



# **Instructor Notes – Initial Flying Training Course**

**Revision 1  
August 2019**

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## 0 Record of Amendments

Change	Date Entered	Amended By

### 0.1 Revision Highlights

Rev 1 July 2019

New format

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# 1 Initial Flying Training Course Instructor Notes

## 1.1 Introduction

These notes are designed to aid the instructor in the delivery of the IFT syllabus and contain detailed lesson plans as well as advice and common student errors.

It is important to be aware that these notes are essentially uncontrolled and whilst every effort will be made to maintain them, it is possible that they may become outdated. OM-D Appendix C (Initial Flying Training) will always contain the current approved IFT syllabus and is always the final authority, alongside the BAVirtual-approved C172 flying manual.

## 1.2 Course Overview

Initial Flying Training Course Theory Syllabus	
Section	Subject
1	Shared Cockpit Setup and Introduction to Training Concepts
	Preparation for Flight
2	Straight and Level Flight
	Flying Straight and Level
3	Climbing and Descending
4	Medium Level Turns
5	Climbing and Descending Turns
6	Slow Flight
	Meteorology
7	Basic Stalling
	Altimetry
8	Steep Turns
9	Circuit Introduction
	Takeoff
	Landing
10	Leaving the Circuit
	Joining the Circuit
11	Navigation
	Flight Planning
	Performance
12	Glide Approaches
13	Emergencies including Forced and Precautionary Landings
	Engine Failure after Takeoff
14	Bad Weather Circuits
15	Short Field Operations

## 1.3 Theory Training

### 1.3.1 Shared Cockpit Setup and Introduction to Training Concepts

Shared Cockpit Setup and Introduction to Training Concepts	
Section	Subject
1a	<b>Course Introduction</b>
	Course introduction
	Training Methods
	Shared cockpit configuration
	Teamspeak Configuration
	Crib Sheets
	Shared cockpit quick configuration reference
	Teamspeak quick configuration reference
1b	<b>Preparation for Flight</b>
	Effects of Controls
	Powerplant
	Fuel System
	Instruments
	Flight (Lift/Weight/Thrust/Drag)
	Emergencies
	Airport & Weather
	Taxiways
	Restrictions

### 1.3.2 Straight and Level Flight

Straight and Level Flight	
2a	<b>Forces of Flight</b>
	The Four Forces of Flight
	Centre of Gravity, Centre of Pressure, Couples & Moments
	Lift/Drag Ratio
	Trimming
	Angle of Attack and Relative Wind
	Datums
	Lookout

<b>2b</b>	<b>Flying Straight and Level</b>
	The Horizon
	Level flight attitude
	Power, Attitude, Trim
	Balance & Rudder Usage
	Lookout, Attitude, Instruments
	Regaining Straight and Level
	Straight and Level at Different Power Settings

### 1.3.3 Climbing and Descending

<b>3</b>	<b>Climbing and Descending</b>
	Forces of Flight
	Energy Management
	Centre of Gravity, Centre of Pressure, Couples & Moments
	Effect of Flap

### 1.3.4 Medium Level Turns

<b>4</b>	<b>Medium Level Turns</b>
	Forces of Flight
	Lift Vectors
	Adverse Yaw
	Overbanking
	Sight Picture
	Instruments

### 1.3.5 Climbing and Descending Turns

<b>5</b>	<b>Climbing and Descending Turns</b>
	Forces of Flight
	Lift Vectors
	Rate and Angle of Climb

### 1.3.6 Slow Flight

6	<b>Slow Flight</b>
	Lift and Angle of Attack
	Effects of Controls
	Flaps – Types and Effects
	HASELL Checks
	<b>Meteorology</b>
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	Atmospheric Processes
	Standard Atmosphere
	Pressure Systems
	Fronts
	Clouds & Cloud Types
	Thunderstorms

### 1.3.7 Basic Stalling

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	Stall Speed
	Symptoms
	Recovery
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	The Pressure Altimeter
	Altimeter Settings
	Influence of Surface Pressure
	Altimeter Errors
	Calculating QFE and QNH

### 1.3.8 Steep Turns

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	Effect of Bank Angle on Stalling Speed
	Power and Airspeed
	Spiral Dives
MSFS Idiosyncrasies	

**1.3.9 Circuit Introduction**

<b>9</b>	<b>Circuit Introduction</b>
	The Aerodrome Traffic Circuit
	Circuits at Wycombe Air Park
	<b>Takeoff</b>
	Torque
	Slipstream
	Effect of Wind
	Ground Roll & Takeoff Distance
	Climb Angle
	Effect of Flap
	Power
	<b>Landing</b>
	Effect of Wind
	Effect of Flap
	Power
	Braking
	Approach
	Roundout & Flare
	Illusions

**1.3.10 Joining and Leaving the Circuit and Introduction to Navigation**

<b>10</b>	<b>Leaving the Circuit</b>
	Legs of the Circuit
	Leaving the Circuit
	<b>Joining the Circuit</b>
	Approaching the Circuit
	Landing Direction
	Achieving the Circuit Altitude
	Communications

### 1.3.11 Navigation

11	<b>Navigation</b>
	Speeds
	The Magnetic Compass
	Bearings, Heading and Track
	Flight Time
	Drift
	<b>Flight Planning</b>
	Weather
	Weather Minima
	Cloud Base and Ceiling
	NOTAMs
	Restricted and Prohibited Areas
	Danger Areas
	Controlled Airspace
	Selecting Turning Points
	<b>Performance</b>
	Mass
	Payload
	Maximum Takeoff Mass
	Balance
Fuel Consumption and Planning	
Trip Fuel Calculation	
Takeoff and Landing Performance	

### 1.3.12 Glide Approaches

12	<b>Glide Approaches</b>
	Techniques
	Use of Flaps

**1.3.13 Emergencies**

<b>13</b>	<b>Emergencies including Forced and Precautionary Landings</b>
	Causes of Engine Failure
	Forced Landing without Power
	Effect of Height
	Trouble Checks
	Shutdown Checks
	Landing Areas
	<b>Engine Failure after Takeoff</b>
	Rejected Takeoff
	EFATO Actions
	Takeoff Safety Brief

**1.3.14 Bad Weather Circuits**

<b>14</b>	<b>Bad Weather Circuits</b>
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**1.3.15 Short Field Operations**

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	Takeoff Considerations
	Factors Affecting Takeoff Performance
	Takeoff Performance Calculation
	Short Field Takeoff Technique
	Landing Considerations
	Factors Affecting Landing Performance
	Landing Performance Calculation
	Short Field Landing Technique

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## 1.4 Flight Training

### 1.4.1 Detail 1 – Air Experience

Detail 1 Air Experience			
1d	Exercise	Student	Instructor
	Establish Shared Cockpit Connection	✓	✓
	Pre-flight Checks		
	Taxi Out		✓
	Take Off and Route to Training Area		✓
	Primary Effects of Controls: Elevator, Aileron & Rudder		
	Further Effects of Controls: Elevator, Aileron & Rudder		
	Effect of Engine Controls		
	Effect of Flaps		
	Trimming		
	Taxi In	✓	
	Parking	✓	

#### 1.4.1.1 Objectives

- Successfully establish a shared cockpit connection
- Introduce the course, Cessna 172SP aircraft and the concepts and practicalities around dual training in FS
- Operate the primary controls and observe the secondary effects on the aeroplane in flight.
- Operate the ancillary controls and experience the feel and effect on the aeroplane in flight.

#### 1.4.1.2 Session Proficiency Criteria

- To demonstrate an understanding of the primary and further effects of the primary flight controls
- To demonstrate an understanding of the effects of the ancillary controls

### 1.4.1.3 Detail 1 Session Guide

The primary objective of this lesson is to successfully establish the shared cockpit connection and introduce the student to the course, the Cessna 172 and the training methods involved.

It is also a good opportunity to assess the student's general level of knowledge and handling ability in order to plan the progression of future lessons.

Refer to the POH and Flying Club Flying Orders:

#### **Establish shared cockpit connection**

Be prepared for this to take a little time, especially first time round! However, once a connection has been established once, the process during future lessons should usually be much smoother.

Talk the student through the process. Check whether the student has any third-party weather software (e.g. ActiveSky) running prior to establishing the connection. Discuss the potential impact of external weather engines (i.e. weather desynchronization). If weather for the session is going to be set by the instructor through the FS interface (e.g. if the real weather is unsuitable for the detail) emphasise the importance neither party is running any external weather software prior to connection.

Talk the student through the process of connecting to VATSIM in Shared Cockpit Mode:

- Instructor connects as normal using their assigned WYC\*\* callsign
- Student connects in Observer Mode using the same callsign as the instructor but appending "A" (e.g. Instructor WYC51, Student WYC51A)

Note that some FS scrolling aircraft substitution text messages may be experienced: reassure the student that this is normal and has no effect on the session operation.

#### **Pre-flight Checks**

Check that the student has the appropriate documentation to hand:

- Current BAV C172SP Checklist
- Wycombe Air Park ground chart
- Training Area Chart

If the student does not have a particular piece of documentation, reassure them that the session can still go ahead but stress that they must have it ready for the next session.

Establish the student's previous experience, virtual and real.

Establish the student's hardware setup – in particular, do they have a rudder axis available? If so, are they using pedals & toe brakes or a twist joystick? If they do not have a rudder axis available (i.e. are using autorudder), advise them that separate rudder control is essential for successful completion of the course – even if this is using the keyboard.

Talk the student through the pre-flight checks, including an overview of the exterior inspection. Ensure that the student's seating position is correctly adjusted: they should just be able to see the engine cowling over the top of the glareshield.

### Taxi out

Point out lookout limitations due to the aircraft structure and remind the student of the lateral clearance required due to the aircraft's wingspan.

Introduce the student to the airfield layout and point out major features & the directions of north/south/east/west.

Explain the correct taxi procedure and the importance of carrying out a brake check immediately after starting the taxi.

Talk the student through the engine run-up and explain what they are checking for.

### Take off & route to training area

Generally speaking the instructor should take control and demo the takeoff and noise abatement procedures (particularly if runway 06 is active at WAP). Control may be handed over to the student once established en-route to the training area. Point out local landmarks and reference points.

### Effects of controls

#### Flight controls

Ensure the student is looking in the right place (i.e. outside). Discuss nose attitude & the horizon – what is it & how to recognise.

Demonstrate the primary flight controls one at a time and allow the student to practice. It may be beneficial to hold the wings level with aileron during the rudder demonstration in order for the student to properly see the yaw rather than the more obvious roll, but bear in mind that when the controls are swapped you will be unable to provide aileron input to balance the student's rudder inputs.

#### Secondary effects

Emphasise that these secondary effects only occur when the controls are operated on their own.

Aileron – roll, slip, then yaw towards the lower wing

Trim the aeroplane so the aircraft is flying hands-off. Roll with aileron using no backpressure and demonstrate the recovery from the subsequent spiral descent using co-ordinated control inputs. The initial adverse yaw towards the higher wing may be difficult to see.

Rudder – yaw, skid then roll in direction of yaw

Moderate rudder pressure only is required.

#### Airspeed

Maintain constant power and vary airspeed with attitude. Allow the student to experience the feel of the controls at high and low airspeed. Whilst there is no tactile feedback in the simulator, the controls do become noticeably sloppier at low speeds. Emphasise and reinforce verbally: slow airspeed, high nose attitude,

sloppy controls, big control movements needed – high airspeed, low nose attitude, firm controls, small movements needed.

Demonstrate that the controls operate in relation to the pilot, not the horizon: e.g. roll in some bank, pitch the nose up and yaw.

#### Engine Controls

Increase power – aircraft pitches up. The nose may also yaw left due to the effect of slipstream. The opposite is true for reducing power.

Demonstrate the descent first, then apply full power to demonstrate the pitch change. Explain and emphasise that your hands are off the controls: the pitch change is purely down to the change in thrust.

#### Flaps

Lowering flap = lift and drag increase. Point out the white arc and explain limitation – operation – indication.

Trim for straight and level, select flap, note the pitch change, then re-trim. Note that there will be an initial pitch up as the flaps extend, but if airspeed is maintained by adding power the nose attitude will be lower.

#### Trim

Describe method of trimming: hold attitude, trim to relieve pressure. Avoid flying the aeroplane with the trim: after running in trim, gently release the controls and see what happens to the nose: if not correct, reapply pressure to bring the nose back to the right place then trim again and repeat as necessary.

#### **Taxi In**

Discuss use of brakes/differential braking - pros & cons, and how the aircraft steers.

How the aircraft is different on the ground - no airspeed (controls).

#### **Parking**

Where, how, marshalling/docking aids

#### **1.4.1.4 Debrief**

- Point forward to next lesson – straight and level flight – and encourage reading of Moodle briefing material
- Point out - not expecting perfection, just progress
- Encourage the student to ask questions

**1.4.2 Detail 2 – Straight and Level Flight**

<b>Detail 2 Straight and Level Flight</b>			
	<b>Exercise</b>	<b>Student</b>	<b>Instructor</b>
<b>2c</b>	Establish Shared Cockpit Connection	✓	✓
	Pre-flight Checks		
	Taxi Out	✓	
	Take Off and Route to Training Area		✓
	Identify the Horizon		
	Demonstrate Level Flight Attitude		✓
	Straight and Level Flight	✓	
	Regaining Straight and Level		
	Effect of Imbalance		
	Straight and Level at Lower Airspeed		
	Straight and Level at Higher Airspeed		
	Return to Airfield	✓	
	Land		✓
	Taxi In	✓	

**1.4.2.1 Session Proficiency Criteria**

- To demonstrate the ability to establish and maintain straight and level flight, at a constant airspeed, constant altitude, in a constant direction and in balance
- To demonstrate the ability to regain straight and level flight
- To demonstrate the ability to maintain straight and level flight at selected airspeeds or power settings

**1.4.2.2 Preview Item**

- Attitudes for climbing and descending

### 1.4.2.3 Detail 2 Session Guide

Refer to the Cessna 172 POH and BAVirtual Flying Club Flying Orders.

#### **Establish Shared Cockpit Connection**

Talk the student through as necessary. Confirm whether external weather engines are to be used. Connect to VATSIM as appropriate.

#### **Pre-flight Checks**

Allow the student to carry out the pre-flight checks under direction with reference to the checklist. Provide more detailed explanations of procedures as necessary. Emphasise the importance of checklist discipline.

#### **Taxi Out**

The student should taxi out to the holding point. Emphasise the importance of instrument checks and direct them through the run-up procedures as necessary.

#### **Take Off and Route to Training Area**

Talk the student through the takeoff procedure and demonstrate the climbing attitude. En-route to the training area ask the student to point out any landmarks and ground features they recognise.

#### **Identify the Horizon**

Explain the concept of nose attitude and ensure the student is looking in the correct place (i.e. out over the nose).

#### **Demonstrate Level Flight Attitude**

Allow the student to note the attitude when level. Demonstrate an attitude that is too high, and an attitude that is too low.

#### **Straight and Level Flight**

Note five elements and how they can be recognised & confirmed:

- Constant direction (reference point, wet compass, heading indicator)
- Constant altitude (power + attitude, altimeter)
- Constant airspeed (power + attitude, ASI)
- Wings level (glare shield/wingtips vs horizon, ADI)
- Aircraft in balance (balance ball)

To establish/regain straight & level – PAT. Hand over control to student & ask them to maintain straight & level. Introduce LAI scan.

#### **Regaining Straight and Level**

Make minor deviations away from straight and level and talk the student through regaining it.

Demonstrate straight and level flight at different airspeeds and power settings – get student to note change in nose attitude required, and practice maintaining straight and level at different airspeeds.

#### 1.4.2.4 Common Errors

- Focussing too much on instruments
- Incorrect trim technique
- Not correcting small deviations promptly

#### 1.4.2.5 Debrief

- Point towards next lesson – Climbing and Descending
- Ask student to think about attitudes for climbing and descending seen during this flight
- Ask student to learn the relevant speeds for climbing and descending for the next lesson ( $V_X$ ,  $V_Y$ , Best Glide)

### 1.4.3 Detail 3 – Climbing and Descending

Detail 3 Climbing and Descending			
	Exercise	Student	Instructor
3c	Establish Shared Cockpit Connection	✓	✓
	Pre-flight Checks	✓	
	Taxi Out	✓	
	Take Off and Route to Training Area	✓	
	Level off at Selected Altitude	✓	
	Powered Descent		
	Normal Climb		
	Glide Descent		
	V <sub>x</sub> Climb		
	Powered Descent		
	V <sub>y</sub> Climb		
	Return to Airfield	✓	
	Land		✓
	Taxi In	✓	

#### 1.4.3.1 Session Proficiency Criteria

- To demonstrate the ability to enter the climb and the descent from straight and level flight
- To demonstrate the ability to maintain a climb and a descent at a constant speed, in a constant direction and in balance
- To demonstrate the ability to level off at specific altitudes

#### 1.4.3.2 Preview Item

None

### 1.4.3.3 Detail 3 Session Guide

#### Powered Descent

- Initiate powered descent (this is what is done on a normal powered approach to land) - select an attitude and reduce power to predetermined amount and then adjust attitude to maintain speed - which to do first?
- Reduce power = nose down couple (why?) and gives more controlled action, so do first
- Regaining straight & level requires same actions for same reasons, so power again first
- Once settled in straight & level pupil to repeat full descent exercise
- Demonstrate then practise effect of flap on descent rate and angle

#### Climb

- Demonstrate climb - power increase first to full power, then adjust attitude using horizon, cross-checked with ADI. If attitude is adjusted first, speed loss occurs. Attitude is then adjusted to maintain speed. Level off at predetermined altitude (once a steady climb has been maintained). Now change attitude first to maintain level flight (or speed loss would again occur) and reduce and adjust power to maintain speed
- Student to repeat full climb exercise
- Demonstrate and practice the effect of flap extension and retraction on climb performance, attitude and speeds

#### Idle Power Descent

- Initiate idle power descent - select an initial attitude and reduce power to idle and then adjust attitude to maintain speed - which to do first?
- Reduce power = nose down couple (why?) and gives more controlled action, so do first, lowering nose as power reduces
- Regaining straight & level means once again power up leads attitude adjustment
- Effect of speed on flight controls - loss of sensitivity at slow speed = warning sign!

#### $V_x$ and $V_y$ Climbs

- Ask student what the speeds for  $V_x$  and  $V_y$  climbs are
- Practice climbing at  $V_x$  and  $V_y$ . Note different attitudes and rates of climb
- Ask student when it would be useful to use these speeds
- Why don't we always climb at  $V_x$  or  $V_y$ ? (Engine cooling, lookout considerations, forward progress etc)

### 1.4.3.4 Common Errors

- Reducing power as first action when levelling off from a climb (i.e. before airspeed has built up)
- Insufficient anticipation of target altitude
- Drifting off track when climbing or descending
- Insufficient/incorrect use of rudder pressure to compensate for asymmetric blade effect during climbs

#### 1.4.3.5 Debrief

- Ask student what they learnt about effect of power changes and flap setting on climb/descent performance
- Point towards next lesson – medium level turns

**1.4.4 Detail 4 – Medium Level Turns**

<b>Detail 4 Medium Level Turns</b>			
	<b>Exercise</b>	<b>Student</b>	<b>Instructor</b>
<b>4c</b>	Establish Shared Cockpit Connection	✓	✓
	Pre-flight Checks	✓	
	Taxi Out	✓	
	Take Off and Route to Training Area	✓	
	Turn to the Left	✓	
	Turn to the Right		
	Return to Airfield	✓	
	Land		✓
	Taxi In	✓	

**1.4.4.1 Session Proficiency Criteria**

- To demonstrate the ability to change direction through 360 degrees at a constant rate using 20 degrees angle of bank, whilst maintaining a constant altitude and keeping the aeroplane in balance

**1.4.4.2 Preview Item**

- Climbing and descending turns – demonstrate relevant nose attitude and explain the need to limit bank angle in climbing turns

#### 1.4.4.3 Detail 4 Session Guide

##### Turn to the Left

- Demonstrate turn to left at 20 degs bank - talk through picture of horizon/coaming relationship - talk about increase in 'back pressure' on elevator to prevent aircraft nose dropping - all must be coordinated, so anticipation is required. Show what happens if controls are released - very different to trimmed straight & level flight (do we trim in a turn? - discuss)
- Patter: "Roll in with left aileron, balance with left rudder" (etc).
- Return aircraft to straight & level flight showing what happens when return is initiated at desired heading - it overshoots beyond the target heading, so anticipation is needed. Point out need to use rudder to properly maintain balance when rolling out
- Explain overbanking tendency and need to 'hold off' bank with opposite aileron
- Pupil to repeat turn to the left

##### Turn to the Right

- Demonstrate turn to right at 20 degs bank - talk through different picture of horizon/coaming relationship - show again increase in power needed or speed falls - repeat talk about increase in 'back pressure' on elevator to prevent aircraft nose dropping - all must be coordinated, so anticipation is required.
- Return aircraft to straight & level flight showing anticipation now used to finish turn on target heading
- Point out overbanking tendency and need to 'hold off' bank with opposite aileron
- Pupil to repeat turn to the right exercise, followed by regaining straight & level

##### Return to Airfield

- Return to airfield with pupil doing most of the flying using new skills
- Land - instructor to talk through use of skills as instructor completes final approach and landing
- Taxi in

#### 1.4.4.4 Common Errors

- Not looking outside to judge correct attitude & bank angle
- Allowing aircraft to overbank as a result of no/insufficient application of opposite aileron to 'hold off' bank once established in turn
- Overshooting target heading
- Inconsistent bank angle
- Climbing at start of turn due to excessive backpressure
- Climbing during roll-out of turn due to not releasing backpressure
- Incorrect use of rudder when rolling out (balance not maintained)

#### 1.4.4.5 Debrief

- Ask student to think about attitudes for turns seen during this flight
- Point towards next lesson – Medium Climbing and Descending Turns

**1.4.5 Detail 5 – Medium Climbing and Descending Turns**

<b>Detail 5 Medium Climbing and Descending Turns</b>			
	<b>Exercise</b>	<b>Student</b>	<b>Instructor</b>
<b>5b</b>	Establish Shared Cockpit Connection	✓	✓
	Pre-flight Checks	✓	
	Taxi Out	✓	
	Take Off and Route to Training Area	✓	
	Turn to the Left	✓	
	Turn to the Right	✓	
	Return to Airfield	✓	
	Land	✓	
	Taxi In	✓	

**1.4.5.1 Session Proficiency Criteria**

- To demonstrate the ability to complete a medium turn while climbing
- To demonstrate the ability to complete a medium turn while descending

**1.4.5.2 Preview Item**

None

### 1.4.5.3 Detail 5 Session Guide

- Student taxies out
- Introduce instrument check & continue to involve student in checklists
- Introduce radio work -- e.g. call ready for departure & respond to clearance
- Take off
- Recap climbing & descending & straight & level flight on way to training area
- Recap adverse yaw & level turns

#### Climbing Turns

- Ask student to enter a climb: demonstrate attitude for climbing turns
- Sight line difference between left & right turns
- Nose appears higher in a left turn due to sight line
- Nose is higher anyway -- climbing turn
- Ask student to enter a descent: demonstrate attitude for descending turns
- Ask student to enter a climbing left turn at 10-15 degrees of bank
- Recover to straight & level

#### Descending Turns

- Ask student to enter descending left turn at 20 degrees of bank
- Recover to straight & level

#### Consolidate

- Climb/descend to a specified altitude & turn to roll out on a ground feature or compass heading
- Student should complete manoeuvres at a different altitude & heading from where they started
- Look for co-ordinated entry & exit – pitch & roll together

#### Return to airfield

- Practice different descents & descending turns
- Discuss joining the circuit & radio calls -- student may be comfortable enough to fly in the circuit under direction

#### Land

- Student taxies in & parks

### 1.4.5.4 Debrief

- Point towards next lesson - Slow Flight
- Ask what sort of attitude they would expect to see if flying slower than normal
- Encourage further reading

**1.4.6 Detail 6 – Slow Flight**

<b>Detail 6 Slow Flight</b>			
	<b>Exercise</b>	<b>Student</b>	<b>Instructor</b>
<b>6b</b>	Establish Shared Cockpit Connection	✓	✓
	Pre-flight Checks	✓	
	Taxi Out	✓	
	Take Off and Route to Training Area	✓	
	HASELL Checks		✓
	Slow Flight (Clean)	✓	✓
	Slow Flight (With Flap)	✓	✓
	Go Around Simulation	✓	
	Return to Aerodrome	✓	
	Land	✓	
	Taxi In	✓	

**1.4.6.1 Session Proficiency Criteria**

- To slow the aeroplane and maintain straight and level flight at low airspeed (1.2  $V_s$ )
- To maintain straight and level flight at low airspeed in various configurations
- To maintain a constant altitude whilst turning at low airspeed
- To return to normal operating airspeeds

**1.4.6.2 Preview Item**

- If time permits, demonstrate stall entry and recovery

### 1.4.6.3 Detail 6 Session Guide

- Student taxies out
- Student takes off
- Route to training area; revise straight & level. Re-emphasise horizon picture over coaming when trimmed for straight & level flight. Practice climbing & turning.
- HASELL Checks
  - Height/Airframe/Security/Engine/Location/Lookout
  - Height – sufficient to recover (see Flying Orders for manoeuvre-specific requirements)
  - Airframe – flaps up
  - Security – harnesses & hatches secure, no loose objects
  - Engine – Ts & Ps in the green, mixture full rich
  - Location -- clear of **A, B, C** and **D**:
    - Active airfields
    - Built-up areas
    - Controlled airspace
    - Danger areas
  - Lookout – either two 90 degree turns (one left/one right), or one 180 degree turn. Emphasise that the most important thing is to look out rather than concentrate on completing a perfect 90/180 degree turn.

#### Slow Flight

- Demonstrate entry to slow flight with & without flaps (airspeed: 1.2Vs = 50kias (landing config) 60kias (clean))
- Student to practice after each demonstration
- Allow student to regain normal cruise
- Demonstrate turning -- including reversing turn direction -- max 15 AOB
- Establish aircraft in approach configuration at 60kias. Then establish in climb (go-around simulation).

#### Return to Aerodrome

- Introduce further radio work & talk through rejoining circuit

### 1.4.6.4 Common Errors

- Overbanking in turns
- Loss/gain of altitude when entering or leaving slow flight
- Insufficient rudder pressure to maintain balance & keep straight due asymmetric blade effect

### 1.4.6.5 Debrief

- Next lesson: Basic Stalling
- Checklists - ask student to try and memorise responses ahead of next lesson

**1.4.7 Detail 7 – Basic Stalling**

Detail 7 Basic Stalling			
	Exercise	Student	Instructor
7b	Establish Shared Cockpit Connection	✓	✓
	Pre-flight Checks	✓	
	Taxi Out	✓	
	Take Off and Route to Training Area	✓	
	HASELL Checks	✓	
	Stalling Demonstration		✓
	Full Stall and Recovery	✓	
	Recovery at Onset	✓	
	Return to Aerodrome	✓	
	Land	✓	
	Taxi In	✓	

**1.4.7.1 Session Proficiency Criteria**

- To control the aeroplane to the point of stall, recognise the symptoms of the approaching stall, experience the stall itself and recover with minimum height loss
- To control the aeroplane to the point of stall, recognise the symptoms of the approaching stall, and recover at stall onset with minimum height loss

**1.4.7.2 Preview Item**

None

### 1.4.7.3 Detail 7 Session Guide

- Revise HASELL checks (prior to first stall)
- Introduce HELL checks (between each subsequent stall)
- Revise requirement for smooth but positive throttle movements
- Student taxies out
- Encourage more radio work
- Run through checklists & ensure student is learning responses
- Student takes off. On the way to the training area there are opportunities to practice climbing, straight & level flight, and turning

#### Demonstrate

- Complete HASELL checks
- Set the aircraft up & choose reference point into or with the wind to reduce problems with drift perception. Confirm reference point with DI. Nominate a reference altitude
- From level flight, smoothly close the throttle
- Keep straight with rudder & hold altitude with increasing backpressure on control column
- Slow down entry so that patten can be synchronised to each of the symptoms as they appear (official stall entry deceleration is 1 knot per second)
- Inform student that in order to give them a good look at each of the symptoms, no attempt will be made to maintain a constant altitude during this entry
- Adjust back-pressure to synchronise patten to match symptoms
- Point out stall warning symptoms:
  - Decreasing airspeed
  - Less effective controls & progressively increasing stick forces
  - Stall warning device
- Usually follows reduced control effectiveness but not always -- device is mechanical and may not work
- C172 has a pneumatic stall warner - inlet on left wing leading edge ducted to horn near top left of instrument panel. As the aircraft approaches the stall, low pressure on top of the wing sucks air through the horn & produces audible warning (usually 5-10 kts above stall).
- Buffet -- caused by turbulent airflow from the wings striking the empennage
  - Least noticeable in high wing types e.g. C172
- At this point elevator effectiveness reduced to the point where no further increase in AoA may be achieved by elevator alone.
- Aircraft sinks & change in relative airflow causes critical AoA to be exceeded
- Aircraft stalls, altitude decreases & nose pitches down
- Strong nose-down pitch moment in FSX C172
- Important for the student to correctly identify when the aircraft has stalled
- Observe nose-down pitch at stall & carry out normal recovery without patten

#### Recovery

- Unstall the aircraft
- Reduce the AoA
- Check forward with the control column
- Smooth but positive control movement
  - Not much required in FSX C172

- Hold ailerons centralised
- Reducing AoA is all that is necessary to unstall the aircraft
- Straight & level may now be regained from the descent (using PAT)
- Altitude loss will be ~300ft

**To minimise the altitude loss**

- Power + Attitude = Performance
- For least loss of altitude, the maximum amount of power is required
- AFTER unstalling the wing:
  - Smoothly but positively apply full power
  - Keep straight using rudder
  - Raise nose smoothly to the horizon
- No need to hold the nose down: excessive altitude will be lost
- Increasing back-pressure too rapidly or jerking may cause a secondary stall
- Nose on the horizon used as reference attitude
- Compromise between arresting sink & allowing aircraft to accelerate to nominated climb speed
- Discourage student from thinking that pulling back will make the aircraft stop sinking -- that's how the stall was entered.
- State expected altitude loss -- e.g. not more than 100 ft
- Hold aircraft in nose-on-horizon attitude until climb speed is reached, then select climb attitude
- Regain straight & level flight at starting altitude & regain reference point/heading if necessary.
- Ask student to identify nose-high attitude

**Recovery at onset**

- Emphasise that under normal conditions the stall is avoided
- Recover at onset: i.e. at the stall warning or buffet
- Expected altitude loss from recovery at onset should be stated -- e.g. less than 50 ft

**1.4.7.4 Common Errors**

- Attempting to pick up dropped wing with aileron
- Allowing nose to drop too far below the horizon resulting in excessive altitude loss
- Not entering the stall in balance

**1.4.7.5 Debrief**

- Remind student that there will be plenty of opportunity to practice stalling, but primary objective is to recognise the stall & avoid inadvertent stall
- Encourage student to continue learning checklists
- Point towards next lesson – steep turns

**INTENTIONALLY BLANK**

**1.4.8 Detail 8 – Steep Turns**

<b>Detail 8 Steep Turns</b>			
	<b>Exercise</b>	<b>Student</b>	<b>Instructor</b>
<b>8b</b>	Establish Shared Cockpit Connection	✓	✓
	Pre-flight Checks	✓	
	Taxi Out	✓	
	Take Off and Route to Training Area	✓	
	HASELL Checks	✓	
	Steep turn to the left	✓	✓
	Steep turn to the right	✓	✓
	Spiral dive recognition and recovery	✓	✓
	Return to Aerodrome	✓	
	Land	✓	
	Taxi In	✓	

**1.4.8.1 Session Proficiency Criteria**

- To change direction through 360 degrees at a constant rate, using 45° angle of bank, maintaining a constant altitude and in balance
- To become familiar with the sensations of high bank angles and high rates of turn
- To recognise and recover from a spiral dive

**1.4.8.2 Preview Item**

- The aerodrome traffic circuit – discuss positioning, circuit legs and altimetry

### 1.4.8.3 Detail 8 Session Guide

- Ensure the student is aware of and can recognise the 45° and 60° bank angle markings on the ADI, but emphasise that the desired angle of bank is recognised through attitude with respect to the horizon and simply confirmed using the instruments.
- Complete HASELL checks.
- Discuss and demonstrate the effect of side-by-side seating on attitude recognition.
- Begin with a standard turn, followed by a 30° banked turn, then a 45° banked turn, and finally try a 60° banked turn. It is recommended that turns be completed through 360° using a suitable reference point or compass heading.
- A power increase of approximately 100-200rpm will be required in order to maintain airspeed and should be smoothly added in co-ordination with the turn entry.
- Altitude should be maintained using backpressure, provided the angle of bank is correct. If altitude is being gained or lost, first check angle of bank. If angle of bank is correct, adjust backpressure to maintain constant altitude.
- The emphasis here is on establishing the correct angle of bank in order to prevent the onset of a spiral dive.

### Spiral Dive Recognition & Recovery

- A word of warning! The default Cessna 172 does NOT perform exactly like the real aircraft at the extremes of bank angles attempted here. In the FSX default C172 aircraft you can end up with 60° of bank with the nose attitude about 2° nose up at about 110 kts IAS – but with the aircraft descending rapidly. This is a spiral dive with a difference – the nose of the aircraft remains above the horizon, and no further back elevator control is available to counter the descent! The only way to recognise this condition is to keep the VSI always within your instrument scan. Once recognised:
  - Throttle to idle
  - Level the wings
  - Gently ease out of the dive
  - Re-establish level flight as required
  - Note that the aircraft's structural limitations are reduced by 1/3 if manoeuvring in more than one plane: this is the reason for rolling the wings level before easing out of the dive.
- Although perhaps not entirely “as real as it gets”, the exercise is nevertheless excellent in teaching the importance of a good instrument scan. It also illustrates how dangerous situations can creep up unexpectedly – a very real problem.

### 1.4.8.4 Common Errors

- Not maintaining bank angle accurately
- Gain of height whilst rolling out of the turn
- Overshooting target heading
- Looking “inside” at instruments too much

### 1.4.8.5 Debrief

- Debrief salient points
- Point towards next lesson: Circuit Introduction

**1.4.9 Detail 9 – Circuit Introduction**

<b>Detail 9 Circuit Introduction</b>			
	<b>Exercise</b>	<b>Student</b>	<b>Instructor</b>
<b>9d</b>	Establish Shared Cockpit Connection	✓	✓
	Pre-flight Checks	✓	
	Taxi Out	✓	
	Circuits	✓	✓
	Land	✓	
	Taxi In	✓	

**1.4.9.1 Session Proficiency Criteria**

- To take off and follow published procedures that conform to the aerodrome traffic circuit, avoiding conflict with other aircraft
- To carry out an approach and landing using the most suitable runway

**1.4.9.2 Preview Item**

None

### 1.4.9.3 Detail 9 Session Guide

- Ideally at this introductory stage each circuit should be flown to a full stop & aircraft taxied back to the holding point for another takeoff
- If this is not convenient (e.g. due traffic) then consider briefing touch & go procedure
- If a go-around is required it is recommended you take control & pattern the procedure
- Demonstrate ideal circuit first, then talk student around

#### Takeoff

- On lining up allow aircraft to roll forward a short distance on the centreline to ensure nosewheel is straight & aligned with centreline
- Once on runway the aircraft is held on foot brakes (if required) - never park brake
- With application of full power for takeoff forgetting to release park brake may not be noticed
- Keep straight with rudder
- Temps/pressures/RPM/airspeed should be checked for normal readings
- At rotate speed -- use elevator back-pressure to take weight off nosewheel as aircraft accelerates
- Aim to reduce loads on nose-wheel & reduce friction
- As the aircraft accelerates it will fly off in a slightly nose-high attitude & accelerate rapidly to nominated climb speed (80 kias)
- Adjust pitch attitude until reaching climb speed, then adjust climb attitude to maintain speed & then trim

#### Climb out

- Separation from other aircraft achieved on this leg
- Ground-speed usually at a minimum (headwind usually strongest in this direction)
- Turn on to crosswind -- not below 500ft aal
  - At Booker, not before rectangular woods off 24
  - Modify based on other traffic
- After takeoff/climbout checks -- not less than 300ft
- Check appropriate ground track is being maintained

#### Crosswind

- Note Booker idiosyncrasies
- Stress lookout before starting turn - choose reference point (Stokenchurch Mast off 24)
- Allow for drift

#### Downwind

- Note Booker idiosyncrasies
  - Lane End & Frieth on right, Golden Ball well left of track
- Lookout before starting turn - beware aircraft joining on downwind
- Beware also aircraft transiting along Hambleden Valley - circuit extends outside of ATZ
- Call "downwind" abeam upwind threshold & include intentions
  - "Late downwind" if any later

- If ATC advise position in circuit - make positive effort to search for & identify preceding aircraft by scanning from threshold back along base & downwind leg, counting off aircraft as you see them
- Note position where runway “cuts” strut

#### Base

- Lookout
- Approximately 45 degrees to threshold: reduce power, begin level turn, reduce airspeed toward white arc
- Once in white arc - select 10 degrees of flap & trim to maintain nominated descent speed
- Select power setting based on assessment of downwind spacing vs runway
  - 1500rpm as a guide - increase or reduce if wide/tight
- Continue turn until leading edge of wing/strut is parallel with runway (allowing for drift)
- Once established on base: select 20 degrees of flap & trim to maintain nominated approach airspeed
- Emphasise lookout before turn to final
- Ensure no other aircraft are on long final

#### Final

- Judge turn to roll out aligned with the centreline
- Approach airspeed should be maintained by adjusting attitude
- Select full flap once established on final
  - **NOT** during final turn!
- Monitor approach path with reference to aim point
- Adjust power to maintain steady rate of descent

#### Landing

- Two phases: round-out & hold-off
- Once landing assured (c. 50ft) - throttle closed & nose progressively raised
- As airspeed decreases aircraft will begin to sink
- Look at far end of runway/horizon to judge sink
- Gradual increase in backpressure to control rate of sink & achieve correct attitude so that touchdown is light & on main wheels only
- Gently lower nosewheel by relaxing backpressure
- Keep straight using rudder & apply brakes as required
- Complete after landing checks once clear of runway

#### 1.4.9.4 Common Errors

- Incorrect judgement of height/glidepath
- Overbanking in base -> final turn
- Centreline tracking on takeoff

#### 1.4.9.5 Debrief

- Encourage student to continue learning checklists

- Point towards next lesson - joining/leaving & navigation

#### 1.4.10 Detail 10 – Joining and Leaving the Circuit and Introduction to Navigation

Detail 10 Joining and Leaving the Circuit and Introduction to Navigation			
	Exercise	Student	Instructor
10c	Establish Shared Cockpit Connection	✓	✓
	Pre-flight Checks	✓	
	Taxi Out	✓	
	Leave Circuit	✓	
	Return and Rejoin	✓	
	Depart to Oxford	✓	
	Standard Overhead Join	✓	
	Touch and Go	✓	
	Return to Booker	✓	
	Land	✓	
	Taxi In	✓	

##### 1.4.10.1 Session Proficiency Criteria

- To vacate and join the circuit in accordance with applicable procedures
- To join an uncontrolled circuit in accordance with the standard overhead join procedure

##### 1.4.10.2 Preview Item

- Navigation principles – altimetry, plog, timing

**1.4.10.3 Detail 10 Session Guide**

- Student - start up, taxi out & take off
- Leave circuit by briefed route
- Return & rejoin from that position
- Touch & go - depart circuit on briefed route to another aerodrome
- Join the circuit there
- Go around from low altitude
- Repeat with touch & go
- Return to Booker -- with different rejoin

**1.4.10.4 Common Errors**

- Failure to consider appropriate altimeter setting
- Incorrect positioning for standard overhead join

**1.4.10.5 Debrief**

**1.4.11 Detail 11 – Navigation Exercise**

Detail 11 Navigation Exercise			
	Exercise	Student	Instructor
<b>11d</b>	Establish Shared Cockpit Connection	✓	✓
	Pre-flight Checks	✓	
	Taxi Out	✓	
	Navigation	✓	✓
	Land	✓	
	Taxi In	✓	

**1.4.11.1 Session Proficiency Criteria**

- To complete all elements of VFR planning for the route prescribed with particular reference to planned altitudes and safe levels of operation
- To identify position visually by reference to ground features and map
- To navigate by means of calculated headings, ground speed and time
- To complete all necessary checks and drills
- To adjust and monitor fuel consumption for range or endurance as appropriate
- To obtain and comply with ATC clearances and appropriate level of service as necessary

**1.4.11.2 Preview Item**

- Glide approach on return WAP if time, ATC and student confidence/workload permits

### 1.4.11.3 Detail 11 Session Guide

- Student starts up, taxies out, takes off.
- Leaves circuit via briefed route
- Navigates to destination
- Consider taking control to enable student to look outside for landmarks
- Scanning -- instruments, outside, landmarks, traffic, communications
- Student updates plog - ask them to keep you updated on where we are?
- Introduce FREDA
- Full stop landing at destination
- Return

### 1.4.11.4 Common Errors

Note that there is a lot to think about in this session and students may quickly become overwhelmed, especially if they get behind the aeroplane.

- Incorrect altimeter setting
- Failure to accurately maintain track/compensate for crosswinds
- Forgetting to re-align DI with magnetic compass

### 1.4.11.5 Debrief

**1.4.12 Detail 12 – Approach to Landing with Idle Power (Glide Approach)**

Detail 12 Approach to Landing with Idle Power (Glide Approach)			
	Exercise	Student	Instructor
<b>12b</b>	Establish Shared Cockpit Connection	✓	✓
	Pre-flight Checks	✓	
	Taxi Out	✓	
	Circuit to Base Leg	✓	
	Glide Approach	✓	✓
	Repeat until Consistent	✓	
	Land	✓	
	Taxi In	✓	

**1.4.12.1 Session Proficiency Criteria**

- To select and achieve the appropriate touchdown area at the recommended speed
- To adjust descent and roundout (flare) to achieve a safe landing with little or no float with appropriate drift and crosswind correction
- To fly the aircraft at best glide speed
- To recognise and take appropriate action when the aircraft is too high or too low during a glide approach

**1.4.12.2 Preview Item**

None

### 1.4.12.3 Detail 12 Session Guide

- Fly circuit to base leg and decide on idle throttle point
- Will need to turn base earlier than usual – e.g. about half the normal distance
- Concentrate on maintaining best glide speed -- nail the speed, then look to see where the aim point is moving
- Use flap in stages to steepen glide path as necessary – remember to adjust pitch to maintain best glide with flap extension (i.e. nose will have to pitch down)
- Note the unusual runway perspective and steeper than usual glide path. This will appear very unusual to the student at first.
- Repeat, learning to assess & adjust until consistent performance is achieved

Consider other traffic in the circuit and safety of operation; allow the student every opportunity to recognise a developing situation (e.g. too low) on their own but be prepared to take over/instruct a go-around if necessary.

### 1.4.12.4 Common Errors

- Fixating on keeping the aiming point fixed in the windscreen and thus relinquishing control over airspeed

### 1.4.12.5 Debrief

### 1.4.13 Detail 13 – Emergencies including Forced and Precautionary Landings

Detail 13 Emergencies including Forced and Precautionary Landings			
	Exercise	Student	Instructor
13b	Establish Shared Cockpit Connection	✓	✓
	Pre-flight Checks	✓	
	Taxi Out	✓	
	HASELL checks	✓	
	Practice Forced Landing	✓	✓
	Land	✓	
	Taxi In	✓	

#### 1.4.13.1 Session Proficiency Criteria

- Recognises engine failure and establishes best glide speed
- Carries out trouble checks by recall promptly and correctly
- Simulates emergency transmission using correct phraseology
- Selects appropriate landing area
- Demonstrates a planned and structured glide approach to a position from which a safe landing would be assured
- Carries out correct shutdown checks by recall
- Carries out appropriate go-around action when directed

#### 1.4.13.2 Preview Item

None

### 1.4.13.3 Detail 13 Session Guide

- Start up/taxi out
- Take off & fly to training area
- Demonstrate engine failure & forced landing
- HASELL checks
- Immediate actions
  - Nose down & establish best glide speed
  - Establish landing area
- Trouble checks
  - Is prop turning?
  - Fuel - selector ON/pump ON/change tanks
  - Mixture - full rich/carb heat hot/primer locked
  - Ignition -- check on (L/R/Both)
- Shutdown checks - minimise risk of fire -- if time:
  - Fuel - OFF (pump/tank selector)
  - Mixture - IDLE CUT OFF
  - Ignition - OFF
  - Master switch -- OFF (once Mayday called & final landing flap selected)
- Select reference points & heights
  - Work backwards from landing area
  - Choose aiming point  $\frac{1}{3}$  way in to field
- 1000ft agl area
  - 90 degrees to the threshold  $\sim\frac{3}{4}$  of normal circuit distance out
- On downwind
  - 1500ft agl area
- Further back from 1000ft area
  - Area from which it should be possible to glide to the 1000ft area and arrive at 1000ft agl
- Airfield should remain  $\sim 20$  degrees below the horizon from this point on
  - If you keep this angle constant -- you will make the airfield
- Base turn -- can be adjusted but never extend 1000ft area downwind
- Reference aim point
- Offset drift
- Use flap in stages to bring landing point back towards threshold from aim point
  - Only select landing flap when landing guaranteed



**1.4.14 Detail 14 – Engine Failure After Takeoff**

Detail 14 Engine Failure After Takeoff			
	Exercise	Student	Instructor
<b>13d</b>	Establish Shared Cockpit Connection	✓	✓
	Pre-flight Checks	✓	
	Taxi Out	✓	
	RTO	✓	
	Taxi out	✓	
	EFATO	✓	
	Circuits as required	✓	
	Taxi In	✓	

**1.4.14.1 Session Proficiency Criteria**

- Reacts to engine failure after takeoff by promptly and positively lowering the nose
- Establishes best glide speed
- Selects and identifies a suitable landing area
- Demonstrates a planned approach such that a safe touchdown within the identified landing area would be assured
- Simulates emergency transmission using correct phraseology
- Carries out shutdown checklists from recall as appropriate
- Carries out appropriate go-around action when directed.

**1.4.14.2 Preview Item**

#### 1.4.14.3 Detail 14 Session Guide

- Start up/taxi out
- Run through takeoff safety brief
- RTO

##### Taxi back to start of runway

- Discreetly gain approval from ATC for Fanstop prior to departure e.g. by private message
- Fail engine between 500-600ft
  - Simulate failure by closing throttle – call “simulating”.
  - Call “Fanstop” to ATC or UNICOM (ATC response should be: “report climbing away”)
- Watch for student forgetting to push nose down
- Select a field – within the windscreen
- Once nose has been lowered, landing site selected & flap considered or selected -  
- objective has been achieved & instruction to go around should be given
- Only once competence is high should trouble/shutdown checks be introduced
- Pushing nose down must become immediate & instinctive
- Circuits can be flown for further practice of both EFATO and other circuit work (e.g. glide, flapless) as required

#### 1.4.14.4 Debrief

- Review salient points
- Ask student to think about takeoff safety brief ahead of next lesson
- Discuss possibility of e.g. landing ahead on remaining runway if sufficient – consider navex to airfield with suitable runway for demonstration

**1.4.15 Detail 15 – Bad Weather Circuits**

<b>Detail 15 Bad Weather Circuits</b>			
	<b>Exercise</b>	<b>Student</b>	<b>Instructor</b>
<b>14b</b>	Establish Shared Cockpit Connection	✓	✓
	Pre-flight Checks	✓	
	Taxi Out	✓	
	Low level navigation	✓	
	Return to airfield	✓	
	Bad weather circuits	✓	
	Land	✓	
	Taxi In	✓	

**1.4.15.1 Session Proficiency Criteria**

- Understands the purpose of carrying out a bad weather circuit
- Configures aircraft correctly for operation in poor visibility
- Can fly consistent bad weather circuits at 600ft aal in accordance with standard operating procedures

**1.4.15.2 Preview Item**

### 1.4.15.3 Detail 15 Session Guide

- Student to taxi out and take-off as normal in good, but cloudy, weather conditions
- Checklist and radio work should be attaining a good standard by now
- Depart circuit to suitable training area at a normal altitude for navigating. Point out ability to map read and check navigation at this altitude.
- Descend to lower altitude of 1,000 feet and show increased difficulty of map-reading. Explore sensations of turning at this lower altitude and necessity of monitoring instruments.
- Change weather to reduced visibility, say 5 kms (VMC conditions limit). Re-explore sensations when turning and the change to map-reading ability.
- Descend to bad weather circuit height of 600 feet. Re-explore turning and map-reading.
- Set approach flaps but maintain airspeed. Note the lower nose attitude required, compared to no flaps set, to maintain altitude. Now reduce speed to approach flaps minimum safe speed - is nose lower or higher than before? Which is better for navigation?
- Pick a 'line' feature (road, river or railway on the ground), preferably into wind, and fly along it. Now, at a visible feature (e.g. a bridge) on the line feature turn onto a 'downwind' heading. Start the stopwatch and time 30 seconds. Turn, in the same direction, back onto the upwind heading as previously held (maintaining altitude) and then find and follow the line feature. Start stopwatch again. Time until visible feature is reached and note time on stopwatch. Compare with the 30 seconds held on downwind leg. The difference is the wind effect on the ground speed of the aircraft. Point out relevance to student of this exercise to the bad weather circuit. (repeat if necessary).
- Return to departure airfield and join for bad weather circuit. Prepare aircraft configuration and complete checks as briefed. Join downwind keeping airfield in sight at about 1 nm from runway. Remember to make all the normal radio calls. Complete first circuit maintaining 600 ft aal.
- Repeat circuit this time descending on final to wave-off height of 50 ft aal.
- Repeat circuit to a touch and go landing (reminding student this is only a practice detail and would NOT be done in real world).
- Repeat circuit to a full-stop landing.

### 1.4.15.4 Debrief

**1.4.16 Detail 16 – Short Field Operations**

Detail 16 Short Field Operations			
	Exercise	Student	Instructor
<b>15b</b>	Establish Shared Cockpit Connection	✓	✓
	Pre-flight Checks	✓	
	Taxi Out	✓	
	Performance Takeoff	✓	
	Circuit	✓	
	Precision Landing	✓	
	Circuits as required	✓	
	Taxi In	✓	

**1.4.16.1 Session Proficiency Criteria**

- Consistently able to carry out a Performance Takeoff according to the documented technique
- Applies rudder correctly to ensure aircraft tracks straight during takeoff
- Climbs at  $V_x$  to Obstacle Clearance Height followed by acceleration to  $V_y$
- Able to consistently demonstrate use of the POH precision (short field) landing technique
- Lands consistently in the designated touchdown zone at the correct airspeed

**1.4.16.2 Preview Item**

None

### 1.4.16.3 Detail 16 Session Guide

#### Takeoff brief

- Short field takeoff - in event of EFATO, nose must be immediately and positively lowered due to the slower than normal speed and higher than usual nose attitude
- Discuss decision making
- Discuss checking required static RPM is achieved before brake release (stated in POH) - if RPM is not sufficient, required performance cannot be achieved -- abort takeoff & take aircraft to the shop!
- State Obstacle Clearance Altitude
- Vary this during subsequent exercises to simulate clearing obstacles in takeoff path

#### Taxi out

#### Short field takeoff

- Takeoff safety brief - emphasise positive check forward in event of EFATO
- Use full runway length
- Ensure nosewheel is straight
- Hold aircraft on footbrakes
- Apply full power
- Check static RPM, Ts & Ps
- Release brakes
- As soon as aircraft starts to roll, use elevator to lighten nose wheel
- Reduces friction
- Check for normal acceleration
- Hold nosewheel on ground until Vr - adjust backpressure as airspeed increases
- Rotating early increases aerodynamic drag & prolongs takeoff roll
- At Vr, smoothly rotate & lift off -- avoid "hauling" into the air
- Accelerate to Takeoff Safety Speed
- Note more rudder than usual will be required to keep straight - high power/low speed
- At safe height - accelerate to Vy
- Raise flap: FIRST check:
  - Safe height
  - Safe airspeed
  - Positive rate of climb
  - Trim to maintain climb speed/attitude

Do not allow student to round speeds to nearest mark on ASI -- accurate flying is essential

- Fly circuit to downwind
- Confirm approach & threshold speeds
- Select aim point
  - Should be as close to threshold as possible (consider obstacles on approach)
  - Just short of the numbers
- Delay base turn slightly -- extend downwind to ensure power will be used throughout
- Low threshold speed means elevator effectiveness may be reduced - carrying some power in to the flare ensures elevator effectiveness is sufficient to complete the flare
- Monitor approach path with reference to the aiming point
- Adjust power to maintain steady rate of descent to touchdown

Select full flap on final

- Airspeed progressively decreased once established with full flap to achieve target threshold speed no later than 200ft agl
- If aircraft not correctly configured - on centreline, on correct glidepath, at threshold speed & aim point identified - go around
- Ensure glidepath is same as normal - should not be flat & low, only difference is lower speed (& higher nose attitude)

Do not allow the student to round the approach or target threshold speeds to the nearest mark on the ASI -- accurate flying is important

- Landing completed in one phase - combine round-out & hold-off in to flare
- Reduce rate of descent to zero as main wheels touch & throttle closed
- Lower nosewheel & apply brakes immediately
- Use elevator backpressure to keep weight off nosewheel
- Do not use excessive braking
- Raise flap on completion of landing roll

A full stop landing should always be completed when carrying out this exercise.

If the student picks up the proper techniques quickly, good use should be made of the available time to practice other skills either in the circuit or general airwork in the training area in preparation for the skills test.

#### 1.4.16.4 Debrief

Remind the student they will have plenty of opportunity to practice these landings during their circuit flights.

**1.4.17 Detail 17 – Qualifying Cross Country Flight**

Detail 17 Qualifying Cross Country Flight			
	Exercise	Student	Instructor
16a	QXC	✓	✓

**1.4.17.1 Session Proficiency Criteria**

The Qualifying Cross Country flight is a mandatory requirement of the VATSIM P3 rating. It must be completed solo and conform to the criteria stated in the VATSIM P3 Rating Syllabus, namely:

- Cover a total distance of not less than 150nm
- Include full stop landings at no fewer than two different aerodromes en-route
- Be completed entirely online on the VATSIM Network

After completing the flight, the trainee must ensure that they upload their completed Navigation Log to Moodle. The flight must be recorded using Merlin and the Pirep number recorded in the Moodle text submission area.

**1.4.18 Detail 18 – General Skills Test**

Detail 18 General Skills Test			
	Exercise	Student	Instructor
17a	Establish Shared Cockpit Connection		
	General Skills Test		

**1.4.18.1 Session Proficiency Criteria**

- All handling to GST Standard
- All aspects of the operation in accordance with BAV C172SP SOPs
- Effective BAV Pilot Competencies were displayed with no major debrief points
- All items on the Skill Test Schedule were completed to the required standard

**1.4.18.2 Conduct of the General Skills Test**

The flight will be assessed as a private, passenger carrying flight. The safety and comfort 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 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. The tolerances for operation are given as guidance to candidates, but do not necessarily indicate that a failure will result if any boundary is exceeded. Similarly, flight within the tolerances should not be achieved at the expense of smoothness and co-ordination.

The Examiner will make allowances for adverse weather conditions such as turbulence, the handling qualities and performance of the aeroplane used and simulator limitations. The skill test tolerances shown in the Appendix are for general guidance.

**1.4.18.3 Examiner Notes**

- Refer to VATSIM P2 and P3 rating syllabi (as published by the VASTIM PTD and amended from time to time – these documents are available at <https://ptd.vatsim.net>). Note that the requirement for a 150 nm cross-country flight in the P3 syllabus is covered in Detail 17 so only the handling items and basic VFR navigation skills are required to be examined.
- Refer to OM-D Appendix C Appendix 1 for the full Skill Test Schedule and Standard