

The <b>CIX</b> VFR Club	Flight Training Notes	Exercise <b>31</b>
For Simulation Purposes only. Not to be used for real World flight	<b>SINGLE ENGINED AIRCRAFT TRAINING SYLLABUS</b>	Issue 1.6 27/04/17

## 1 INTRODUCTION

One of the limitations of Flight Simulator is that it isn't very good at teaching you to learn to fly. The inbuilt flying lessons are good as far as they go, but if you make a mistake in a lesson, the subsequent instructions become nonsensical. In lesson 2 - turning, try turning right when Rod Machado asks you to turn left, and you'll see what I mean!

Typically a real world flying student takes around 60-70 hours of flying instruction, plus ground study, to obtain his private pilot's licence. In Flight Simulator, this can be reduced to around 10 to 15 hours. There is no need for the ground study before being allowed to fly – you can fly now and learn the finer points of Aviation law later – in fact much of Aviation law isn't even relevant. And fundamentally of course – if you get it wrong and crash – it simply doesn't matter – in spite of the dedicated simulator pilot's natural wish not to.

## 2 PREPARING FOR TRAINING

### 2.1 Take it Seriously, but not too Seriously

Flight Simulator is a hobby – we do it for fun. We will be serious about our training, but we will have fun too. Otherwise what is the point? At the end of the course, you will be able to fly an aircraft in flight simulator, and know how it flies, and what to do when it doesn't want to. This type of flying is much more satisfying than simply pressing buttons on an autopilot.

### 2.2 Essential pre-course reading.

Read the Club's Training Manual, Exercises 1, 2, 3, 4a & 4b before starting training. All training material is available on the Training page of the Club web site.

## 3 THE SYLLABUS

### 3.1 Exercise 1 – Elements of an Aeroplane

#### 3.1.1 Flight Simulator Requirements

- FS9 or FSX (FS2002 is no longer supported)
- Pilot Client Software download and install
- TeamSpeak download and install. (N.B. The Club uses TS Version 2)
- Yoke, or Joystick, Pedals or not, Aircraft models & scenery.
- Flight Planning Software download and install

#### 3.1.2 Aeroplane Components

- Fuselage, wings, tailplane, engine etc.

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### 3.1.3 External Controls

- Ailerons, Elevators, Rudders, Trim tabs, Flaps and Slats, and what they do.

### 3.1.4 Aeroplane Performance

- The reference (V) speeds, operating limits and “book” performance speeds and what they mean.

## 3.2 Exercise 2 – Flight Preparation and Closedown

### 3.2.1 Before The Flight

- Personal Preparation
- Documentation
- Suitable charts
- Aerodrome Diagrams or published UK Flight Guide
- Flight Planning software (Plan-G is recommended)
- Route determined and plotted
- Pilot’s log or Flight Plan printed
- Weather – internet sources of aviation weather

### 3.2.2 Setting the Altimeter

- Basic Altimeter Theory (Altimetry)
- Inches, Millibars and Hectopascals
- Altimeter setting – QNH, QFE, The Altimeter Kollsman Scale.

### 3.2.3 Pre-Flight Checks

- Checklists – before start, starting and after start.
- Fuel – sufficient for the flight

### 3.2.4 Connecting to VATSIM

- Logging on to the VATSIM server via a pilot client
- Opening Servinfo or Vatspy and using the data
- Checking for any ATCUs in the area to be flown
- Checking VATSIM weather (may be different from real world weather at the chosen location)
- Disabling VATSIM weather if necessary for VFR flight
- Creating a VATSIM Flight Plan (within the Pilot Client)
- Entering VFR Route details (optional – just “VFR” may be entered)
- Essential entry in comment box “Cix VFR Club”

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- Optional entries in comment box /V/ (voice) /D/ (Daylight) “Trainee/Newbie”
- Saving a plan for future use
- Sending a Flight Plan to the VATSIM servers
- Setting the Transponder. VFR Code 7000; CAS Conspicuity codes; Mode C.

### 3.2.5 After Flight

- Checklists – before shutdown, and after shutdown.

### 3.2.6 Refuelling

- Flight Simulator methods
- Weight and balance considerations

### 3.3 Exercise 3 – The Aircraft in Flight

These topics are covered in more detail in later Exercises

- A Balancing of Forces: Lift versus mass; Power versus drag
- Going Up and Coming Down
- Turning
- Other Forces

### 3.4 Exercise 4a – Primary Effect Of Controls

Read Club Training Manual Exercise 4a. All training material is available on the Training page of the Club web site.

- Pitch
- Roll
- Yaw
- Making changes – lift and power
- Effectiveness of Controls
- Try it in the air - Flying the Lesson

### 3.5 Exercise 4b – Secondary Effect Of Controls

Read Club Training Manual Exercise 4b. All training material is available on the Training page of the Club web site.

- The Secondary effect of aileron
- The Secondary effect of rudder

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### 3.6 Exercise 4c – Trimming

Read Club Training Manual Exercise 4c. All training material is available on the Training page of the Club web site.

- The Trim Controls
- Balanced Flight
- The Art of Trimming
- Power, Attitude Trim
- The Only Exception
- Trim for Airspeed
- Try it in the air - Flying the Lesson

### 3.7 Exercise 5 – Taxying

#### 3.7.1 Theory Briefing

- How to taxi in Flight Simulator – surprisingly tricky in some aircraft.
- Taxiway markings
- Vital Actions before take off.

#### 3.7.2 Practical

- Lookout
- Steer with your feet not your hands
- Differential braking
- Taxying speeds
- Follow the Yellow Line

#### 3.7.3 Parking

- Location, Location (i.e. where parking is permitted)
- Checklist – after shutdown.

### 3.8 Exercise 6 – Straight and Level Flight

Read Club Training Manual Exercise 6. All training material is available on the Training page of the Club web site.

#### 3.8.1 Theory Briefing

- Forces in Equilibrium
- Attitude Flying
- Balanced Flight

#### 3.8.2 Flying

- Establishing Cruise Speed

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- Changing Speed
- Flight Instruments in Straight and Level Flight

### 3.9 Exercise 7 – Climbing

Read Club Training Manual Exercise 7. All training material is available on the Training page of the Club web site.

#### 3.9.1 Theory Briefing

- Climbing

#### 3.9.2 Flying

- Outside Checks
- Cockpit checks
- Establishing the Climb
- Returning to Straight and Level

### 3.10 Exercise 8 – Descending

Read Club Training Manual Exercise 8. All training material is available on the Training page of the Club web site.

#### 3.10.1 Theory Briefing

- Best Glide Speed
- The Glide Descent
- The Powered Descent
- Flaps
- Effect of Wind

#### 3.10.2 Flying

- Outside Checks
- Cockpit checks
- The Glide Descent without Flaps
- Resuming Straight and Level Flight
- The Glide Descent with Flaps
- Resuming Straight and Level Flight
- The Cruise Descent
- The Powered Descent with Flaps

### 3.11 Exercise 9 – Turning

Read Club Training Manual Exercise 9.

- Medium turns

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- Balance in the turn
- Rate One turns
- Climbing turns
- Descending turns
- Descending turns with flaps

### 3.12 Exercise 10a – Slow Flight

Read Club Training Manual Exercise 10a.

- Angle of attack
- Establishing Slow Flight
- Attitude Controls Airspeed, Power Controls Altitude
- Returning to Normal Cruise Flight
- Turning in slow flight

### 3.13 Exercise 10b – Stalling

Read Club Training Manual Exercise 10b.

- Mechanism of the stall
- Flaps up (Clean) stall without power
- Clean stall with power
- Power off stall with flaps
- Power on stall with flaps

### 3.14 Exercise 11 – Spin Avoidance

Read Club Training Manual Exercise 11.

Spinning isn't properly modeled in MS Flight Simulator so is only covered briefly.

- Types of Spin – incipient, developed, flat.

### 3.15 Exercise 12 – The Standard Take Off & Climb To Downwind

Read Club Training Manual Exercise 12. All training material is available on the Training page of the Club web site.

- Altimeter setting
- The VFR Circuit
- Planning – before take off
- The take off in detail
- The crosswind leg
- The downwind leg

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- Effect of wind

### 3.16 Exercise 13a – The Powered Approach and Landing

Read Club Training Manual Exercise 13a.

- The VFR Circuit
- Planning – before take off
- The base leg
- The turn onto final approach
- Final approach
- The Landing
- Common Landing Errors
- The Go-around or Missed Approach
- Touch-and-Go Landings

### 3.17 Exercise 13b – The Glide Approach and Landing

Read Club Training Manual Exercise 13b.

- The VFR Circuit
- Planning – before take off
- The base leg
- The turn onto final approach
- Final approach
- The Landing
- The Glide Approach
- Common Landing Errors
- The Go-around or Missed Approach
- The Touch-and-Go landing

### 3.18 First Solo

In Flight Simulator, it is unfortunately impossible to reproduce the exhilaration of a successfully completed first solo – which comprises one circuit and full stop landing. The chances are high that a Flight Simulator newcomer has flown “solo” a number of times, either well or badly, before committing to more formalized training with the Club. So this Exercise is not included in the Club Training Manual

### 3.19 Exercise 15 – Advanced Turning

Not yet available.

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### **3.20 Exercise 16 – Forced landing without power**

Not yet available.

### **3.21 Exercise 17 – Precautionary landings**

Not yet available.

### **3.22 Exercise 18A – Navigation Theory**

#### **3.22.1 Reading**

Read Club Training Manual Exercise 18A. All training material is available on the Training page of the Club web site.

- Definitions
- Maps and Charts
- The Magnetic Compass
- Speed
- Vertical Navigation And Altimetry
- Defining a Route

### **3.23 Exercise 18B - Navigation at lower levels and reduced visibility**

Not yet available.

### **3.24 Exercise 18C - Radio Navigation**

Not yet available.

### **3.25 Exercise 18D**

Practical VFR Navigation

This document describes the planning and execution of a solo cross-country flight similar to the Qualifying Cross Country of a RW PPL.

#### **3.25.1 Reading**

- The Club Radiotelephony Manual and CAP413.
- Using Squawkbox 3/4
- Using FSInn V1.1/V1.2
- The Airborne Flight Plan

All are available for download from the Training page of the Club web site

#### **3.25.2 Theory Briefing**

- Connecting to VATSIM
- Using the radio

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- Test call (Radio check)
- Taxying out
- Taking off
- En route
- The Airborne Flight Plan
- Emergencies
- Approach to an Air Traffic Control Zone
- Joining the Circuit
- Approach and landing
- Taxying to parking & shutdown.

### 3.26 Exercise 19

Basic Instrument Flight

#### 3.26.1 Reading

- The Club's "The IMC Rating" Tutorial
- The VATSIM UK "How to" Series on Instrument Flight Diagrams

#### 3.26.2 Flying

- NDB Tracking
- NDB/DME Approach procedures
- NDB holds
- DME Arcs
- VOR Tracking, inbound and outbound
- VOR/VOR position fixing
- ILS
- Minima & Decision Heights for IMC rated pilots
- Unusual attitudes

## 4 SUCCESS

When you have completed your solo cross country under VATSIM ATC control, you can congratulate yourself on having completed one of the most comprehensive flight training programmes in the world of Microsoft Flight Simulator, and we, the Club, hope you will enjoy the hobby so much more than previously.

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## 5 APPENDIX

The real world UK PPL syllabus is included as an illustration of how comprehensive the training is, which is provided by the Club.

Exercise	Exercise Topic
1	Familiarisation with the aeroplane
1E	Emergency drills
2	Preparation for and action after flight
3	Air experience
4	Effects of controls
5	Taxiing
5E	Taxiing emergencies
6	Straight and level flight
7	Climbing
8	Descending
9	Turning
10A	Slow flight
10B	Stalling
11	Spin avoidance
12	Take-off and climb to down-wind position
13	Circuit, approach and landing
12/13E	Emergencies (on take-off/landing)
14	First solo
15	Advanced turning
16	Forced landing without power
17	Precautionary landings
18A	Navigation
18B	Navigation at lower levels and reduced visibility
18C	Radio navigation
19	Basic instrument flight