed) approach in the correct configuration
- Make a clear decision to land or go-around no later than the appropriate committal height
- Complete asymmetric approach and go-around into visual circuit, circling approach or further instrument approach, maintaining control and correct speeds
- Reconfigure and trim aircraft correctly
- Complete after take off/go around checks

Asymmetric approach and full stop landing

- Consider the actual weather and wind conditions, landing surface and obstructions
- Maintain a stable (trimmed) approach in the correct configuration
- Plan and follow suitable approach pattern and orientation with the landing runway
- Establish the correct approach configuration, adjusting speed and rate of descent to maintain a stabilised approach path
- Make a clear decision to land or go-around no later than the appropriate committal height

- Select and achieve the appropriate touchdown area at the required speed
- Adjust descent and round out (flare) to achieve a safe landing with little or no float with appropriate drift and crosswind correction
- Maintain control and apply aeroplane brakes for a safe roll out
- Complete necessary checks and drills

ATC Liaison, compliance, RTF procedures, Airmanship

- Inform ATC of abnormal flight condition and any assistance required
- Comply with ATC procedures and instructions
- Adjust traffic pattern with due regard to weather, surface conditions, obstructions and other air traffic
- Adjust configuration and circuit pattern with regard to aeroplane performance
- Complete necessary checks and drills

1.3.3.8.5 Flight Test Tolerances

Although tests or checks may specify flight test tolerances, a candidate should not be expected to achieve these at the expense of smoothness or stable flight. An examiner should make due allowance for unavoidable deviations due to turbulence, ATC instructions and the handling qualities and performance of the type of aircraft used. Candidates may be advised that, during the flight, they should concern themselves only with flying and operating the aircraft to the best of their ability and not attempt to remain within the tolerances to the detriment of smooth handling. However, it is BAVirtual Flight Training policy to use these test tolerances when preparing candidates for test.

Profile	**Tolerance**
Normal Flight	±100ft
With simulated engine failure (ME)	±150ft
Limited or partial panel	*±200ft*
Starting go-around at decision alt/ht	+50ft/-0ft
Minimum descent altitude/height	+50ft/-0ft
'Not below' minima (from FAF altitude down to MDA/H)	*-0ft*
Circling minima	*+100ft/-0ft*
Asymmetric committal height/altitude	*-0ft*

At all times when using a single-needle display	±5°
At all times when using a deviation bar display	Half scale deflection azimuth and glidepath (precision approach)
DME arcing	*±1nm*

All engines operating	±5°
With simulated engine failure (ME)	±10°
Limited or partial panel	*±15°*

Take-off and approach	±5kt
All other flight regimes	±5kt
Limited or partial panel	*±10kt*
With simulated engine failure	+10/-5kt

Notes:

- Entries in italics are suggested tolerances

1.4 Instrument Flying Phase

1.4.1 Standard Instrument Flying Course Overview

Detail	Exercise	Time
F7	Instrument Flying Introduction	1:30
F8	Limited Panel Introduction	1:30
F9	NDB Tracking	1:30
F10	NDB Holds	1:30
F11	VOR Tracking	1:30
F12	VOR Holds	1:30
F13	Radar Circuits	1:30
F14	Procedural Approaches	1:30
F15	Unusual Attitudes	1:30
F16	Instrument Stalling	1:30
F17	Asymmetric Radar Circuits	1:30
F18	Asymmetric Procedural Approaches	1:30
F19	IFR Cross Country 1	2:45
F20	IFR Cross Country 2	2:45
F21	IR Skill Test	2:30

1.4.2 Introduction to Instrument Flying Course

The Instrument Flying Course is designed with 14 Flight Training details of 1:30 hours, including approximately 10-15 minutes briefing, 1 hour flight time and 10-15 minutes debriefing. Detail 15 is the IR Skill Test and 2:30 hours is allocated for this, including 10-15 minutes briefing and 10-15 minutes debriefing.

1.4.2.1 Philosophy of the Course

The course contains all elements of the VATSIM P5 rating syllabus. These are the skills and knowledge items which the trainee needs to demonstrate having achieved at a satisfactory standard for the issue of the VATSIM P5 rating.

The details start with an introduction to basic instrument flying theory and the concept of limited panel operations. These concepts are then put in to practice as the course progresses with further details introducing beacon tracking, holding and instrument approach procedures. Each skill will be practiced on both the full and limited panel. Upset prevention and recovery is introduced in detail 16, and asymmetric work will feature regularly also.

Documentation including the POH, Weight and Balance form, checklists and reference study material is made available via the E-Learning Centre in the Course Documents and Resources folder, or linked within the Long Briefing e-learning modules. Trainees should also ensure they have the latest version of the BAVirtual Flying Club Flying Orders and BAVirtual SOPs from the main BAVirtual website.

Charts from the UK AIP will be used and trainees must ensure they can access the UK AIP website. Retrieving the relevant charts should form part of the trainee's preparation for each detail. SkyVector enroute charts will be used and trainees should familiarise themselves with how to operate the SkyVector website.

For local flying no formal navigation log or weight and balance form will normally be necessary as at typical training weights and loads the aircraft will comfortably meet all performance requirements ex-LPL. However, trainees are expected to retrieve weather and NOTAM information and brief as appropriate. For the IFR route flights trainees will be required to prepare a navigation log, weight and balance and performance calculation and make an appropriate go/no go decision based on the current and forecast actual weather. Instructors may subsequently elect to modify the in-sim weather in order to enable the detail to go ahead. Blank weight and balance forms and navigation logs are available from the Course Documents and Resources folder.

1.4.2.2 Notes for the Instructor

The lesson plans provided give general instructions and guidance about the items required to be covered in the detail. However, instructors will need to manage the detail in order to respond to trainees' needs and maximise training value.

Each trainee will have varying levels of FS and perhaps real-world experience and therefore it will be necessary to adapt as appropriate. It is acceptable to combine multiple details in to a single session if a trainee is making good progress, but this must not be done at the expense of standardisation or understanding of the content.

With the exception of asymmetric handling, failure management other than instrument failure (limited panel) is not a primary aim of the course and therefore instructors should not introduce simulated failures outside of those contained within the lesson plan.

It is vital that the instructor prepares for a detail by reading the previous Moodle report, talking to the previous trainer and establishing from the trainee him/herself how things are progressing and any areas of concern. The trainer should alert FTM whenever there is a concern over the motivation or progression of a trainee, for example if the trainee has 'no-showed' or cancelled a number of sessions at very short notice or if the trainee's handling skills are well below standard. Although all trainees commencing the Instrument Flying phase should have already passed the MEP check, it is possible trainees with weaker handling skills will struggle with the additional workload of instrument flying and remedial details will be arranged if necessary.

Approaching details 13 and 14 the instructor should be considering the trainee's ability to successfully pass the IR Skill Test. Standard BAV Flight Training policy to only recommend trainees who are fully prepared for test applies. When all 14 training details have been completed and the instructor considers the trainee ready for the IR Skill Test, the instructor should notify FTM AFT in order to arrange the test.

1.4.3 Instrument Flying Course

1.4.3.1 IF Detail F7

1.4.3.1.1 Summary

Detail F7 Instrument Flying Introduction	
	Exercise
F7	Establish Shared Cockpit Connection
	Pre-flight Checks
	Taxi Out
	Take Off and Route to Training Area
	General Instrument Handling
	Return for visual circuit join and landing
	Taxi In
	Parking

1.4.3.1.2 Objectives

- Introduce flight without external visual references
- Introduce basic instrument scanning technique
- Conduct basic flight manoeuvres by sole reference to the instruments

1.4.3.1.3 Session Proficiency Criteria

- Can fly straight and level by sole reference to the instruments
- Can conduct straight climbs and descents by sole reference to the instruments
- Can fly medium level, climbing and descending turns by sole reference to the instruments

1.4.3.1.4 Preview Item

None

Instructor Only

1.4.3.1.5 Detail F7 Session Guide

Fly to be at general flying area at 3,000ft altitude.

Enroute to GFA remind student of VFR flying technique – the outside view is the prime reference. Flight instruments are used to 'fine tune' the attitude, altitude and speed.

Now there is no outside reference and the artificial horizon (Attitude Deviation Indicator - ADI) becomes the prime reference.

Remind student that a good scan technique is paramount. Always begin and end with the artificial horizon, but scan the other instruments of the 'basic six' frequently.

A typical scan would be:

- From the ADI scan the IAS – then back to the ADI.
- Scan the altimeter, then the VSI – then back to the ADI.
- Check the slip indicator – then back to the ADI.
- Repeat continuously but with longer looks at the ADI.

Proficiency at scanning comes with practice.

Begin with straight and level flight, and when ready introduce rate 1 banked turns. Show that the VSI is more sensitive than the altimeter in indicating a change of altitude.

Remind student that a small power increase may be necessary.

Now move on to climbs and descents. Remind student of correct power handling: the maxim for power changing during climbing and descending being:

"Rev up – throttle down"

When ready progress to climbing and descending turns, limit the bank angle to 15°.

When ready, return to airfield for a visual approach and full-stop landing.

1.4.3.1.6 Debrief

Allow time for any questions. Remind the trainee that instrument flying is demanding work requiring a high level of accuracy, and reassure them that a degree of over-controlling is quite normal in the early stages. This will improve with practice and as their scan rate and technique improves.

Point towards next detail: introduction to flying on the limited panel. Discuss what information is available on the panel and how the performance instruments may be used to infer information about the aircraft's attitude in the absence of the ADI: e.g. relationship between pitch attitude and airspeed/altitude/VSI, bank angle and turn co-ordinator/HSI/magnetic compass etc.

1.4.3.2 IF Detail F8

1.4.3.2.1 Summary

Detail F8 Limited Panel Introduction	
	Exercise
F8	Establish Shared Cockpit Connection
	Pre-flight Checks
	Taxi Out
	Take Off and Route to Training Area
	General Instrument Handling – Limited Panel
	Return for visual circuit join and landing
	Taxi In
	Parking

1.4.3.2.2 Objectives

- To introduce flight on the limited panel
- Carry out basic flying manoeuvres following the simulated failure of the vacuum system (loss of ADI and HSI)
- Introduce techniques for recognising instrument failure

1.4.3.2.3 Session Proficiency Criteria

- Can fly straight and level and carry out turns, climbs and descents by sole reference to the limited panel
- Knows how to recognise a failure of the main flight instruments and respond appropriately

1.4.3.2.4 Preview Item

None

Instructor Only

1.4.3.2.5 Detail F8 Session Guide

Take off and route to training area; set IMC weather conditions.

En-route practice straight & level flight and turns on the full panel. Recap instrument scanning technique.

Fail the ADI: demonstrate how the performance instruments can be used to determine aircraft attitude, direction and level. Show how cross-checking instruments can be used to identify an instrument failure (inverted V scan).

Trainee practices flying straight & level on limited panel.

Repeat with ADI & HSI failed (vacuum failure scenario)

Practice turns, climbs and descents using same failures.

Return to airfield for visual circuit join and landing.

1.4.3.2.6 Debrief

Highlight & reinforce positive points. Reassure trainee that there will be plenty of opportunities to practice flying and manoeuvring on the limited panel during the course – at this stage a basic understanding of the principles and handling is all that is expected.

1.4.3.3 IF Detail F9

1.4.3.3.1 Summary

Detail F9 NDB Tracking	
	Exercise
F9	Establish Shared Cockpit Connection
	Pre-flight Checks
	Taxi Out
	Take Off and Route to Training Area
	NDB Tracking
	Return for visual circuit join and landing
	Taxi In
	Parking

1.4.3.3.2 Objectives

- Introduce use of the NDB and ADF
- Introduce techniques for identifying a radio navigation aid
- Practice intercepting and tracking inbound and outbound from an NDB

1.4.3.3.3 Session Proficiency Criteria

- To correctly identify an NDB using the tune – identify - test technique
- To intercept and maintain a track to or from an NDB within ±5°

1.4.3.3.4 Preview Item

NDB Approach – look at how tracking to/from an NDB is used to perform an instrument approach

Instructor Only

1.4.3.3.5 Detail F9 Session Guide

Fly to be at general flying area at 3,000ft altitude in cloud.

En-route practise climbs, turns and descents.

When at the GFA tune in an NDB. Suitable NDBs located away from areas of controlled airspace include:

- Warton 337 WTN .-- - -.
- Blackpool 318 BPL _... .--. .-..

The Liverpool NDB (LPL 349) is also available but is situated on the EGGP 27 final approach, as well as lying in close proximity to the Manchester TMA.

Emphasise the checking of the correct Morse code identifier, and needle pointing in the expected direction. The following instruction applies equally to 'raw' VOR tracking (needle).

Tune – Identify - Test

Turn aircraft to point directly at NDB and note magnetic direction indicated on the gyro compass (HSI). This heading, the magnetic heading to maintain to fly directly to a beacon is called the QDM. Fly directly to the NDB and overfly and note needle reaction.

Once past the NDB fly for 5 minutes in a straight line. Turn right until the NDB needle again points straight ahead and note the new QDM. Note that this is NOT the reciprocal of the first QDM (check student knows how to calculate reciprocal directions), but, due to the lateral geographical movement of the turn, is the reciprocal of a larger QDM (turn right: flying away - QDM increases; when flying towards – QDM decreases. The converse also applies).

Once this has been noted, turn left about 150 so that the NDB needle is 150 to the right of the aircraft heading. Fly straight ahead so that the NDB needle moves round to the right. Show the student that it is as if the 'nose' of the aircraft is pushing the head of the needle away from it.

As the aircraft continues straight ahead, show the student that the 'tail' of the NDB needle moves continuously to its right and approaches the aircraft heading. It is as if the nose of the aircraft is 'pulling' the tail towards it.

These are important concepts to grasp and the instructor should ensure that the student fully understands what is happening. They form the basis on which tracking to and from an NDB (or raw VOR presentations) is effected.

Having flown past the NDB for about 8 minutes demonstrate to the student how to turn and track on the 090° QDM back to the NDB. Overfly and maintain the techniques of pushing the head, and/or pulling the tail, of the NDB as required.

Emphasise to the student that it is when the head/tail of the needle is on the desired QDM or its reciprocal that the correct track will be followed. In the present case there is no wind – but when there is a wind the concept remains the same, even though the actual heading to maintain the QDM will differ because of drift.

Now guide the student to fly selected QDM's to and from the NDB. It may take time for these concepts to be internalised, so patience is the watchword.

1.4.3.3.6 Debrief

Point towards next lesson – NDB holding. Ask trainee to think about how tracking was seen in this lesson and how it can be applied to a holding pattern. Also consider how wind will affect holding patterns and any pitfalls!

Instructor Only

1.4.3.4 IF Detail F10

1.4.3.4.1 Summary

Detail F10 NDB Holds	
	Exercise
F10	Establish Shared Cockpit Connection
	Pre-flight Checks
	Taxi Out
	Take Off and Route to Training Area
	Practice NDB tracking
	Hold entry procedures
	NDB holds
	Return for engine-out approach and landing
	Taxi In
	Parking

1.4.3.4.2 Objectives

- Introduce practical application of holding procedures using the NDB
- Hold entry, maintaining and exiting
- Explore the effects of wind on holding patterns

1.4.3.4.3 Session Proficiency Criteria

- Can enter an NDB holding pattern using the correct sector entry procedure
- Can use the ADF to maintain a hold applying appropriate wind corrections

1.4.3.4.4 Preview Item

NDB approach

1.4.3.4.5 Detail F10 Session Guide

Route to training area in IMC – track to a suitable NDB and practice

Demonstrate a direct entry in to a holding pattern & trainee practice

Repeat with other hold entries

For given hold, demonstrate the effect of wind and the need to apply wind corrections appropriately

If time allows, attempt standard entry in to holding pattern on limited panel

Recover to airfield for engine-out approach and landing

1.4.3.4.6 Debrief

Point ahead to next lesson – VOR tracking. Mention similarities and differences from the NDB/ADF.

Instructor Only

1.4.3.5 IF Detail F11

1.4.3.5.1 Summary

Detail F11 VOR Tracking	
	Exercise
F11	Establish Shared Cockpit Connection
	Pre-flight Checks
	Taxi Out
	Take Off and Route to Training Area
	General handling practice including Limited Panel
	VOR intercept & tracking using HSI
	VOR intercept & tracking using RMI
	Return for visual circuit, go-around and landing
	Taxi In
	Parking

1.4.3.5.2 Objectives

- Introduce use of the VOR
- Reinforce techniques for identifying a radio navigation aid
- Practice intercepting and tracking inbound and outbound from a VOR

1.4.3.5.3 Session Proficiency Criteria

- To correctly identify a VOR using the tune – identify - test - set technique
- To intercept and maintain a track to or from a VOR using the HSI within half scale CDI deflection

1.4.3.5.4 Preview Item

Holding if time available

1.4.3.5.5 Detail F11 Session Guide

Route to general flying area. Practice climbs, descents and turns, including limited panel.

Suitable VORs in the GFA

- Wallasey 114.1 WAL .-- .- .-..

Introduce use of the HSI to track to and from a VOR on various radials and how the DME can be used in conjunction for position fixing

Introduce use of two VORs together for tracking and position fixing

Demonstrate how the RMI can be used for tracking without the HSI

Return to airfield for go-around into visual circuit and landing

1.4.3.5.6 Debrief

Point towards next lesson – VOR holding. Ask trainee to think about how tracking was seen in this lesson and how it can be applied to a holding pattern. Also note differences between using ADF/RMI and CDI.

Instructor Only

1.4.3.6 IF Detail F12

1.4.3.6.1 Summary

Detail F12 VOR Holds	
	Exercise
F12	Establish Shared Cockpit Connection
	Pre-flight Checks
	Taxi Out
	Take Off and Route to Training Area
	Practice VOR tracking
	Hold entry procedures
	VOR holds
	Return for visual circuit join and landing
	Taxi In
	Parking

1.4.3.6.2 Objectives

- Introduce practical application of holding procedures using the VOR and HSI
- Hold entry, maintaining and exiting
- Explore the effects of wind on holding patterns

1.4.3.6.3 Session Proficiency Criteria

- Can enter an NDB holding pattern using the correct sector entry procedure
- Can use the ADF to maintain a hold applying appropriate wind corrections

1.4.3.6.4 Preview Item

ILS approach

1.4.3.6.5 Detail F12 Session Guide

Route to training area in IMC – track to a suitable VOR and practice

Demonstrate a direct entry in to a holding pattern & trainee practice

Repeat with other hold entries

For given hold, demonstrate the effect of wind and the need to apply wind corrections appropriately

If time allows, attempt standard entry in to holding pattern on limited panel

Recover to airfield for demonstration ILS approach and landing demonstrated by instructor

1.4.3.6.6 Debrief

Standard debrief

Instructor Only

1.4.3.7 IF Detail F13

1.4.3.7.1 Summary

Detail F13 Radar Circuits	
	Exercise
F13	Establish Shared Cockpit Connection
	Pre-flight Checks
	Taxi Out
	Take Off to radar vectored ILS
	Go around
	Radar circuits to include SRA
	Taxi In
	Parking

1.4.3.7.2 Objectives

- Introduce use of ILS
- Introduce approach briefing and planning
- Aeroplane management

1.4.3.7.3 Session Proficiency Criteria

- Track horizontal and vertical profiles within half scale deflection CDI and 1 dot GS down to DA(H)
- Can fly a go-around from DA(H) on instruments

1.4.3.7.4 Preview Item

Procedural approaches (when no radar available)

1.4.3.7.5 Detail F13 Session Guide

Before departure – have trainee brief you on the approach procedure

- What needs to be considered?
  - DA(H)
  - Weather
  - Go-around procedure
  - Traps

Take off and fly radar vectored circuit to ILS final

Continue to DA(H) and perform go-around

Repeat as required including a variety of different scenarios e.g.:

- Surveillance Radar Approach
- Touch and go
- Full stop landing
- Go-around from below DA(H)
- Go-around from above the missed approach altitude
- Single engine

1.4.3.7.6 Debrief

Standard debrief

Instructor Only

1.4.3.8 IF Detail F14

1.4.3.8.1 Summary

Detail F14 Procedural Approaches	
	Exercise
F14	Establish Shared Cockpit Connection
	Pre-flight Checks
	Taxi Out
	Take Off and Route to Training Area
	General handling practice
	Return for procedural NDB approach
	Go around
	Procedural ILS
	Land
	Taxi In
	Parking

1.4.3.8.2 Objectives

- Introduce NDB and ILS procedural approaches
- Highlight restricted landing rate

1.4.3.8.3 Session Proficiency Criteria

- Can fly a full procedural NDB or ILS approach to DA(H)/MDA(H)

1.4.3.8.4 Preview Item

None

1.4.3.8.5 Detail F14 Session Guide

Take off and leave the circuit. This provides an opportunity to practice general handling including limited panel.

Trainee briefs approach:

- What needs to be considered?
  - DA(H)
  - Weather
  - Go-around procedure
  - Traps

Return to LPL to enter the published hold using standard hold entry procedure. When ready, commence procedural NDB approach to go-around.

Repeat to land

Repeat the above for a procedural ILS

1.4.3.8.6 Debrief

Standard – reinforce how tracking techniques learnt in previous lessons have been applied

Instructor Only

1.4.3.9 IF Detail F15

1.4.3.9.1 Summary

Detail F15 Unusual Attitudes	
	Exercise
F15	Establish Shared Cockpit Connection
	Pre-flight Checks
	Taxi Out
	Take Off and Route to Training Area
	Unusual attitude recognition and recovery – full and limited panel
	Return for radar vectored ILS and landing
	Taxi In
	Parking

1.4.3.9.2 Objectives

- Recognise an unusual attitude in IMC
- Practice upset recovery techniques on both full and limited panel

1.4.3.9.3 Session Proficiency Criteria

- Can recognise an unusual attitude by reference to both full and limited panel
- Applies correct recovery techniques

1.4.3.9.4 Preview Item

Demonstrate stall and recovery

1.4.3.9.5 Detail F15 Session Guide

Take off and route to training area. Note that any manoeuvres must be completed by minimum 3000 ft AGL per Flying Orders: initial climb to 5000-6000 ft AGL recommended.

Practice nose-high recovery. Demonstrate how to recognise a nose-high attitude: pay particular attention to ASI/VSI/altimeter as these will be used on the limited panel.

Repeat with nose-low recovery using similar technique

Repeat with limited panel and with and without bank

- Maximum bank angle 45°
- Maximum pitch ±15°

Return to airfield for radar vectored ILS and landing

1.4.3.9.6 Debrief

Standard debrief – point ahead to next lesson – instrument stalling

Think about how attitudes and instrument indications seen in this lesson correlate and how they apply to stall recognition.

Instructor Only

1.4.3.10 IF Detail F16

1.4.3.10.1 Summary

Detail F16 Instrument Stalling	
	Exercise
F16	Establish Shared Cockpit Connection
	Pre-flight Checks
	Taxi Out
	Take Off and Route to Training Area
	Stall recognition and recovery – full and limited panel
	Return for visual circuit join and landing
	Taxi In
	Parking

1.4.3.10.2 Objectives

- Recognise pre-stall and stall condition on instruments
- Practice stall recovery procedures on both full and limited panel

1.4.3.10.3 Session Proficiency Criteria

- Can recognise pre-stall and stall conditions by reference to full and limited panel
- Applies correct recovery technique

1.4.3.10.4 Preview Item

None

1.4.3.10.5 Detail F16 Session Guide

Take off and route to training area. Note that stall recovery must be completed no lower than 3000 ft AGL per Flying Orders.

Review standard stall recovery procedure and symptoms of the approaching stall. Demonstrate a standard stall entry and recovery on both full and limited panel: ask trainee to observe instrument indications

Trainee to repeat until proficient

Return to airfield for procedural non-precision instrument approach and landing

1.4.3.10.6 Debrief

Point ahead to next lesson – asymmetric instrument circuits.

Instructor Only

1.4.3.11 IF Detail F17

1.4.3.11.1 Summary

Detail F17 Asymmetric Radar Circuits	
	Exercise
F17	Establish Shared Cockpit Connection
	Pre-flight Checks
	Taxi Out
	Take Off with EFATO
	Asymmetric radar vectored circuit to ILS
	Go around
	Asymmetric radar circuits to include SRA
	Taxi In
	Parking

1.4.3.11.2 Objectives

- Consolidate asymmetric flying and approaches
- Practice EFATO and RTO drills

1.4.3.11.3 Session Proficiency Criteria

- Can consistently fly asymmetric instrument circuits within flight test limits
- Correctly identifies and handles a failed engine in accordance with standard procedures

1.4.3.11.4 Preview Item

Asymmetric procedural approaches

1.4.3.11.5 Detail F17 Session Guide

Trainee to brief planned instrument approach procedure. Review RTO and EFATO procedures.

Take off and fly radar vectored circuit to ILS final

Continue to no lower than Asymmetric Committal Height and perform go-around

Repeat as required including a variety of different scenarios e.g.:

- SRA
- Full stop landing
- Go-around from above the missed approach altitude

Practice RTO on instructor-selected departure

1.4.3.11.6 Debrief

Standard debrief

Instructor Only

1.4.3.12 IF Detail F18

1.4.3.12.1 Summary

Detail F18 Asymmetric Procedural Approaches	
	Exercise
F18	Establish Shared Cockpit Connection
	Pre-flight Checks
	Taxi Out
	Take Off and Route to Training Area
	General instrument handling practice
	Engine failure in cruise
	Asymmetric full procedural non-precision approach
	Go around
	Asymmetric procedural approaches
	Taxi In
	Parking

1.4.3.12.2 Objectives

- Consolidate asymmetric flying and approaches
- Practice engine failure drills

1.4.3.12.3 Session Proficiency Criteria

- Can consistently fly asymmetric procedural approaches within flight test limits
- Correctly identifies and handles a failed engine in accordance with standard procedures

1.4.3.12.4 Preview Item

None

1.4.3.12.5 Detail F18 Session Guide

Take off and route to general flying area. En-route there is an opportunity to practice general handling. At an appropriate moment in the cruise, fail an engine.

Trainee to brief an appropriate full procedural non-precision approach. By this stage the trainee should be confident and proactive in reading the approach chart, identifying potential threats and effectively managing/making time to deal with the failure.

When ready, route back to the airfield to conduct the briefed approach.

Continue no lower than Asymmetric Committal Height and perform go-around

Repeat as required including a variety of different scenarios e.g.:

- Precision and non-precision approaches (full procedure)
- Full stop landing
- Go-around from above the missed approach altitude

1.4.3.12.6 Debrief

Standard debrief

Instructor Only

1.4.3.13 IF Detail F19

1.4.3.13.1 Summary

Detail F19 IFR Cross Country 1	
	Exercise
F19	Establish Shared Cockpit Connection
	Pre-flight Checks
	Taxi Out
	Take Off and fly SID
	Route flight
	STAR
	Holding
	Full procedural approach
	Taxi in
	Parking

1.4.3.13.2 Objectives

- Plan and execute a commercial IFR flight from Liverpool to Glasgow

1.4.3.13.3 Session Proficiency Criteria

- Perform all aspects of flight to flight test standards
- Demonstrates and applies knowledge of practical flight planning
- Demonstrates a good standard of aeronautical decision making and non-technical skills

1.4.3.13.4 Preview Item

None

1.4.3.13.5 Detail F19 Session Guide

Weather:

- EGGP 060/6 0700 OVC008 06/04 Q1033
- EGPF 050/3 0500 OVC007 04/03 Q1033
- EGPH 060/5 1100 OVC008 04/01 Q1034

Loadsheet Data:

- Freight: 60kg
- Pilot weight TBN
- Passenger 1 weight 90kg
- Passenger 2 weight 75kg

Trainee to plan flight, file flight plan and perform applicable performance and weight and balance calculations. Fuel to be calculated and loaded according to BAV minimum fuel requirements (i.e. not full tanks). The aircraft will be fully serviceable and compliant with the MEL.

By this stage the trainee should be able to identify a suitable route and alternates taking in to account planning minima, contingencies and prevailing weather conditions.

The trainee's ADM skills should be challenged in this detail through the use of a suitable scenario which may be introduced by the instructor at a suitable moment. Some possible examples of scenarios could include, but are not limited to:

- Runway at destination becomes blocked due to an aircraft with a burst tyre
- Passenger medical emergency
- 'Pushy' ATC
- 'Pushy' passenger
- Ground equipment failures

Scenarios should be plausible occurrences which might be encountered on a normal revenue flight rather than extreme events requiring immense handling skill and luck to escape. A good scenario should not have an immediately obvious right or wrong solution; the objective is to test the trainee's ability to weigh up the options and make a sensible command decision balancing safety, legal and commercial considerations. It is therefore unlikely (and, indeed, undesirable!) for there to be a single 'right' answer.

1.4.3.13.6 Debrief

Debrief any handling points, though by this stage the trainee should be confident and proficient in handling the aircraft. In particular however, use facilitative techniques to discuss the trainee's decision-making throughout the flight; why was a particular course of action taken and was it the most effective?

Point towards the next detail which will be the return sector to Liverpool.

Instructor Only

1.4.3.14 IF Detail F20

1.4.3.14.1 Summary

Detail F20 IFR Cross Country 2	
	Exercise
F20	Establish Shared Cockpit Connection
	Pre-flight Checks
	Taxi Out
	Take Off and fly SID
	Route flight
	STAR
	Holding
	Full procedural approach
	Taxi in
	Parking

1.4.3.14.2 Objectives

- Plan and execute a commercial IFR flight from Glasgow to Liverpool

1.4.3.14.3 Session Proficiency Criteria

- Perform all aspects of flight to flight test standards
- Demonstrates and applies knowledge of practical flight planning
- Demonstrates a good standard of aeronautical decision making and non-technical skills

1.4.3.14.4 Preview Item

None

1.4.3.14.5 Detail F20 Session Guide

Weather:

- EGPF 050/3 0500 OVC007 04/03 Q1033
- EGCC 060/5 0800 OVC008 05/04 Q1033
- EGBB 070/4 1800 OVC009 06/03 Q1033
- EGGP 060/6 0700 OVC008 06/04 Q1033

Loadsheet Data:

- Freight: 30kg
- Pilot weight TBN
- Passenger 1 weight 90kg
- Passenger 2 weight 75kg

Trainee to plan flight, file flight plan and perform applicable performance and weight and balance calculations. Fuel to be calculated and loaded according to BAV minimum fuel requirements (i.e. not full tanks). The aircraft will be fully serviceable and compliant with the MEL.

By this stage the trainee should be able to identify a suitable route and alternates taking in to account planning minima, contingencies and prevailing weather conditions.

The trainee's ADM skills should be challenged in this detail through the use of a suitable scenario which may be introduced by the instructor at a suitable moment. Some possible examples of scenarios could include, but are not limited to:

- Runway at destination becomes blocked due to an aircraft with a burst tyre
- Passenger medical emergency
- 'Pushy' ATC
- 'Pushy' passenger
- Ground equipment failures

Scenarios should be plausible occurrences which might be encountered on a normal revenue flight rather than extreme events requiring immense handling skill and luck to escape. A good scenario should not have an immediately obvious right or wrong solution; the objective is to test the trainee's ability to weigh up the options and make a sensible command decision balancing safety, legal and commercial considerations. It is therefore unlikely (and, indeed, undesirable!) for there to be a single 'right' answer.

1.4.3.14.6 Debrief

Debrief any handling points, though by this stage the trainee should be confident and proficient in handling the aircraft. In particular however, use facilitative techniques to discuss the trainee's decision-making throughout the flight; why was a particular course of action taken and was it the most effective?

Instructor Only

1.4.3.15 IF Detail F21

1.4.3.15.1 Summary

Detail F21 Instrument Rating Skill Test	
	Exercise
F21	Establish Shared Cockpit Connection
	Instrument Rating Skill Test

1.4.3.15.2 Objectives

- Plan and execute a commercial, passenger-carrying IFR flight whilst acting as pilot-in-command and operating as a single crewmember

1.4.3.15.3 Session Proficiency Criteria

- Complete all sections of the AFT Skill Test to Flight Test Standard

1.4.3.15.4 Detail F21 Session Guide

The purpose of the flight is for the candidate to demonstrate his ability to plan and conduct a Commercial Air Transport flight whilst acting as pilot-in-command and operating as a single crewmember. The briefed profile will be conducted in simulated IMC and the flight will include simulated abnormal or emergency procedures and general instrument flying manoeuvres.

Passenger safety, comfort and reassurance must be considered throughout the flight. The candidate is to assume that the Examiner is a passenger who will act as Safety Pilot when the candidate is flying by sole reference to instruments. The candidate is not to expect any assistance from the Examiner.

The aeroplane must be operated throughout in accordance with the POH and BAVirtual Operations Manual/Flying Order Book. The Examiner will require confirmation of the various speeds and configurations to be used at each phase of flight.

Pre-Flight Operations and Departure (Section 1)

The candidate will be expected to carry out a safe and practical inspection of the aeroplane prior to flight. This should include functional checks of the radio, navigation equipment, autopilot and any other of the installed equipment that the candidate proposes to use during the flight. The Examiner must be briefed, as a passenger, on the position and method of use of emergency exits, safety belts, life jackets and all other devices required by the ANO and intended for use by passengers in the case of emergency. The candidate must instruct the Examiner in the action he must take in the event of an emergency.

The candidate must be prepared to deal with simulated abnormal or emergency operations at any stage.

When ready for departure, the candidate should assess the crosswind component and confirm this to the Examiner. The departure should comply with any instructions given by ATC and/or published procedures.

En-route Procedures (Section 3)

Section 3 is usually flown after departure to ensure an efficient flow to the flight. The planned route should be accomplished in a practical manner utilising RNAV, VOR and/or NDB tracking as appropriate to the classification of airspace. ATC units endeavour to integrate test aircraft into the traffic flow and on occasion offer them some priority, but candidates must be prepared to accept re-routings, radar vectoring or holding during busy periods. ATC instructions and clearances must be complied with at all times and the candidate will be expected to negotiate for revised clearances if appropriate to achieve the planned routing and profile. The examiner will not normally interfere with imposed changes to the briefed exercise unless these will compromise the requirements of the test.

Radio navigation aids must be tuned and identified before use in accordance with normal operating practice. The examiner will not interfere with any radio or navigation equipment except where it is necessary to 'de-tune' an aid that is not required for that procedure, e.g. ILS de-tuned during the non-precision approach or during the holding pattern. Any radio navigation aid de-tuned by the examiner will be restored to their original state at an appropriate time.

The IFR route and profile will be selected by the examiner so that he can see and assess a mixture of RNAV, VOR and/or ADF tracking, to and from facilities, and using beam bar (HSI/CDI) and single needle (RMI/RBI) displays. Unless turning at a defined fly-over waypoint, anticipation of the next track by turning at a reasonable distance/radius from the facility is expected.

IFR approved RNAV equipment is now a requirement in UK Class “A” airspace and must be used accordingly. The equipment and installation must be 'approved' for en-route IFR operations and meet the required navigation performance criteria (generally RNP 5) before being used as the primary source of data for aircraft tracking. FM immunity requirements must be complied with. GNSS equipment must have a current database. Waypoints and flight plan routing may be inserted prior to or during flight. The candidate remains entirely responsible for checking data entries and particular care should be taken if using user defined waypoints.

Execution of an en-route Hold, if required by ATC, will be assessed but does not satisfy the requirement for a terminal Hold in sections 4 or 5.

Where aircraft are fitted with a flight director and/or autopilot and the equipment is intended to be used during the flight, the candidate will be expected to carry out the necessary pre-flight checks to establish serviceability. The equipment must be operated in accordance with any limitations in the AFM/POH. Electric trim system may be used as prescribed by the AFM/POH and should also be tested. Altitude alerting systems and speed bugs are permitted. Use of autopilot and flight director is permitted after departure and after achieving straight and level, trimmed, cruise flight en-route at the planned or assigned cruising level to the next waypoint. Permitted modes are Roll, Heading, Altitude and Vertical Speed. Tracking by using a NAV mode is not permitted. The examiner will indicate when autopilot and FD use is permitted and when it must be discontinued.

Terminal Hold (Section 4 and/or Section 5)

A holding pattern will be required in either normal or asymmetric aeroplane configuration. The holding pattern should normally be conducted using a 'single needle' instrument presentation from either an NDB, VOR or GNSS facility or fix. If a needle presentation is not available a beam bar (HSI/CDI) presentation is permitted. The hold shall be based on a

published procedure and using a terminal facility; it may be offset from the overhead if so prescribed. Any moving map display will be obscured or removed during the hold and procedural approach, or the range adjusted so that the display provides no useful information. The hold may be executed before the approach or following a Missed Approach.

Precision Approach (Section 4) & Non-Precision Approach (Section 5)

Prior to flying an instrument approach, the candidate is expected to confirm that the weather conditions are suitable for commencing and continuing the approach. Procedures must be "notified" procedures i.e. published in the iAIP; it is not acceptable under any circumstances for an examiner to brief a candidate to fly a locally produced or designed procedure. The arrival and approach must be flown in accordance with the published procedure or as otherwise directed by ATC. When flying a procedural approach based on VOR or NDB, the examiner will obscure or remove a moving map display, or change the range scale, such that tracking during the procedure is accomplished by reference to the flight navigation instruments. Similarly, the examiner may require that wind vectors and predictive or track-made-good indications are removed from the display. The non-precision approach requirement may be met by NDB, VOR, RNAV or Localiser only procedures as briefed by the examiner. A RAIM check must be completed prior to any RNAV GNSS approach (before or during flight). Any published RNAV approach will be treated as a procedural approach for test purposes and all information required to fly the procedure, including moving map displays, may be used. However, where a moving map is available for a GNSS approach, the examiner should assess the candidate's situational awareness and tracking by using "conventional" instruments at some other stage of the flight. This might be achieved, for example, by briefing the candidate to fly the precision approach (ILS) also as a procedural approach but with the moving map display inhibited. At the time of drafting this document, a GNSS approach that provides scaled lateral and vertical guidance (i.e. LPV approach) is not currently accepted as a precision approach and will not substitute for the ILS approach. Similarly, a GNSS approach that provides vertical guidance (e.g. LNAV+V) will not be accepted for the purposes of assessing Section 5, the non-precision approach unless the vertical guidance is inhibited.

Each approach is to be flown with the aeroplane correctly configured and in trim such that a stable approach path is maintained to DA/H or MDA/H as declared. The examiner will expect the candidate to brief ATC on the intentions after the approach and subsequent manoeuvres. The requirement from the approach may be to land, go-around, depart under IFR or manoeuvre visually to the appropriate runway. A non-aligned approach (not within 30°) will terminate at the MDA/H, DA/H, or circling minima, whichever is the higher. A go-around may then be required after visually manoeuvring to the landing runway. Irrespective of whether the intention is to land or go-around, the candidate will be expected to arrive at DA/H or MDA/H with the aircraft configured and at a speed from which a successful landing could be made at the designated touchdown point without excessive manoeuvring or speed/power/configuration changes. The examiner may ask to the candidate to land from any approach.

ATC may ask for higher or lower than normal pattern speeds and candidates will be expected to demonstrate flexibility to assist with traffic separation if aircraft performance permits. Any deviation from standard approach speed and configuration is expected to be "normalised" by 3nm or 1000' AAL so that a normal landing can be made at the designated touchdown point.

The examiner may intervene in the interest of the candidate if compliance with ATC would compromise the assessment of the test.

Simulated Asymmetric Flight (Section 6)

The EFATO may be combined with Sections 4 or 5. Correct touch drills are to be used where appropriate during any simulated emergency and the overall safety of the aeroplane and occupants must be maintained throughout.

At a safe height after take-off or go-around the examiner will simulate an engine failure by closing one of the throttles/power levers. The candidate will be expected to retain control of the aeroplane, identify the 'failed' engine and carry out the appropriate engine shut down and propeller feathering procedures using touch drills where necessary, the examiner will be responsible for setting zero thrust and for the management of the (simulated) failed engine.

Emergency radio calls should be made aloud to the examiner but not transmitted. If climb performance or the ability to manoeuvre is restricted, it may be prudent to advise ATC before the approach as this may affect traffic departing behind. Candidates should not assume that any practice emergency is complete until told so by the examiner. On completion of the drills and when asymmetric handling has been assessed, the examiner will be responsible for restoring power as appropriate.

The candidate will be required to carry out an approach to go-around under asymmetric power and an asymmetric approach to land. The go-around should be flown by reference to instruments but where the DA/H or MDA/H is higher than ACA/H examiners may, at their discretion, simulate cloud break and the acquisition of visual references by removing view limiting devices at or just before DA/H or MDA/H. In this case, the candidate will be expected to continue the approach visually as if to land but then initiate a go-around at ACA/H simulating for example, that the runway was blocked.

General Handling (Section 2)

The examiner will brief his intentions to either complete this section after flying all of the other sections or at a convenient time during transit between airfields. With the instrument screening/devices in place, the examiner will be responsible for navigation, location, look out and ATC liaison. The candidate will be responsible for internal security, configuration changes and observance of limitations, etc. On completion of the section the examiner will ensure that the candidate is aware of his location, the level of ATC service and his next task, before handing back control.

Full Panel: Flight by reference to full panel instruments will include:

- Level flight at various speeds, trim.
- Level turns at rate one.
- Climbing and descending turns at rate 1.

Note: Most of the items above will usually be assessed during the departure, en-route and approach sections of the flight.

- Recoveries from unusual attitudes, including sustained 45° bank turns and steep descending turns.
- Recovery from incipient stalls in level flight, climbing/descending turns and in the landing configuration, with minimum height lost, using the Standard Stall Recovery, recovering to the best rate of climb (Vy) and back to any heading designated by the examiner when appropriate.

Limited Panel: Flight by reference to limited panel will include:

- Straight and level flight and stabilised climb or descent at a given speed in straight flight.
- Level turns onto given headings at rate one using timed or compass turn methods.
- Recovery from unusual attitudes, including climbing, descending and level steep turns.. Recovery should be made in reasonable time to trimmed straight and level flight at the nominated speed with minimum loss of height.

At the conclusion of the flight the examiner may ask questions in order to clarify certain items or actions. The candidate will then be informed of the result and will be given a brief reason for any failed item. The examiner will state the requirements for any retest and indicate any mandatory or recommended retraining. Written notification of the result and any retraining will be given on the test report form and notice of failure (if required). Copies of the form will be distributed to the candidate and to FTM. The Examiner will be responsible for updating the candidate's VATSIM CERT record as appropriate.

Should any test item not have been completed or deemed not assessable by the examiner, then that item will need to be completed on a subsequent flight before the overall test result can be determined.

Should the result be a Partial Pass or Fail, the examiner will offer to debrief the candidate more fully and give advice on any aspect of the test which the candidate may find useful during any subsequent attempt.

Assessment Criteria

The flight will be assessed as if the candidate was operating under IFR with a passenger. The safety, comfort and briefing of passengers must be considered. The candidate shall demonstrate ability to:

- Operate the aeroplane within its limitations
- Complete all manoeuvres with smoothness and accuracy
- Exercise good judgement and airmanship
- Apply aeronautical knowledge of procedures and regulations as currently apply
- Maintain control of the aeroplane at all times in such a manner that the successful outcome of a procedure or manoeuvre is never in doubt.

Throughout the flight the aeroplane should be flown as accurately as possible but not at the expense of smooth, co-ordinated control inputs and correct technique. The limits or tolerances specified in the VATSIM PTD P5 Standards are reproduced below. They are for guidance and candidates should strive to achieve these throughout the flight, but momentary excursions do not necessarily indicate that a 'failure' will result. The examiner will be looking for the candidate to recognise the error promptly and make smooth and timely corrections.

The examiner will make allowance for adverse weather conditions such as turbulence and the handling qualities and performance of the aeroplane used.

1.4.3.15.5 Skill Test Schedule and Standard

Section 1 - Departure

a. Use of Flight Manuals (or equivalent)

- Use of the Flight Manual and Operations Manual to determine aeroplane performance; mass and balance and aeroplane documents to determine acceptability for the flight.

b. Use of Air Traffic Services document and weather document

- Use of the correct documents, including maps; charts and approach procedure plates to prepare flight plan and flight log; collating and interpreting the weather documents to determine the route weather.

c. Preparation of ATC flight plan and IFR flight log

- Preparation of the ATC IFR flight plan for the route, including any off-airways sectors, and preparation of navigation flight log.
- Obtains and assesses all elements of the prevailing and forecast weather conditions for the route.
- Completes an appropriate flight navigation log.
- Completes the required ATC flight plan(s) and ensures that all required airfields are addressed.
- Determines that the aeroplane is correctly fuelled, loaded and legal for the flight.
- Confirms any aeroplane performance criteria and limitations applicable in relation to runway and weather conditions.
- Demonstrates sufficient knowledge of the regulatory requirements relating to instrument flight.
- Checks NOTAM and where applicable completes a RAIM check (AUGUR)

d. Pre-flight Inspection

Full initial pre-flight inspection in accordance with the approved check list assuming the risk of 'icing conditions'.

- Performs all elements of the aeroplane pre-flight inspections as detailed and applicable to the actual or simulated weather conditions.
- Confirms that the aeroplane is in a serviceable and safe condition for flight.
- Checks and completes all necessary documentation.
- Takes appropriate action with respect to any identified unsatisfactory conditions.
- Confirms that any planned RNAV routes are programmed and desired RNAV approaches are correctly installed.

e. Weather Minima

- An assessment of the weather affecting the departure, route, destination and alternate airfields.
- Determination of the expected instrument approach minimum heights/altitudes.

Candidates will be expected to operate to the minimum weather conditions stated in the BAV operations manual.

f. Taxiing

- Passenger briefing
- Correct taxiing technique, procedures and checks
- Compliance with aerodrome markings and indicators including marshalling instructions and signals

g. Pre take-off briefing

- Obtaining ATC departure clearance, flight deck preparation, confirmation of departure and passenger emergency briefing.
- Actions to be taken with regard to the aeroplane if an emergency occurs during departure should be covered in the pre-flight Main Briefing.
- Completes all recommended taxying checks and procedures.
- Complies with airport markings and signals.
- Completes all departure checks and drills including engine operations.
- Obtains ATC clearance.
- Completes an appropriate passenger briefing. (Emergency handling details should be discussed in the pre-flight brief).
- Confirms any performance criteria including crosswind condition.
- Actions any anti-icing procedures.
- Positions the aeroplane correctly for take-off and advances the throttles to take off power with appropriate checks.
- Conforms to the correct take off technique using the recommended speeds for rotation (Vr) and initial climb.
- Ensures a safe climb and departure adjusting power and aeroplane configuration as appropriate.
- Completes all necessary after take-off checks.

h. Transition to instrument flight

- Take-off in accordance with the performance calculations using the correct techniques.
- Establish the climb, complete a smooth transition to instrument flight
- Complete the after take-off checks and drills.

i. Instrument departure procedure

Complete the Standard Instrument Departure procedure (SID) or follow the ATC departure instructions to join controlled airspace; use of correct altimeter setting procedure; maintaining aeroplane control, speed, heading and level.

- Maintains directional control and drift corrections within acceptable limits of speed, heading, height and track.
- Identifies any navigation aids used.
- Follows any noise routing or departure procedures and ATC clearances.
- Completes all necessary climb checks including altimeter setting procedures and ice precautions.

Section 2 - General Handling

Control of the aeroplane by sole reference to instruments including:

a. Full Panel

- Straight and level flight at various speeds maintaining balance and trim.

b. Full Panel

- Climbing and descending turns at Rate 1.

c & d Full Panel

- Recoveries from the approach to the stall in level flight, climbing/descending turns and in the landing configuration.
- Recovers from unusual attitudes including sustained 45° bank turns and steep descending turns using the correct technique to minimise height lost.

e. Limited Panel

- Manoeuvres including straight and level flight and stabilised climbing and descending at a given speed.
- Level turns at Rate 1 onto given headings.
- Recoveries from unusual attitudes.
- Controls the aeroplane without use of gyro heading and attitude instruments within the nominated limits (due consideration will be given for turbulence).
- Completes flight in straight and level, and climbing and descending, at nominated speeds. Turns flown at Rate 1 onto nominated headings, using the correct technique and demonstrating correct instrument scan and interpretation.
- Recovers from unusual attitudes including sustained 45° bank turns and steep descending and climbing turns using the correct technique to minimise height lost.

Section 3 - En-Route IFR Procedures

a. Tracking

- Tracking, including interception, e.g. NDB, VOR, RNAV.
- Intercept and maintain the route or amended route including tracking to and from an NDB or VOR or RNAV derived position.

Note: RNAV equipment (at least RNP 5 or higher) is now mandatory for use in CAS in UK airspace.

b. Use of radio aids

- Correct use of radio aids with regard to promulgated range, identification and interpretation.
- Use of ATIS/VOLMET where available.

c. Level flight control

- Smooth control of heading, altitude, speed, power, trim and ancillary controls.
- Correct use of autopilot and flight director where appropriate and permitted by the examiner.

d. Altimeter settings

- Correct altimeter setting procedure and cross-checking, monitoring of en-route MSA.

e. Timing and ETAs

- Timing and revision of ETAs including en-route hold procedures if required.

f. Monitoring flight progress

- Completion of the flight log to monitor flight progress, provide position reports and manage the fuel system and usage
- Management of the other aeroplane systems
- Use of checklist.

g. Ice protection procedures

- Monitoring of OAT, icing risk and ice accretion rate (simulated if necessary);
- Correct use of anti-icing and de-icing procedures.

h. ATC Liaison

- Follows the flight planned route or complies with any other ATC route requirements within the operating limits specified.
- Uses the correct R/T procedures and phraseology.

Section 4 - Precision Approach

a. Navigation Aids

- Setting and checking of navigational aids, identification of facilities.
- Correct use of navigation aids with regard to promulgated range, identification procedures, failure monitoring and interpretation.

b. Arrival procedures

- Descent planning and consideration of MSA/SSA.
- Completion of the published arrival procedure or as instructed by ATC including altimeter setting,

c. Approach and Landing Briefing

- The approach briefing including weather and confirmation of instrument approach procedure minima
- All procedures, checks and drills in preparation for landing.

d*. Holding Procedure

- Complete appropriate entry procedure followed by a standard ICAO hold (or as published) using a needle pointer presentation (where available), making the appropriate corrections to heading and time for the known wind.

e. Published Approach Procedure

- Compliance with the published precision approach procedure
- Vertical and horizontal profile to the nominated minima.

f. Approach timing

- Monitor or control the approach procedure using timing as necessary.

g. Altitude, speed and heading control

- Establish a stabilised approach, in-trim for the aeroplane configuration and speed, using the correct techniques for attitude, heading and power control
- Correct assessment of drift and rate of descent.

h*. Go-around

- At the minima, or as directed by ATC, transition to a climb at the correct speed and complete the checks.

i*. Missed approach procedure/landing

- Follow the missed approach procedure or continue for visual landing or circle for landing. (If flown first, following the precision approach, a go-around and missed approach procedure will normally be required.)

j. ATC liaison

- ATC liaison using the correct RTF procedures and phraseology, and compliance with procedures and clearances.

Note: * items may be performed in Section 4 or 5

Hold and Instrument Approach

- Completes an approach briefing and the checks and drills for landing; sets and identifies any navigation aids; uses the appropriate altimeter setting and RTF procedures to liaise with ATC to prevent disruption to commercial traffic.
- Completes any holding procedure with appropriate corrections for tracking and timing to achieve a standard hold.
- Complies with the published arrival and approach procedures using timing corrected for wind when necessary.

Precision Approach

- Selects and complies with the appropriate ILS instrument approach procedure.
- Setting and checking of navigational aids, identification of facilities.
- Complies with all ATC instructions and clearances.
- Uses correct R/T procedures.
- Establishes the appropriate aeroplane configuration and airspeed for the phase of the approach.
- Completes the necessary aeroplane checks and drills.
- Completes the intermediate approach as required to establish the final approach segment within the specified flight tolerances.
- Establishes the final approach segment and maintains the approach path in horizontal and vertical profile (max 1/2 scale deflection) to Decision Height/Altitude.
- Controls the aircraft as necessary to make adjustment to and achieve a stable and trimmed final approach path.
- Initiates a missed approach at Decision Height/Altitude DH/A. (Transitions to land if so required.)

Missed Approach

- Demonstrates knowledge of missed approach procedure.
- Initiates the missed approach procedure upon reaching Decision Height/Altitude if required visual references for landing are not obtained.
- Establishes aeroplane in a safe climb out and initiates aeroplane configuration changes as required to achieve as least the performance climb segments.
- Follows designated missed approach procedure or as required by ATC.

Section 5 - Non-Precision Approach

a. Navigation Aids

- Correct use of navigation aids with regard to promulgated range, identification procedures, failure monitoring and interpretation.

b. Arrival Procedures

- Descent planning and consideration of MSA/SSA
- Completion of the published arrival procedure or as instructed by ATC including altimeter setting
- Conducts a RAIM check where applicable.

c. Approach and landing briefing

- The approach briefing including weather and consideration of instrument approach procedure minima
- All procedures, checks and drills in preparation for landing.

d*. Holding procedure

- Complete appropriate entry procedure followed by a standard ICAO hold/published hold using a needle pointer presentation, where available, making the appropriate corrections to heading and time for the known wind.

e. Published approach procedure

- Compliance with the published non-precision approach procedur
- Maintenance of the published vertical and horizontal profile to the nominated minima
- Maintenance of the correct CDFA profile if appropriate.

f. Approach timing

- Monitor or control the approach procedure using timing as necessary.

g. Control of the aeroplane

- Establish a stabilised approach, in-trim for the aircraft configuration and speed, using correct techniques for attitude, heading and power control
- Correct assessment of drift and rate of descent
- Maintain Ops Manual limits for a CDFA approach if appropriate.

h*. Go-around

- At the Missed Approach Point, or at the nominated DA/H if flying a CDFA technique, or as directed by the examiner/ATC, transition to a climb at the correct speed and complete the checks.

i* Missed approach procedure/landing

- Follow the missed approach procedure, or continue for visual landing, or circle for landing or appropriate manoeuvre to land.

j. ATC Liaison

- ATC liaison using the correct R/T procedures and phraseology, and compliance with procedures and clearances.

Note: * items may be performed in Section 4 or 5.

Non Precision Approach

- Selects and complies with the appropriate VOR/NDB/LOCALISER-Only/RNAV instrument approach procedure.
- Setting and checking of navigational aids, identification of facilities.
- Complies with all ATC instructions and clearances.
- Uses correct R/T.
- Establishes the appropriate aeroplane configuration and airspeed for all phases of the approach.
- Completes the necessary aeroplane checks and drills.
- Completes the intermediate approach to establish the final approach segment within the specified limits.
- Establishes the final approach segment and maintains the approach track and vertical profile to MDH/A or circling minima.
- If CDFA techniques are being used, executes the Missed Approach at the nominated DA/H if not visual, otherwise continues towards the Missed Approach Point until visual flight conditions are established so as to complete transition to a visual approach or manoeuvre for landing
- Execute the Missed Approach if not visual.

Missed Approach

- As for the precision approach.

Section 6 - Simulated Asymmetric Flight

a. Simulated Engine Failure After Take Off or on go around

- Following a simulated engine failure after take-off or on go around, maintaining control by sole reference to instruments and completing the emergency drills (correct touch drills where required).

Note: Engine failure will be simulated only after the aeroplane has achieved at least the take-off safety speed and at a safe altitude

b. Asymmetric approach and procedural go around

- One approach, normally the second, will be flown to a procedural missed approach or as directed by ATC whilst maintaining the climb schedule for the (simulated) asymmetric condition.
- When an asymmetric NPA is flown the examiner may require the candidate to make a visual transition to the landing runway prior to the asymmetric go around at ACA/H.

c. Asymmetric approach and full stop landing

- Following the asymmetric go around and, when the required visual references have been established, continue into the circling approach procedure or appropriate visual circuit to land.
- If weather conditions preclude a visual manoeuvre the final asymmetric approach to land may, if circumstances permit, be made from another instrument approach.

d. ATC Liaison

- Compliance – R/T Procedure, Airmanship

Simulated Asymmetric Flight

- Maintains control following a simulated engine failure after take-off; completes the necessary checks and drills: maintains the correct speed and continues to follow ATC instructions
- Trimming
- Completes an asymmetric go-around into a circling approach or other appropriate manoeuvre maintaining control at safe speeds
- Completes an asymmetric approach and landing; complies with ATC instructions and maintains satisfactory lookout to avoid other circuit traffic

Approach and Landing

- Considers the actual weather and wind conditions, landing surface and obstructions.
- Plans and follows the circling approach or circuit pattern and orientation with the landing runway.
- From the circling approach or visual circuit establishes the recommended aeroplane approach configuration, adjusting speed and rate of descent to maintain a stabilised approach pattern.
- Where necessary completes a further asymmetric instrument approach to land.
- Selects and achieves the appropriate touchdown area.
- Adjusts descent and roundout (flare) to achieve a safe landing with little or no float with appropriate drift and crosswind correction.
- Maintains control and applies aeroplane brakes for a safe roll out.
- Completes necessary checks and drills.
- Observes ACA/H and satisfies criteria for safe landing before committing below ACA/H.

1.4.3.15.6 Debrief

The Examiner will comprehensively debrief the candidate on their performance, highlighting areas of strength as well as weaknesses.

1.4.3.15.7 Flight Test Tolerances

Although tests or checks may specify flight test tolerances, a candidate should not be expected to achieve these at the expense of smoothness or stable flight. An examiner should make due allowance for unavoidable deviations due to turbulence, ATC instructions and the handling qualities and performance of the type of aircraft used. Candidates may be advised that, during the flight, they should concern themselves only with flying and operating the aircraft to the best of their ability and not attempt to remain within the tolerances to the detriment of smooth handling. However, it is BAVirtual Flight Training policy to use these test tolerances when preparing candidates for test.

Profile	**Tolerance**
Normal Flight	±100ft
With simulated engine failure (ME)	±150ft
Limited or partial panel	*±200ft*
Starting go-around at decision alt/ht	+50ft/-0ft
Minimum descent altitude/height	+50ft/-0ft
'Not below' minima (from FAF altitude down to MDA/H)	*-0ft*
Circling minima	*+100ft/-0ft*
Asymmetric committal height/altitude	*-0ft*

At all times when using a single-needle display	±5°
At all times when using a deviation bar display	Half scale deflection azimuth and glidepath (precision approach)
DME arcing	*±1nm*

All engines operating	±5°
With simulated engine failure (ME)	±10°
Limited or partial panel	*±15°*

Take-off and approach	±5kt
All other flight regimes	±5kt
Limited or partial panel	*±10kt*
With simulated engine failure	+10/-5kt

Notes:

- Entries in italics are suggested tolerances
- Where a test is flown for more than one purpose, examiners should be mindful of the least stringent of the tolerances shown above