



# CANDIDATE GUIDANCE NOTES

## GVC FLIGHT OPERATIONS ASSESSMENT

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Issue 1.0

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## Introduction

This document is intended to brief you on the format and requirements for the Flight Operations Assessment (FOA) stage of the GVC course. A good understanding of this important step in gaining your GVC qualification will enable you to arrive at your FOA fully prepared and knowing what to expect.

It is strongly recommended that any candidate wishing to undertake a Flight Operations Assessment seeks professional flying instruction and carries out sufficient practice prior to booking. Practical flight training sessions and FOA preparation courses are available from UAV Academy at additional cost, email [bookings@uavacademy.co.uk](mailto:bookings@uavacademy.co.uk) to find out more. Candidates must also be familiar with their Operations Manual as knowledge of this document will be confirmed during the FOA.

## Pilot Experience Requirements

As a guide, most people will need to have accumulated at least 5 hours of flight time before booking their FOA, however, this varies significantly from person to person. Flight training is not a requirement; however, we do recommend that you consider book some flight training with one of our instructors who will then give you guidance on what to practice and the approximate amount of flight time needed to achieve the standard required to pass your GVC FOA.

## Operations Manual

You must have an operations manual which has been approved by The UAV Academy Head of Training before you book your FOA. You should have a copy of your operations manual with you when you take your FOA. A digital copy is acceptable.

## Aircraft and Other Requirements

You are required to present an airworthy aircraft for FOA and must be confident that you have developed sufficient skill to be able to pass the assessment. Your UAS must comply with any legal requirements in force at the time of the FOA. In particular, your Operator ID must be marked on your UAS and be visible.

## Insurance

You must ensure that you have sufficient public liability insurance in place for your FOA. The UAV Academy has arranged for you to have free insurance for your Assessment through Coverdrones, a leading insurance company which specialises in insurance for commercial UAS operations. You will be sent more details by email when you reach the stage of booking your FOA. You will be required to sign a statement confirming that they have sufficient insurance in place and that their aircraft is 'fit for purpose'.

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## Photo ID

On arrival for their FOA, you will be asked to show an acceptable proof of identity such as a valid passport or photo-card driving licence. Failure to produce such identification may result in a cancellation of the FOA.

## Remote Pilot Responsibilities

It must be understood that you are entirely responsible for all flights undertaken during the FOA. You have the right to refuse any requests from the Examiner which you feel may cause an unnecessary risk to the aircraft, members of the public or crew but this may affect the outcome of the assessment. If in doubt, abort the mission and discuss the request with the Examiner.

## Equipment and Crew

You should provide all equipment, documentation, and nourishment required to complete their FOA. Your examiner will act as a visual observer during the FOA if required but will only do as you have instructed them, so you should be prepared to deliver a client briefing which includes a clear explanation of their responsibilities.

## The Flight Operations Assessment

The FOA is structured in such a way that we can assess your competency in the following areas: -

- Pre-site planning
- On-Site Planning
- Knowledge of your operations Manual
- Delivering a crew briefing
- Ability to operate procedurally, as set out in your Operations Manual
- Knowledge of your UAS capabilities and limitations
- Flying skills
- Ability to deal with emergency situations

**The examiner's assessment of your competence will incorporate all the steps and requirements set out in CAP722B which you will find in Appendix 2**

The normal sequence of events for a FOA are:

1. Review of your Pre-Site and Risk Assessments
2. Five questions about your operations manual
3. Conduct on-site survey
4. Prepare and check your UAS ready for operation
5. Deliver crew briefing
6. First flight - simple mission
7. Second flight - manoeuvres
8. Debrief and results

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You will be expected to conduct the whole operation employing the procedures set out in your Operations Manual. This includes the use of checklists. The Examiner will of course also be assessing your ability to control the aircraft accurately and in a safe manner.

The FOA will require a minimum of two (normally) and a maximum of three flights, so you should arrive for your FOA with sufficient battery packs to be able to complete these flights without needing to recharge.

Half a day (about three hours) are allocated for each FOA and the required elements must be completed in this time, any extra time may be allocated to candidates but this will be at the discretion of the Examiner.

## Preparation for the FOA

You will be emailed with joining instructions which will include the location identified with a post code, latitude and longitude or a link to Google maps for the selected location. You will also be given contact details for your Examiner.

You should assume that permission to use the site is granted. You are responsible for checking NOTAM information. You will be expected to know what class of airspace the site is in and to have a good knowledge of local airfields and any restricted airspace. You should NOT contact any Air Traffic Control (ATC) unit or any other third party when preparing for their FOA at any of the selected sites.

The Examiner will expect you to approach the FOA as if it is a commercial operation, so any equipment, signs, cordons, procedures and personnel required for a standard flight operation should be provided. You will be expected to explain the findings of your Pre-Site Assessment to the examiner and will be asked a series of questions about this and your Operations Manual.

## Weather

You are responsible for ascertaining weather conditions in relation to the limitations of their specific aircraft at the proposed assessment site. Assessment bookings may be moved up to eighteen four hours before the scheduled assessment due to unfavourable conditions by following the link at the bottom of the booking confirmation. You should contact your Examiner the day before the FOA to discuss the weather if it looks marginal.

It must be stressed that you are responsible for ensuring that the UAS is flown within limitations. A failure to complete the FOA will count as a fail and the assessment must be rebooked.

## Local Sites

You may provide an FOA site in certain circumstances and by special arrangement. In these circumstances, the suitability of the site must be agreed with the examiner and you will be responsible for all permissions, insurance and legal requirements.

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Additional charges will apply for the Examiners time and travel costs, so this option is only advisable if there are two or more candidates wanting to complete their FOA.

## Pre-site Survey

You will be expected to complete a Pre-site survey prior to arriving for the FOA and you should bring the recorded findings with you together with any additional supporting documentation.

This Pre-site survey should cover aspects such as:

- Identification of any local airfields, danger, no-fly, restricted or prohibited areas
- Identification of the airspace classification at the selected FOA site
- Identification of any footpaths or bridleways near the FOA site
- Any Air Traffic Control (ATC) requirements (**DO NOT CALL ATC**)
- Identification of any relevant NOTAM's which may affect the FOA
- Identification of any potential topographical features which may cause potential issues
- A Weather forecasts for the selected FOA site
- KP factor forecast for day of flight
- Predicted satellite availability at the FOA site
- Identification of any other factors or hazards at the FOA site
- Any appropriate contact numbers

## On-site Survey

You will be fully briefed by the Examiner on each stage of the assessment. The findings of the Pre-site survey will then be discussed followed by a short question and answer section on your Operations Manual.

You will then be expected to conduct an On-site survey which should take no longer than twenty minutes, including documenting the findings. On completion, you will be required to brief the Examiner on your findings.

This Pre-site survey should cover aspects such as:

- Identification of take-off, landing operating and alternate emergency areas
- Local nearby persons or livestock
- Public access points
- Buildings or any geographical hazards which may exist
- Identification of any additional footpaths
- Actual On-site weather assessment
- Potential Radio Frequency Interference issues (RFI)

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## Aircraft and Equipment Preparation

You must demonstrate the ability to prepare all equipment, including making the aircraft ready for flight, following the procedures set out in the candidate's Operations Manual. This would normally involve the use of checklists or flight reference cards (FRC's). Consider safety equipment and ground equipment clearance requirements.

## Briefing

Prior to the start of flying, you will be required to give a briefing to any crew members or relevant persons present at the FOA site. The Examiner should be briefed as if they were the client or client observer accordingly to ensure they are under your control as the Remote Pilot. The emergency procedures for a Pilot Incapacitation and Aircraft Fire should be included in your briefing.

## Required Flight Procedures

You will be required to demonstrate a disciplined and procedural approach during the FOA. In particular, the Examiner will be looking for competency in the following areas:

- Flight Planning
- Pre-Flight Checks (using a checklist)
- In Flight system monitoring
- Post-Flight Checks

## Simulated Emergency Scenarios

You will be expected to demonstrate the procedures listed in their Operations Manual for at least two simulated emergencies during the FOA. These will be chosen at the examiners discretion from the list below:

- Air incursion with another airspace user
- Ground incursion / persons, vehicles, animals
- Loss of Command & Control link (Fail safe)
- Loss of Global Navigation Satellite System (GNSS)
- Pilot or crew incapacitation
- Aircraft or ground station fire

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## Waypoint Exercises

Aircraft which are controlled by a pre-programmed waypoint method are not required to conduct the requested manoeuvres listed below. These aircraft will be set a specific mission by the examiner.

During this mission, the remote pilot will be expected to demonstrate their competence in the following disciplines:

- Waypoint mission programming
- Take-off planning and preparation
- Demonstration of pilot intervention
- Landing planning and preparation
- Aborted landing or 'go-around'

## Requested Manoeuvres

The manoeuvres set out below are for candidates taking an FOA with aircraft controlled directly by the remote pilot which includes the majority of multi-rotor aircraft.

You will be expected to demonstrate any or all of the manoeuvres on the following pages at the Examiner's discretion.

You must be able to fly the requested manoeuvres to an acceptable standard of precision of control. You will be given three attempts at each manoeuvre. Failure to achieve an acceptable standard in any one of these manoeuvres after three attempts may result in a failure of the FOA.

## ATTI Mode Flying

If your UAS is capable of being manually switched into ATTI mode (non-position hold) then you will be expected to demonstrate that you are capable of flying in this mode and, depending on the wind strength when you take your FOA, may be asked to fly **any** of the manoeuvres in ATTI. If your UAS cannot be switched into ATTI mode, your Examiner will not ask you to fly in ATTI. Other flight modes, such as course, home lock or waypoint are not generally permitted.

Being able to fly in ATTI mode (if your UAS is capable) is a UK CAA requirement. If your UAS cannot be switched into ATTI mode, we make a note on your FOA report that we were unable to assess your ability to fly in ATTI because of the limitations of your UAS. However, this makes no difference whatsoever to your CAA Permission for Commercial Operations.

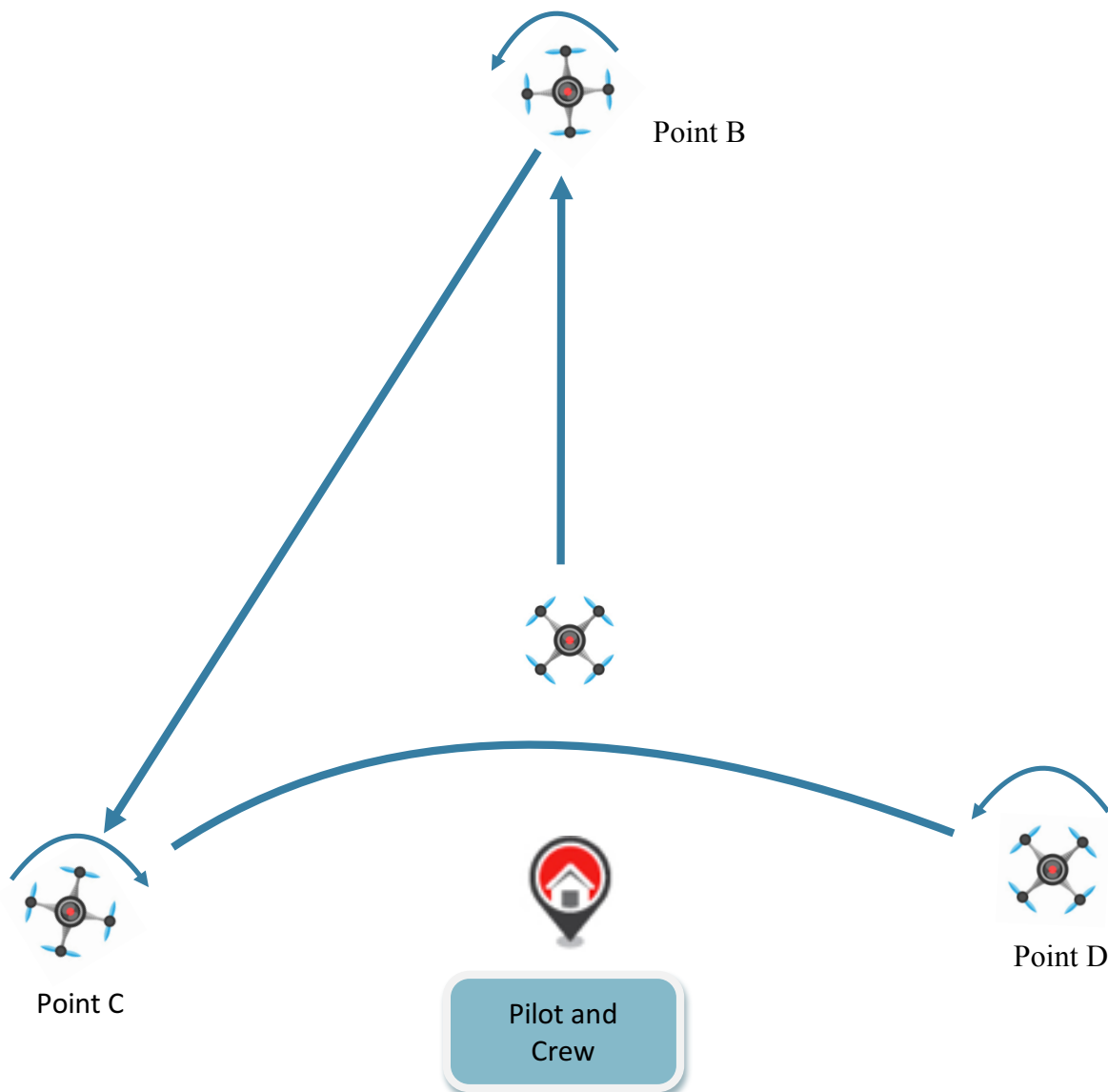
## Required Manoeuvres

### 1. Heading and Drift Control (Point to Point)

The objective of the exercise is to examine your ability to fly the aircraft between positions directly. The exercise will also examine the candidate's spatial awareness and ability to deal with environmental factors such as wind and sun's position etc.

You will be asked to fly your SUA directly from point A to point B. Once at point B, the SUA should turn to face and fly directly to point C. At point C, the UAS should turn to face and fly to point D. At point D, the UAS should turn to face point A.

The exercise should be flown at constant altitude. You should not fly your UAS overhead or behind you and your Examiner at any time unless your Examiner give explicit instructions to do so.



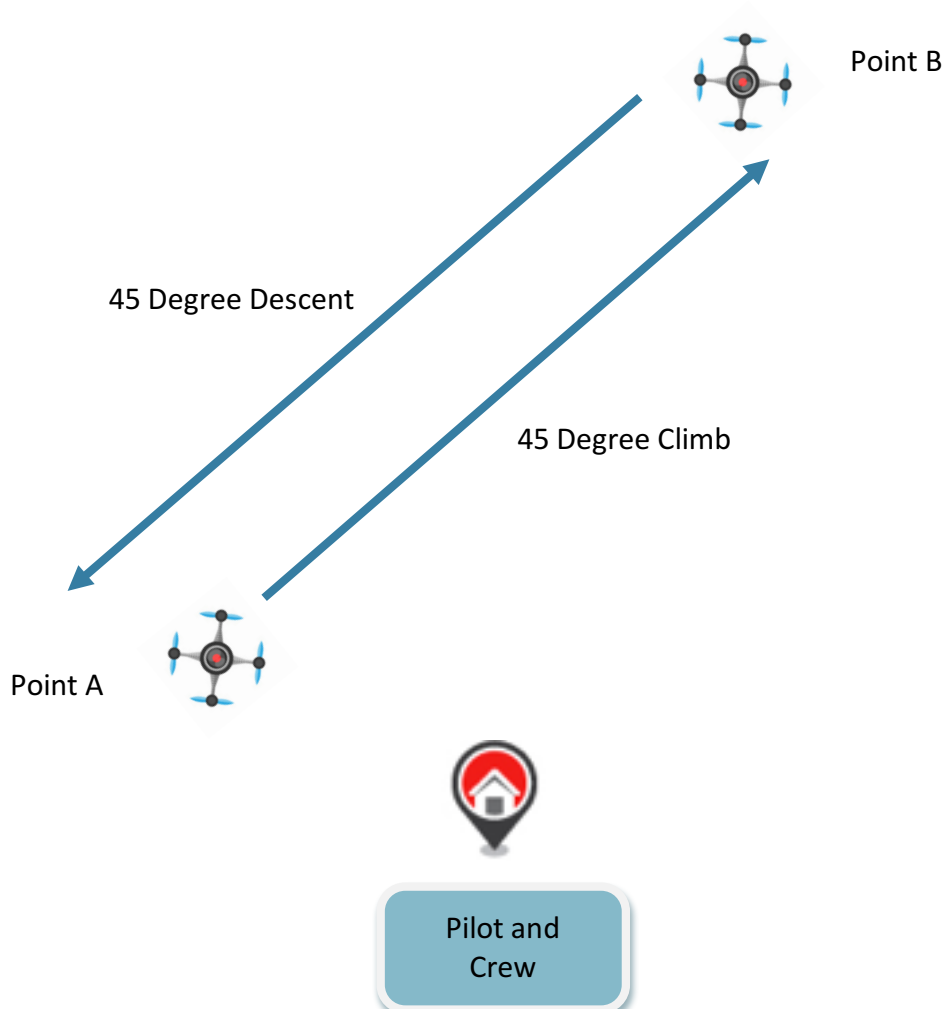


## 2. Constant Climb and Descent

The exercise is designed to examine your spatial awareness and ability to judge potential hazards. The exercise will also require good co-ordination of throttle and the pitch controls.

The UAS is required to fly directly **backwards** from point A to point B at a climbing angle of 45 degrees. The Examiner will tell the candidate when to stop the ascent (normally 30 metres) and will then expect you to fly a 45-degree descent back to the starting point. You should fly the UAS so as to achieve a constant speed and angle of ascent.

The direction in which the exercise is flown relative to you is at the Examiner's discretion, so it could be directly away from you (selfie!) or flown at 90 degrees to you.

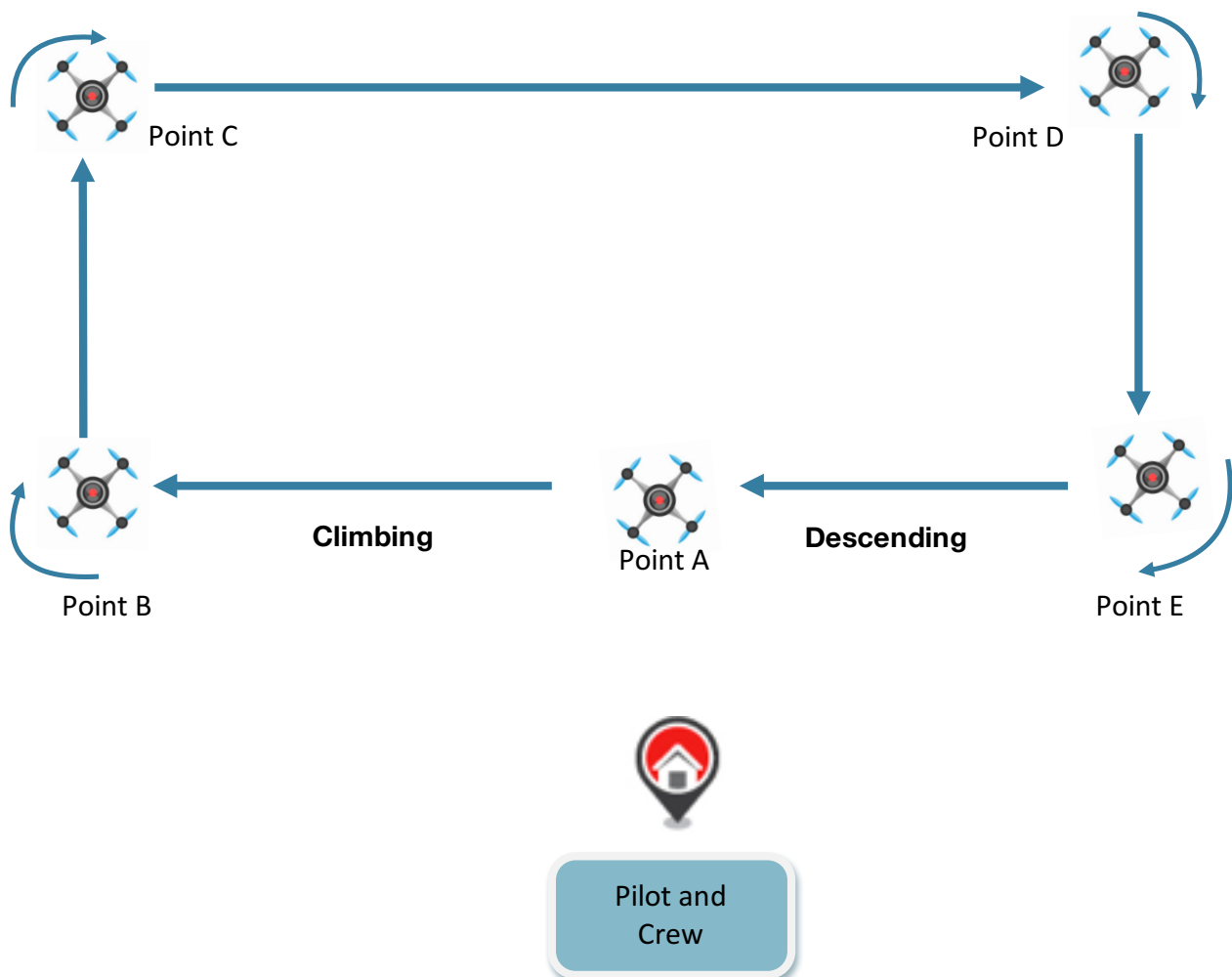


### 3. Rectangular Pattern – (Square Circuit)

The exercise examines your spatial awareness and ability to deal with varying environmental factors (wind in particular) without the assistance of the GPS stabilisation mode.

The UAS should start at a height of around three metres and be flown directly to point B changing height on route to arrive at point B at around twelve metres. The UAS should then be turned to face point C and be flown directly there, turn to face point D and fly directly there. Finally, turn to face point E and descend on route to arrive at point E at the same height the circuit was started. The UAS must always face the direction of travel and can either complete the circuit with or without stops at each point. The examiner will prompt the candidate when to turn.

This exercise becomes much more challenging as the wind speed increases as the remote pilot has to anticipate and compensate for the effect of the wind on the flight path of the UAS. The Examiner will take the wind speed into account in assessing your capabilities.

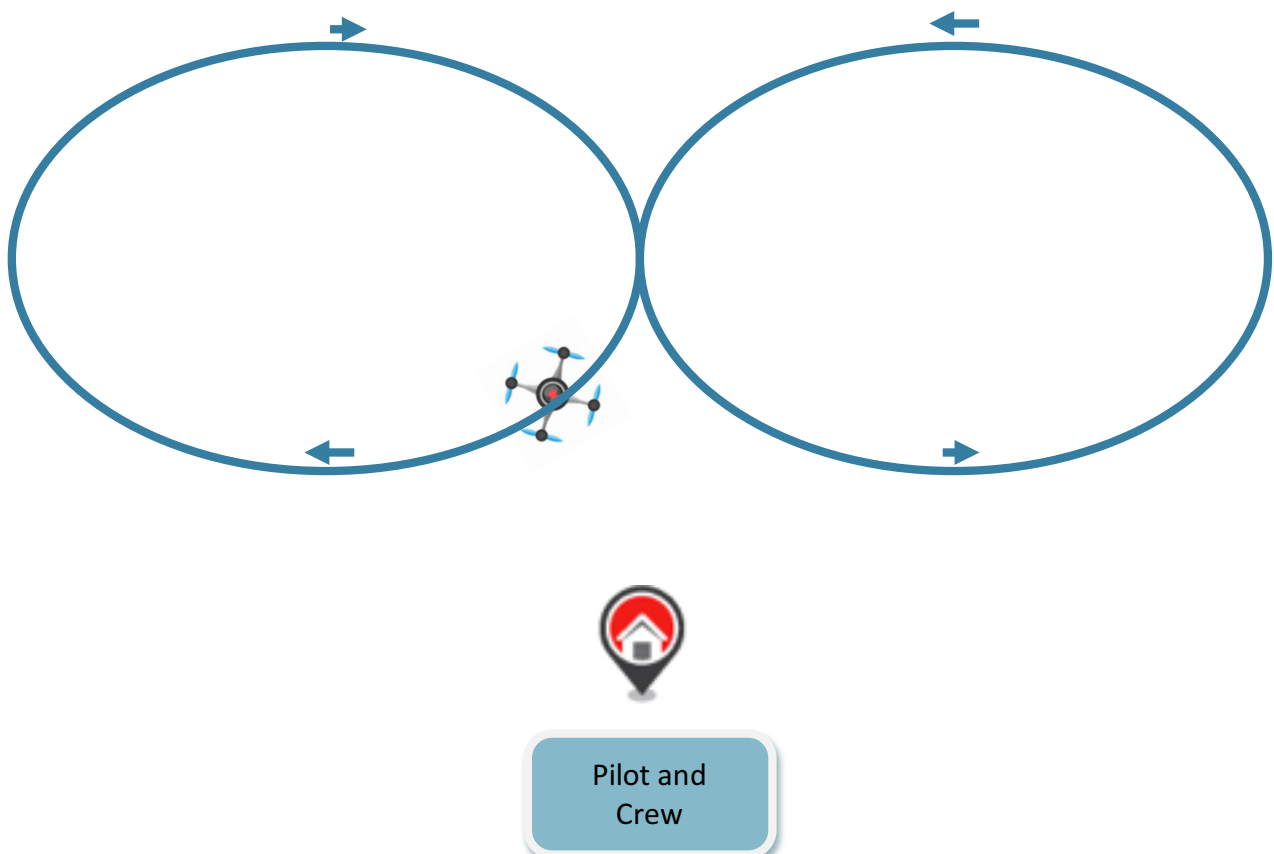


#### 4. Figure of Eight

This exercise assesses your ability to control your, your spatial awareness and your ability to deal with varying environmental factors.

The UAS should be flown in a figure of eight as shown in the diagram below. The circuit may be flown in either direction at constant height and speed. The Examiner will be looking for the circles to be of consistent size and shape and to be symmetrical with a cross over in the centre. The front of the SUA should face the direction of travel at all times. Banked turns are highly desirable but not mandatory.

The figure of eight should be flown at no more than a fast walking pace and at a height between 2 and 5 metres.

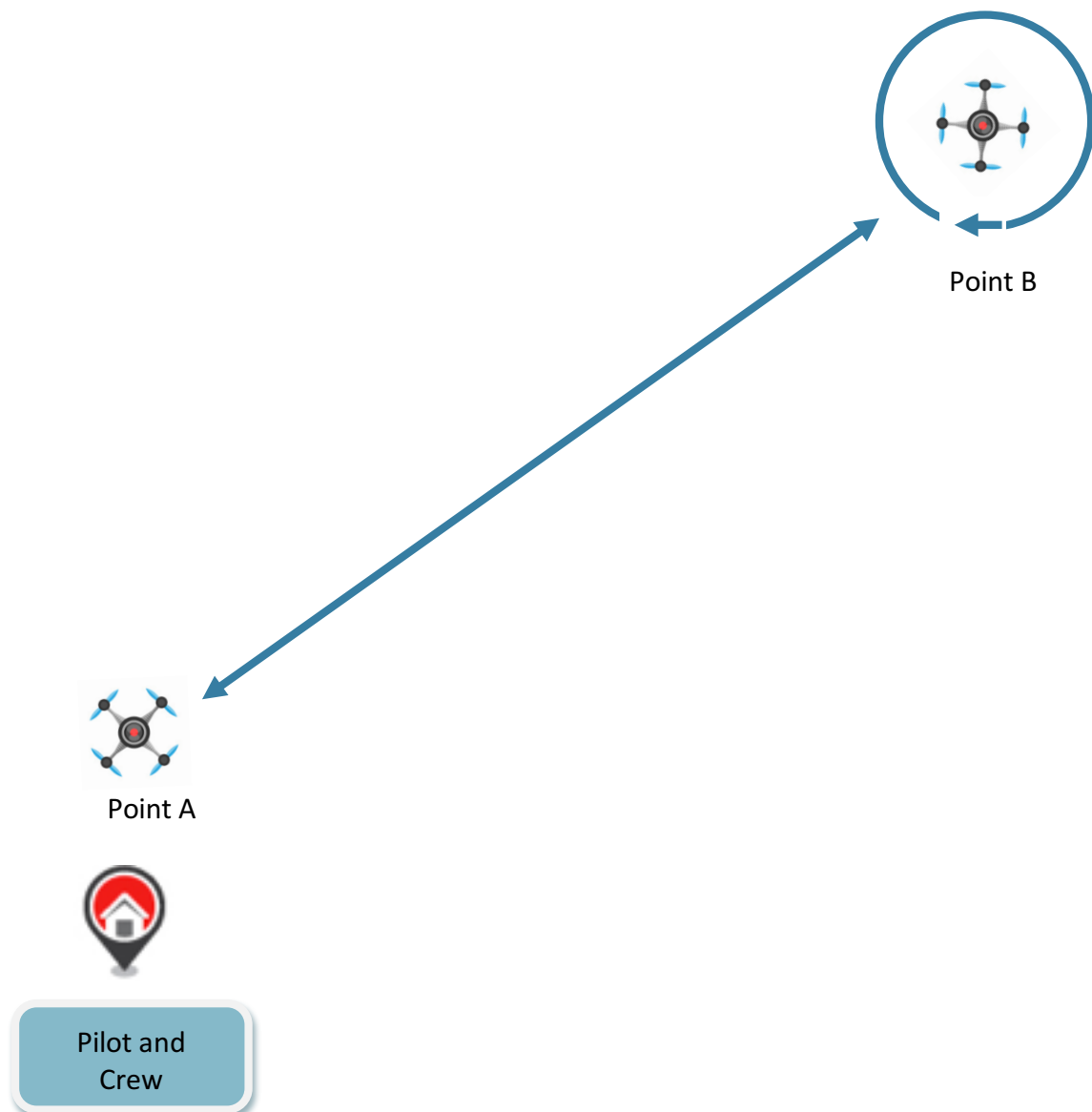


## 5. Disorientation and Recovery Exercise

This exercise examines your ability to deal with varying environmental factors and ability to re-orientate yourself with the aircraft through logical control inputs.

The candidate should fly the UAS from point A to point B. Once at point B, the aircraft should hold position and begin to rotate until the Examiner tells you to stop rotation. You then need to recover the UAS back to point A without using the tablet screen or any semi-autonomous aids such as RTH or Course Lock.

You should then fly a left-hand circle and watch your UAS track right and left. As the UAS stops tracking left, just before it starts to track right, you should take off the turn and fly forwards back towards point A.



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## 6. Position Hold in ATTI Mode

This exercise can only be conducted if your SUA is capable of being manually switched into ATTI mode.

You will be directed by the Examiner to fly the aircraft to one or more positions. At each position, the candidate will be instructed how to orientate the UAS by the examiner. You must then hold a reasonably constant position and altitude for approximately 10 seconds at the examiners discretion.

### Examination Marking

The examiner will complete a Flight Examination Report (Appendix A) using considered judgement to determine if the candidate possesses adequate skills to complete the requested tasks in a controlled and safe manner.

### Criteria for Passing the Flight Operations Assessment

**Minor Errors** are omissions or errors which, in isolation, did not directly create a risk to the safe conduct of the flight. For example, missing a step in the pre-flight checklist or not checking battery charge remaining during the flight would constitute a minor error.

**Major Errors** are errors, omissions or situations allowed to develop which directly threatened the safe conduct of the flight. For example, unexpected battery low RTH, unplanned overflight of people or flight outside defined boundary limits.

**Safety Errors** are any occurrence where which, in the judgement of the FE, caused a real risk to injury to people or damage to property. For example, an uncorrected loss of control of the UAS, a crash or a situation where any person had to take avoiding action to avoid a collision with the UAS

- **Minor Errors** – cumulative up 7, at which point the test is failed;
- **Major Errors** – cumulative up 3, at which point the test is failed;
- **Safety Errors** – any single safety error will result in an automatic failure.

Each time a candidate makes an error it will be recorded in the appropriate box on the assessment form.

You have to demonstrate that you can fly each of the requested manoeuvres to an acceptable standard. Failure to fly any single manoeuvre to the required standard will result in a fail, irrespective of the overall number of errors.

At the end of the assessment, the examiner will offer an overview providing areas where the candidate may improve their skills. This debriefing will last no longer than thirty minutes. Regardless of the result, you will be given a copy of the Flight Examination Report. A full FOA report will be written by the examiner and emailed to you within two days of completion of your FOA.

## Right to Appeal

You have twenty-eight days in which to appeal against a Flight Operations Assessment decision. To initiate the appeal process, an email should be sent to [admin@uavacademy.co.uk](mailto:admin@uavacademy.co.uk) stating when and where the FOA took place and the reason for the appeal. An internal investigation process will then ensue, the results of which will be made available to you.

# Appendix 1 – Flight Examination Report



## Flight Assessment Report

Part 1 - Paper Copy

Part 1

Flight Assessment Details		UAS Details	
Assessment Date:		Manufacturer:	
Pilot Name:		Model:	
Organisation:		Serial Number:	
Flight Examiner Name:		UAS Category:	F/W <input type="checkbox"/> Multi <input type="checkbox"/> Hybrid <input type="checkbox"/> Other <input type="checkbox"/>
Location:		Flying Weight:	
Assessment Type:	PDRA-01 <input type="checkbox"/> Other: <input type="checkbox"/>	ATTI Mode:	Yes <input type="checkbox"/> No <input type="checkbox"/>

Candidate Declaration		Identification Checked	Please tick
I declare that the UAS I will be using for the flight assessment is 'fit for purpose' and that I have arranged appropriate public liability insurance cover which satisfies the requirements of the relevant legislation.			
Signature: _____		Date: ____/____/____	

Pre-Site Assessment	OK	maj	min	Setup, Briefing and Pre-Flight	OK	maj	min
Pre-Site Assessment adequately recorded				Checklists present and properly used :			
Airspace classification correctly identified				Aircraft and system properly prepared			
Restricted airspace identified				Physical checks of UAS properly performed			
Local airfields identified and tel numbers				System checks and calibrations performed			
NOTAMs checked				Acceptable ground equipment clearance:			
Acceptable weather forecast obtained				Adequate safety equipment deployed:			
Predicted satellite availability & KP assessed				Acceptable examiner/client briefing:			
Site hazards identified				Geofencing and flight limits checked and set			
Operations Manual knowledge acceptable				Pre take-off briefing delivered and OK			
Participant briefing delivered and acceptable				Pre take-off checks properly performed			

On-Site Assessment	OK	maj	min	Standard Emergency Scenarios	OK	maj	min
On-Site Assessment properly recorded				Air incursion			
Further hazards identified				Ground incursion			
Operating area assessed and controlled				Loss of remote control link			
Local weather assessed and recorded				Pilot incapacitation			
Appropriate operating site selected				GPS Failure (only if ATTI can be selected)			

Flight Manoeuvres	OK	maj	min	Post-Flight Actions	OK	maj	min
Standard circuit				Disarm and make UAS secure			
45 degree backwards ascent/descent				inspection of UAS for physical damage			
Figure of eight				Record data required by Ops Manual			
Heading and drift control in ATTI mode				Crew debrief			
Disorientation recovery				Determine if occurrence report required			

Assessment Result							
The flight assessment for the above named candidate has been conducted in accordance with the requirements set down by the CAA in CAP 722B. The result of the assessment is:						Flight Examiner signature:	
<b>Total Faults:</b>	Major:	Minor:	Safety Error:	<input type="checkbox"/>	Pass <input type="checkbox"/>	Fail <input type="checkbox"/>	

## Appendix 2 – CAP722B – GVC Flight Assessment Requirements

CAP 722B

Annex B | The 'General VLOS Certificate' (GVC)

<p><b>RAEs are to ensure that their students can satisfactorily demonstrate at least the following skills during the practical flight assessment.</b></p> <p><b>Subject</b></p>	<p><b>Areas to be covered</b></p>
<p><b>Pre-Flight Actions</b></p>	<p><b>Mission planning (to include meteorological checks), airspace considerations, and site risk-assessment</b></p> <ul style="list-style-type: none"> <li>- Identify the objectives of the intended operation</li> <li>- Ensure that the defined operational volume and relevant buffers (e.g. ground risk buffer) are suitable for the intended operation</li> <li>- Identify any obstacles in the operational volume that could hinder the intended operation</li> <li>- Consider whether the air flow may be affected by topography or by obstacles in the operational volume</li> <li>- Consider any external factors that may affect the flight, and assess their impact on the operation</li> <li>- Review the relevant airspace information (including on UAS geographical zones) that can have an impact on the intended operation</li> <li>- Confirm that the UAS is suitable for the intended operation</li> <li>- Ensure that the selected payload is compatible with the UAS being used for the operation</li> <li>- Determine the measures necessary to comply with the limitations and conditions applicable to the operational volume and ground risk buffer for the intended operation in accordance with the operations manual procedures for the relevant scenario</li> <li>- Identify and, where necessary, implement the procedures to operate in Flight Restriction Zones or controlled airspace, including a protocol to communicate with ATC and obtain clearance and instructions</li> <li>- Confirm that all the necessary documents for the intended operation are on site</li> <li>- Ensure all participants are sufficiently briefed on the details of the planned operation</li> </ul> <p><b>Aircraft pre-flight inspection and set-up (including flight controller modes and power-source hazards)</b></p>



<p><b>RAEs are to ensure that their students can satisfactorily demonstrate at least the following skills during the practical flight assessment.</b></p> <p><b>Subject</b></p>	<p><b>Areas to be covered</b></p>
	<ul style="list-style-type: none"> <li>- Assess the general condition of the UAS in accordance with the procedures contained within the ex and manufacturer's instructions</li> <li>- Ensure the set-up procedures are completed correctly in accordance with the manufacturer's instructions</li> <li>- Ensure that all the removable components of the UAS are properly secured</li> <li>- Make sure that the UAS software configurations are compatible/up to date</li> <li>- Check that the UAS instruments are calibrated appropriately, as required by the intended operation</li> <li>- Identify any fault, damage or configuration that may compromise the intended operation</li> <li>- Ensure the propulsion energy level (e.g. battery life, or other fuel supply) is sufficient for the intended operation</li> <li>- Confirm that the flight termination system of the UAS and its triggering system are compliant</li> <li>- Check the correct functioning of the command and control link</li> <li>- Activate the geo-awareness system and upload the information to it (if geo-awareness system is available)</li> <li>- Set the height, speed and distance limitation systems (if available)</li> <li>- Set the direct remote identification system (if fitted)</li> </ul> <p><b>'Pre-take-off verbal briefing' given by the examinee stating the basic actions to be taken in the event of an aircraft emergency or if a mid-air collision hazard arises during the flight</b></p>
<p><b>In Flight Procedures</b></p>	<ul style="list-style-type: none"> <li>- Maintain an effective look-out and keep the aircraft within Visual Line of Sight (VLOS) at all times</li> <li>- Maintain situational awareness, particularly with respect to:               <ul style="list-style-type: none"> <li>- Location of the aircraft in relation to other airspace users</li> <li>- Meteorological conditions</li> <li>- Obstacles, terrain and uninvolved persons</li> </ul> </li> </ul>

<p><b>RAEs are to ensure that their students can satisfactorily demonstrate at least the following skills during the practical flight assessment.</b></p> <p><b>Subject</b></p>	<p><b>Areas to be covered</b></p>
	<ul style="list-style-type: none"> <li>- Perform accurate and controlled flight manoeuvres at representative heights and distances (including flight in manual/non-GNSS assisted mode or equivalent where fitted)</li> <li>- Take-off               <ul style="list-style-type: none"> <li>- Perform after take-off/functionality checks</li> <li>- Hover in position (Multirotor/ Helicopter/VTOL FW only)</li> <li>- Transition from hover into forward flight (Multirotor/ Helicopter/VTOL FW)</li> </ul> </li> <li>- Climb and descent to/from level flight</li> <li>- Turns in level flight</li> <li>- Speed control in level flight</li> <li>- Transition from forward flight into hover (Multirotor/ Helicopter/VTOL FW)</li> <li>- Precision manoeuvring in hover (Multirotor/ Helicopter/VTOL FW)</li> <li>- Approach and landing</li> <li>- Actions following failure of a motor/ propulsion system (according to aircraft type)</li> <li>- Evasive action (manoeuvres) to avoid collisions</li> <li>- Real-time monitoring of aircraft status and endurance limitations</li> </ul> <p><b>Flight under abnormal conditions</b></p> <ul style="list-style-type: none"> <li>- Display continuous awareness of, and consideration for, the safety of third parties on the ground               <ul style="list-style-type: none"> <li>- Deal correctly with a partial or complete loss of power to the unmanned aircraft system while ensuring the safety of any third parties</li> </ul> </li> <li>- Manage the unmanned aircraft's flight path in abnormal situations</li> <li>- Manage a situation when the unmanned aircraft system positioning equipment is impaired</li> <li>- Manage a situation where an uninvolved person enters the zone of operation and take appropriate measures to maintain safety</li> </ul>

<p><b>RAEs are to ensure that their students can satisfactorily demonstrate at least the following skills during the practical flight assessment.</b></p> <p><b>Subject</b></p>	<p><b>Areas to be covered</b></p>
	<ul style="list-style-type: none"> <li>- React to, and take the appropriate corrective action for, a situation where the unmanned aircraft is likely to exceed the limits of the intended operating area</li> <li>- Take the appropriate action for a situation when another aircraft approaches the operating area and is in confliction with the unmanned aircraft</li> <li>- Demonstrate the recovery method following a deliberate (simulated) loss of the C2 Link. In place of any rotary wing 'return to home' function, fixed-wing aircraft may demonstrate an equivalent procedure that results in a suitably automated, low-impact descent and landing. When demonstrating this function, the student must also demonstrate how collisions will be avoided</li> </ul>
<p><b>Post-flight Actions</b></p>	<ul style="list-style-type: none"> <li>- Shut down and secure/make safe the UAS</li> <li>- Post-flight inspection and recording of any relevant data relating to the general condition of the UAS (its systems, components and power-sources), controller functionality and crew fatigue</li> <li>- Conduct a debriefing of the operation with all relevant personnel</li> <li>- Identify situations where an occurrence report may be necessary and complete the required occurrence report</li> </ul>

**END OF DOCUMENT**