Small Unmanned Aircraft Approved Training Organisation

Requirements Document

Civil Aviation Department

The Government of the
Hong Kong Special Administrative Region

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Chapter 1 – General

1.1 Purpose

1.1.1 The purpose of this **"Small Unmanned Aircraft Approved Training Organisation - Requirement Document" ("TRD")** is to detail the requirements and procedures for applicants seeking to become a SUA Approved Training Organisation and offer approved SUA training courses leading to the issue of Advanced Rating pursuant to the SUA Order.

1.2 Format of this Document

1.2.1 Reference in this document to male gender should be understood to include both male and female genders.

1.2.2 Reference in this publication to the Civil Aviation Ordinance (Cap. 448) and its subsidiary legislation are to those in force on and after 1 June 2022.

1.2.3 This document and any associated referenced document will be periodically reviewed to ensure that they remain relevant and appropriate. New, amended and corrected text will be indicated by a revision bar.

1.3 Anti-bribery Reminder

1.3.1 Anyone, while having dealings of any kind with the Civil Aviation Department (CAD), should not offer advantage to the CAD officers, or else he may commit an offence under section 4(1) and/or section 8 of the Prevention of Bribery Ordinance (Chapter 201 of Laws of Hong Kong), and be liable to a maximum penalty of a fine of $500,000 and imprisonment for 7 years.

Chapter 2 – Relevant Requirements under the Small Unmanned Aircraft Order

2.1 The Small Unmanned Aircraft Order (Cap. 448G)

2.1.1 Small unmanned aircraft (SUA) have been gaining popularity over the past few years both in Hong Kong and worldwide. The uses of SUA range from recreation and STEM education to professional deployment for powerline inspections, surveying, 3D mapping, search and rescue operations, aerial photography and filming, drone shows, etc. To grasp the tremendous potential in SUA applications in tandem with the evolving technology and innovation, while also safeguarding aviation and public safety, a forward-looking regime for regulating and supporting SUA operations is required. The SUA Order (Cap. 448G) is a piece of subsidiary legislation made under the Civil Aviation Ordinance (Cap. 448) that aims to achieve this objective. The SUA Order became effective on 1 June 2022.

2.1.2 Under the SUA Order, SUA operations are regulated under a risk-based approach. Based on the weight of the SUA and the operational risk level, SUA operations of different risk levels are subject to the corresponding regulatory requirements. These requirements may include registration and labelling of SUA, registration of remote pilots, training and assessment, equipment, operating requirements and insurance.

2.1.3 Remote pilots intending to conduct advanced operations which are of higher risk may complete CAD approved advanced training and assessment in order to obtain the necessary qualifications under the SUA Order, i.e. "Advanced Rating" assigned by the CAD. Details of the classification of SUA and SUA Operations are provided below.

2.2 Classification of SUA and SUA Operations

2.2.1 Under the SUA Order, a SUA is defined as a power driven unmanned aircraft, if its weight does not exceed 25 kilograms (i.e. including everything installed in, carried by or attached to the aircraft) at all times during the flight.

2.2.2 Classification of SUA in respect of each flight is as follows –

- **Category A1** – SUA weighing 250 grams or less at all times during the flight;
- **Category A2 –** SUA weighing more than 250 grams but not more than 7 kilograms at any time during the flight; and
- **Category B –** SUA weighing more than 7 kilograms but not more than 25 kilograms at any time during the flight.

2.2.3 Classification of SUA operations is as follows –

- **Standard Category A1 Operations**: Operations of Category A1 SUA, within the operating requirements specified by the CAD (See Table 1 below).

- **Standard Category A2 Operations**: Operations of Category A2 SUA or Category A1 SUA under exemption (G.N. 2303), within the operating requirements specified by the CAD (See Table 1 below).

- **Advanced Operations** include,
    a. Operations of Category B SUA;
    b. Operations of Category A1 / A2 SUA exceeding the respective operating requirements as specified by the CAD (See Table 1 below);
    c. Flying within a restricted flying zone ("RFZ"); or
    d. Carriage of Dangerous Goods.

2.2.4 With a view to balancing the operational need as well as the public and aviation safety, an exemption (G.N. 2303) has been made for Category A1 SUA that are equipped with a safety system capable of performing all the functions specified in or pursuant to section 13 of the Order for the purposes of section 11(1)(d) of the Order.

Note: Some typical examples of such Category A1 SUA are Autel EVO Nano series and DJI Mini series, etc.

2.2.5 Under the exemption, such Category A1 SUA can be operated within all the operating requirements applicable to Category A2 SUA, and are subject to other regulatory requirements applicable to Category A2 SUA, e.g. registration and labelling of SUA, registration of remote pilot, equipment etc.

2.2.6 For the sake of readability, Category A1 SUA fulfilling the requirements and conditions above are referred as Category A2 SUA for the rest of this document.

2.2.7 Some typical examples of Advanced Operations are –

- to fly at night
- to fly extended visual-line-of-sight (EVLOS)
- to fly at excessive heights
- to fly over or in close proximity to uninvolved people / structures / vehicles / vessels
- multi-drone show
- drone race
- to drop, project or lower items from SUA inflight

Table 1 – Operating requirements for Standard Operations

Operating Requirements	For Category A1 SUA (weight ≤ 250 g)	For Category A2 SUA* (250 g < weight ≤ 7 kg)	
Time of operations	Daylight hours only		
Maintain visual line of sight (VLOS)	✓		
Maximum flying altitude Above Ground Level (AGL)	100 ft	300 ft	
Maximum speed	20 km/hr	20 km/hr	50 km/hr
Minimum lateral separation from uninvolved people / structures / vehicles / vessels	10 m	10 m	30 m
Maximum number of SUA to be operated at the same time by the same remote pilot	1		
Maximum dimensions of SUA	1 m, except that the longest distance between any two rotor blade tips can be up to 1.2 m.		
Carriage of person or animal	No		
Dropping from SUA	None		

* Also applicable to Category A1 SUA under exemption (G.N. 2303)

2.2.8 For the avoidance of doubt, unless otherwise specified or permitted by the CAD, the operating requirements applicable to Category B SUA are the same as those involving Category A2 SUA.

2.3 Approved Training and Assessment and the Issue of Advanced Rating

2.3.1 **Section 32** of the SUA Order stipulates that **the Director-General of Civil Aviation ("DGCA") may only assign a rating to permit the person to conduct a type of flight operation if he considers that the person is fit for conducting the type of flight operation because of the person's knowledge, experience and competence as may be necessary for conducting the type of flight operation**.

2.3.2 To conduct Advanced Operations, a remote pilot shall hold an Advanced Rating to ensure that his knowledge, experience and competence as necessary for such operation under the SUA Order. The remote pilot may complete an approved training and assessment at advanced level for the issue of Advanced Rating.

2.3.3 For the aforesaid purpose, under **Section 35** of the SUA Order, the DGCA may subject to conditions as he thinks fit, **approve training courses and course providers, or to authorize assessors (if applicable)**, for the issue of Advanced Rating.

Chapter 3 – Small Unmanned Aircraft Approved Training Organisation

3.1 General Requirements

3.1.1 Training organisations or bodies may apply to the CAD and obtain an approval to provide training or conduct practical assessment for the issue of Advanced Rating.

3.1.2 An application will not normally be processed unless the applicant is considered to be an organisation capable of providing SUA training in Hong Kong, and is suitably staffed, equipped and operated for the provision of theoretical knowledge instruction and examination, and practical training and assessment in Hong Kong, as required leading to the issue of Advanced Rating pursuant to the SUA Order. Detailed requirements are provided in Chapters 4 to 9.

3.2 Application Procedures

3.2.1 An applicant should make an application to the CAD at ato_sua@cad.gov.hk for approval as an SUA ATO, accompanied by the relevant application fee[1].

3.2.2 The applicant is required to submit the application form (see **Appendix A**) together with the following supporting information as part of the application:

(a) Organisation details
- Name of the organisation;
- Registered address; and
- Organisation registration document, e.g. Business Registration Certificate

(b) List of Key Personnel and instructional staff (e.g. Training Manager, Deputy Training Manager, Instructor, Practical Assessor, etc.) and their resume (CV)

(c) Address and description of facilities to conduct theoretical knowledge instruction and examination, practical training and assessment

(d) List and information of training SUA to be used on course

(e) Course-related documentations (refer to Ch.4)
- A detailed course syllabus and lesson plans for theoretical knowledge instruction;
- Policy on attendance;
- Encrypted examination question bank (with decryption means to be submitted only upon further CAD instruction) and mechanism to ensure security of question bank; and

[1] The application fee relating to the CAD SUA Approved Training Organisation will be waived until further notice.

- Policy on examination, invigilator guide including examination rules, permitted examination duration, etc., and handling arrangement for misconduct during examination

(f) Quality assurance system
(g) Safety assurance system
(h) Document control system
(i) Records keeping system for (refer to Ch. 7 and Ch. 8)
- Trainees;
- Staff; and
- Results of quality assurance and compliance monitoring activities (e.g. audit, risk assessment etc.)

3.2.3 New applicants should note that considerable resources and efforts may be required to prepare an application for approval as an SUA ATO, particularly in relation to identification of suitable training venues or development of up-to-date training materials and other documentation. Therefore, applicants should make comprehensive planning from the outset.

3.2.4 Applications should be submitted **well in advance** of the proposed commencement of the training services. The CAD will normally make contact with the applicant within 14 working days on receipt of the submission or otherwise specified, to provide initial feedback via email. This feedback may contain preliminary findings and/or observations on the readiness of application with a request for the applicant for further information or clarification where required. The CAD will advise the applicant if the application or the submitted documents contain significant deficiencies, and the applicant may withdraw and amend their application. As the time required for the processing of the application would depend on the **completeness** and **readiness** of the submission, applicants should ensure that the submissions are in order to facilitate the processing of applications.

3.2.5 When initial findings or observations have been addressed satisfactorily and the desktop audit has been completed, the CAD will notify the applicant within 14 working days for the arrangement of an on-site audit on a date agreed by both sides to ensure that the requirements as set out in this document are complied with.

3.2.6 Once the CAD is satisfied that the applicant and the training course meet the requirements set out in this document, a CAD approval might be granted to the applicant for conducting a CAD approved training course for the issue of an Advanced Rating under the SUA Order.

3.2.7 The applicant must not advertise or conduct the training course as a CAD approved training course unless it possesses a valid approval issued by the CAD. Should the approval be varied, suspended or revoked by the CAD, or if the approval has expired,

the SUA ATO should inform and make appropriate arrangements with affected students appropriately.

3.2.8 An approval is normally valid for a maximum period of **two years**, unless otherwise specified. Approval for first-time applicant is normally valid for a maximum period of one year. All training courses intended for the issue of Advanced Rating must be conducted and completed within the validity period of approval.

3.3 Renewal

3.3.1 SUA ATO may make an application to renew the approval. Such application should be submitted **60 calendar days** prior to the expiry of the existing approval. This is to allow adequate time for the CAD to complete necessary pre-inspection work including a review of the organisation's documentation, and make arrangements for the inspection(s) / audit(s) and complete the relevant post-inspection tasks.

3.3.2 To renew an application for SUA ATO, applicant shall submit an application form (see **Appendix A**), and supplement relevant information/ documents if he wishes to implement changes for the renewed approval. All relevant records maintained during the existing approval shall be made available upon CAD request for consideration of the renewal application.

3.3.3 Applications for renewals and/or variations to CAD approvals (including the validity period of the renewed approval and/ or variation) will be considered based on previous performance under the performance-based oversight principles.

3.3.4 If an approval has expired and the organisation wishes to re-establish the approval for its training course, the organisation shall make application as a new applicant and submit all required information and documents as detailed in section 3.2.

3.4 Change of Information

3.4.1 It is a condition of the approval that the CAD shall be given adequate notice of any intended change that is significant to the operations of the organisation. When there is such an intended change, the change should be provided to the CAD for prior acceptance. Dependent on the nature and extent of the material change, some changes of information may necessitate a variation of the approval. Reasonable time should be allowed to the CAD for the processing of the change request. Some examples of changes that shall be made known to the CAD for prior acceptance are:

- changes in key personnel;
- changes in the scope of approval (e.g. inclusion of new training courses for issue of Advanced Rating);
- changes / addition of training and assessment facilities;

- addition of instructor and assessor;
- changes in syllabus and practical assessment; and
- suspension or cessation of provision of approved training services.

3.5 Transferability

3.5.1 The CAD approval granted to an SUA ATO is normally not transferable.

3.6 Contract-out of Activities

3.6.1 Subject to acceptance by the CAD, the SUA ATO may decide to contract-out certain training activities to external organisations. However, a written agreement shall be made between the SUA ATO and the contracted organisation(s) clearly defining the contracted activities and all applicable requirements. The agreement shall contain information including the list of contracted organisations, the scope of contracted activities, the hours of services to be provided, audit/ oversight arrangement, etc. The agreement and the relevant details shall be submitted to the CAD for consideration.

3.6.2 When training, examination or assessment is carried out under the sub-contract control system, the SUA ATO shall contain a specific procedure on the control of contracted organisation(s). The procedure shall be provided to the CAD for consideration if so requested.

3.6.3 As far as an approval is concerned, the ultimate responsibility for the training product or service provided by the contracted organisation(s) shall remain with the SUA ATO. Hence, the arrangement of any contracted activities shall be included in the SUA ATO's quality system.

3.6.4 As the SUA ATO will be subject to on-site audits conducted by the CAD, either on an announced or unannounced basis, the SUA ATO shall ensure that the CAD will be given access to the contracted organisation(s) so as to determine continued compliance with the applicable CAD requirements.

Chapter 4 – Requirements for the Approved Training Course

4.1 General

4.1.1 The approved training course shall be conducted in Hong Kong and shall consist of the following parts:

(1) theoretical knowledge instruction (see section 4.3 and **Appendix B**);
(2) theoretical knowledge examination (see section 4.4 and **Appendix B**);
(3) practical training (see section 4.5 and **Appendix C**);
(4) practical assessment (see section 4.6 and **Appendix C**).

4.1.2 It is noted that some SUA training courses may include course contents irrelevant to SUA operational safety, e.g. how to set up white balance of camera, camera panning skills for cinematic aerial footage, usage of post-flight data/video editing software, etc. The applicant should take note that such course contents irrelevant to SUA operational safety should not be included in their submissions to the CAD as detailed in section 3.2, even if the SUA ATO intends to provide such training within the same course. Inclusion of irrelevant information may lengthen the processing time of the application.

4.2 Use of Language

4.2.1 The course materials (e.g. syllabi, examination papers, documentation and record etc.) shall be prepared in Chinese and/or English.

4.2.2 The course shall be conducted in Chinese and/or English.

4.3 Theoretical Knowledge Instruction

4.3.1 Theoretical knowledge instruction shall be given in the form of lectures. "Self-study" or "distance learning" (e.g. non-local training course) in lieu of formal training will not normally be accepted.

4.3.2 Detailed course syllabi, lesson plans, teaching materials (including student handbook and/or instructor handbook, etc.) must be developed and submitted to the CAD for approval. Please refer to **Appendix B** for details.

4.3.3 The SUA ATO shall develop policy on student attendance.

4.4 Theoretical Knowledge Examination

4.4.1 The theoretical knowledge examination may be either electronic or paper-based and shall be conducted in a closed-book format.

4.4.2 The examination question bank (with answer keys/ marking scheme) shall be submitted to the CAD in full.

4.4.3 Each Theoretical Knowledge Examination paper shall contain **at least 48 multiple-choice** questions covering a representative cross-section of subjects specified in the syllabus at adequate level of difficulty. Regardless of whether a paper-based examination or an electronic-based examination system is adopted, it shall allow a student to re-sit the examination without encountering 20% of the same questions. SUA ATO shall prepare at least three sets of papers for this purpose.

4.4.4 Each multiple-choice question shall have **4 alternative answers** of which only one of them is the correct answer. The **time limit** for each question and **passing score** shall be **75 seconds** and **75%** respectively.

4.4.5 Examination, whether electronic or paper-based, must be invigilated at all times during the examination period. The SUA ATO must validate the candidates' identity before the examination begins.

4.4.6 The SUA ATO shall develop policy on examination, invigilator guide including examination rules, permitted examination duration, etc., and handling arrangement for misconduct during examination.

4.4.7 The SUA ATO shall develop a mechanism to ensure security of the question bank.

4.5 Practical Training

4.5.1 The SUA ATO shall provide at least 4 hours of practical training. The practical training shall include but not limited to flight preparation (e.g. site survey, risk assessment, weather assessment, flight planning, and formulation of operating and emergency procedures), normal manoeuvres, and response to simulated emergencies.

4.5.2 The practical training shall be conducted in a safe manner under close supervision of the instructor so that it will not create hazards to any person, vehicle, vessel, structure or aircraft in the vicinity. Procedures shall also be in place to cater for occurrence handling and reporting.

4.5.3 Students should normally start the practical training after passing the theoretical knowledge examination.

4.6 Practical Assessment

4.6.1 To assess the students' competence in performing normal and emergency manoeuvres, the practical assessment shall be performed by flight demonstration using SUA. The use of synthetic training device (e.g. flight simulator) for practical assessment will not be accepted.

4.6.2 Prior to the practical assessment, students are required to answer questions related to site survey, risk assessment, flight planning, and operating and emergency procedures. The assessment may be conducted in the oral format.

4.6.3 During the practical assessment, students shall be able to demonstrate competence in performing pre-flight check and normal manoeuvres, as well as the response to simulated emergencies. Please see **Appendix C** for detailed assessment items. (Appendix C lists the minimum requirements for the assessment items and SUA ATO might include more assessment items as appropriate).

4.6.4 The SUA ATO shall develop a guidance for practical assessment site set-up, as well as reference materials for Practical Assessors as to what constitutes a demonstrated competency during practical assessment (e.g. marking scheme). Procedures shall also be in place to cater for occurrence handling and reporting.

4.6.5 The practical assessment must be summarised in a written report that details what test scenario was used, the manoeuvres undertaken and an assessment of the examinee's performance for each required competence, along with guidance on areas for improvement where applicable. Report must also contain details of the examinee, assessor, date and location of the assessment.

4.6.6 Subject to the CAD's agreement, the SUA Training Organisation may conduct theoretical examination and/ or practical assessment for remote pilots, who have not attended the approved training course at an CAD approved SUA Training Organisation. More details are provided at **Appendix D**.

4.7 Recommendation of Assignment of Advanced Rating

4.7.1 The SUA ATO shall ensure their students hold a valid Remote Pilot Certificate issued by the CAD throughout the whole course and have logged an accumulation of at least two hours of flight(s) as a remote pilot within the past 12 months before they are recommended to the CAD.

4.7.2 The SUA ATO shall recommend for the assignment of Advanced Rating to the students' Remote Pilot Certificates by furnishing a **recommendation report** with a list of students who completed the course **within 3 working days** of issue of the training

certificates to the CAD by email. A sample of the recommendation report and training certificate are provided at **Appendixes E and F**.

Chapter 5 – Facilities and Equipment

5.1 Facilities

5.1.1 Appropriate accommodation shall be provided for conducting the training course, which include:

(a) Facilities such as lecture rooms and examination facilities shall be of adequate size relative to the class size and scope of training, and suitably equipped and furnished with proper provision for lighting, air conditioning and ventilation;

(b) Facilities for theoretical knowledge examination shall allow proper segregation among students during the period of examination such that no student can read the paperwork or computer screen of any other student from his position during examinations; and

(c) Practical training / assessment shall be conducted at location(s) where safe operations of SUA can be ensured at all times. In general, the site should be well separated from uninvolved people, structures, vehicles or vessels and not located within RFZ.

The SUA ATO shall have sufficient office accommodation to provide a suitable working environment for instructional and operating staff. Adequate provision shall be made for administrative functions, maintenance of equipment and record-keeping. For electronic filing system, sufficient level of cybersecurity shall be in place to ensure no loss of the papers, records, personal particulars, etc. during the retention period.

5.2 Equipment

5.2.1 Each lecture room shall have appropriate presentation equipment of a standard that will allow students to adequately read presentation materials in the lecture room.

5.2.2 Instructional equipment, which includes but is not limited to an appropriate selection of SUA, associated components and controlling device of the SUA, presentation equipment, drone map and flying chart, checklist, quick reference handbook and other tools, where appropriate to the particular subject module of training course (see required modules at **Appendix B**) being instructed, must be prepared for the training and/or assessment.

5.2.3 Instructional equipment may include representative synthetic training devices (e.g. flight simulator with a hand-held remote controller) to assist students in their understanding of the particular subject matter where such devices are considered beneficial for such purposes.

Chapter 6 – Personnel Requirements

6.1 Key Personnel

6.1.1 A Training Manager shall be appointed to take overall responsibility for ensuring that the SUA ATO will comply with the regulatory requirements set out by the CAD and that all training commitments will be financed and carried out to the required standards. The Training Manager will also be accountable for all matters relating to the SUA ATO approval as well as the coordination with the CAD when needed.

6.2 Staffing

6.2.1 The SUA ATO shall ensure it has suitably experienced and qualified staff to deliver the theoretical knowledge instruction and conduct the practical assessment.

6.2.2 The SUA ATO shall evaluate the experience and qualifications of the staff and keep record of the resume (CV) of each (i) instructor (who provide theoretical and practical training) and (ii) practical assessor who conduct practical assessment. The same person who meets the qualification requirements may carry out both roles.

6.2.3 The **maximum instructor to student ratio** for **theoretical** part of the course should not exceed **1 to 20**, while the ratio for **practical** part should not exceed **1 to 10**. One assessor should assess the competence of only one student at a time during the practical assessment.

6.3 Qualifications

6.3.1 The SUA ATO shall develop standards for the experience and qualifications of the instructor and practical assessors. The minimum acceptable experience and qualifications can be found in Table 2 below.

Table 2 – Minimum Qualification Requirements of Instructors and Practical Assessors

Instructor	
SUA-related qualifications	• Holder of valid Remote Pilot Certificate with Advanced Rating issued by the CAD
Instructional experience	• Have undergone a course of instructional technique training or have previous experience in delivering theoretical knowledge instruction on SUA (which may include experience as assistant instructors)

	Note: Applicants may propose alternate qualifications which might satisfy the above such as qualified teacher or lecturer, or be a recognised instructor in another technical discipline.
Operational experience	• At least one year of SUA operations-related experience in a supervisory/ remote pilot/ instructional/ assessor role
Practical Assessors	
SUA-related qualifications	• Holder of valid Remote Pilot Certificate with Advanced Rating issued by the CAD
Instructional / assessment experience	• Have undergone a course of practical assessment / examiner training or have previous experience in conducting practical assessment on SUA Note: Applicants may propose alternate qualifications which might demonstrate sound knowledge of practical skill assessment with adequate experience of such processes.
Operational experience	• At least one year of SUA operations-related experience in a supervisory/ remote pilot/ instructional/ assessor role

6.3.2 Instructors and practical assessors shall undergo at least 3 hours of competence-based recurrent training every 24 months relevant to current technology, practical skills, human factors and the latest training techniques appropriate to the knowledge being trained or examined. The recurrent training may include activities such as attendance at relevant lectures, symposiums, in a combination of training material review records. Records shall be maintained for each instructor, examiner and practical assessor for their attendance at recurrent training sessions including but not limited to the information of the recurrent training, when it was scheduled and when it took place.

6.3.3 The impartiality of examiners and practical assessors must be guaranteed and they must be free of any pressure and incentive which could affect their judgment or the results of their investigations. For example, their remuneration must not depend on the number of assessments carried out or on the results of such assessments.

Chapter 7 – Quality Assurance and Safety Assurance Requirements

7.1 General

7.1.1 The SUA ATO shall maintain a quality assurance and safety assurance system acceptable to the CAD to ensure proper training and safety standards and compliance with all relevant requirements set out in this document.

7.2 Quality Assurance System

7.2.1 The quality assurance system should be able to readily detect any deficiencies for self-remedial action. This includes monitoring training standards, the integrity of knowledge examinations and practical assessments, and compliance with and adequacy of the procedures and requirements.

7.2.2 An internal audit schedule should be defined and all aspects of the operations should normally be reviewed at least once in every 12 months unless an extension to the audit period is required and properly documented due to unforeseeable operational reasons.

7.2.3 Audit report should be compiled and submitted to the senior management of the SUA ATO for each audit describing the audit area covered and its findings, if any. The Training Manager who is accountable to the CAD is responsible for ensuring that corrective actions are properly implemented in a timely manner.

7.2.4 Accurate, complete and readily accessible records documenting the results of quality assurance and compliance monitoring activities should be maintained. Records are essential data to enable the organisation to analyse and determine the root causes of non-conformity, so that areas of non-compliance can be identified and addressed.

7.3 Safety Assurance System

7.3.1 The SUA ATO shall assure safe operations of SUA and its training related activities through effective management of safety risks. Safety assurance system including risk assessment should be incorporated to continuously ensure and improve safety by identifying hazards, ensuring the implementation of necessary mitigating measures and remedial actions.

7.3.2 A risk assessment should be conducted to demonstrate that the proposed training or practical assessment at specific location(s) will not pose an unacceptable risk to people or property on the ground or other airspace users. The assessment results should be properly reviewed by the Training Manager and documented for audit purposes.

7.3.3 Applicants may make reference to the relevant sections of the Operations Manual template available on the CAD website in preparing for the methodology and checklist to carry out the risk assessment.

7.4 Reporting and Handling of Occurrences

7.4.1 The SUA ATO shall provide clear guidance of the reporting procedures and handling of occurrences. This may include definition of occurrences, detailed procedures of reporting of occurrences (including but not limited to the time and level of management to be reported to), handling of occurrences (including but not limited to identifying the root cause of the occurrences, implementation of corrective actions, regular review, etc.), as well as documentation of safety and occurrence reports.

7.4.2 In case of accident or incident, the SUA ATO shall immediately report the case to the Police, followed by an email notification to the CAD Unmanned Aircraft Office at sua@cad.gov.hk, if the operation has caused any damage to property of injury to person.

7.4.3 Within 24 hours of any incident or accident (whether or not there was damage to third party property or injury), the SUA ATO shall provide full details of the circumstances in writing to the CAD Unmanned Aircraft Office at sua@cad.gov.hk.

7.4.4 Upon request from the CAD, the SUA ATO shall provide additional details and/or investigation findings within three calendar days, in writing by email to sua@cad.gov.hk. A log of all incidents, accidents and occurrences shall be properly maintained by the SUA ATO and shall be made available upon the request by the CAD.

7.4.5 If the occurrence indicates potential major deficiency or safety concern of the SUA ATO, or if the SUA ATO fails to report occurrences to the CAD in a timely manner, the CAD may restrict, suspend, revoke or vary the approval as detailed in section 9.4.

Chapter 8 – Records

8.1 General

8.1.1 The SUA ATO shall maintain a record keeping system acceptable to the CAD. All records required under this chapter must be stored in a secure manner and persons authorised to access the records shall be maintained at a minimum to ensure that no altering to, damage to or tampering of records will be made in an unauthorised manner and that such confidential records will become accessible to unauthorised persons.

Note: Applicable provisions in the Personal Data (Privacy) Ordinance (Cap. 486) and codes of practice/ guidelines set out by the Office of the Privacy Commissioner for Personal Data[2] shall be observed.

8.1.2 The records shall be kept in paper form or in electronic format or a combination of both which shall be under the control of the organisation's quality system. These records shall remain legible throughout the required retention period. Paper systems shall use adequate material which can withstand normal handling and filing. Computer systems shall have at least one backup system and shall be kept current and updated.

8.1.3 The CAD shall be provided with timely access to all necessary documents and records in legible format at any time for the purposes of processing of an SUA ATO approval application or continued oversight of an SUA ATO, or when there is cause to doubt the competence of a particular person. This should be indicated in the Organisation's data collection statement(s) as appropriate.

8.2 Records of Students

8.2.1 The SUA ATO shall keep all student training, examination and assessment records for at least 3 years after the completion of the course, which include the following:

(a) Basic information of students, e.g. name, student number (if applicable), verification record of Remote Pilot Certificate and etc.;

(b) Detailed records of the training and assessment conducted under the approval, including flight experience logged for each individual students, hours of training received, type of SUA trained, theoretical knowledge examination including re-sits (e.g. exam paper or questions given to students, answers attempted, results, etc.) and practical assessment (e.g. tasks given to students, evaluation form signed by the practical assessor, etc.);

[2] More details are available at the website of the Office of the Privacy Commissioner for Personal Data (https://www.pcpd.org.hk/english/data_privacy_law/code_of_practices/code.html).

(c) Course evaluation forms filled out by students;

(d) Copies of training certificate issued to students; and

(e) Copies of recommendation report made to the CAD in support of the student remote pilots' application on the assignment of the Advanced Rating.

8.3 Records of Instructors and Practical Assessors

8.3.1 The SUA ATO shall maintain a record of all instructors and practical assessors under employment and a record of all former instructors and practical assessors for at least 3 years upon the cessation of their employment. These records shall reflect the experience and qualifications, training history and any subsequent training undertaken.

8.3.2 The following minimum information relevant to the scope of activity shall be kept on record in respect of each instructor and practical assessor:

(a) Name;
(b) Date of birth;
(c) Verification record of Remote Pilot Certificate and the respective rating;
(d) Experience;
(e) Qualifications;
(f) Training history (before entry);
(g) Subsequent training;
(h) Scope of activity;
(i) Starting date of employment; and
(j) Ending date of employment, if applicable.

8.3.3 Terms of Reference shall be drawn up for all instructors, examiners and practical assessors. Any limitation of the scope of authority of the individual must be clearly indicated. Instructors, examiners and practical assessors shall be provided with a copy of their Terms of Reference.

8.4 Records of Examination Paper

8.4.1 The SUA ATO shall maintain a record of the revisions, additions or deletions made on the examination question bank, with details on date, reason and content of the modifications on individual questions.

8.5 Records of Quality and Safety Assurance Activities

8.5.1 The SUA ATO shall maintain a record of quality and safety assurance activities as required in Chapter 8, such as audit programme, audit plan, audit report, corrective action plan and implementation, risk assessments, occurrence and follow-up actions, etc. Such records shall be maintained for at least 3 years after the completion of the activities.

Chapter 9 – Continued Validity of Approval

9.1 General

9.1.1 The SUA ATO shall make arrangements to allow the CAD to undertake any oversight activities that are necessary to assess compliance and continued compliance with the requirements.

9.1.2 It is a condition of the approval that the CAD may conduct audits, either on an announced or unannounced basis, at any time during the period of approval.

9.2 Audits

9.2.1 Audits may be conducted on a periodic basis by the CAD or as required by the CAD on announced or unannounced basis. The audit will focus on the effectiveness of the training, compliance with the procedures and requirements, quality and safety assurance systems. Continuation of an approval is not automatic but depends upon the outcome of audits.

9.2.2 During audits, the CAD may interview any staff or students, make any inspection or observe actual theoretical knowledge instruction and practical training, theoretical knowledge examination and practical assessment as necessary to assess the compliance of the SUA ATO's with the relevant requirements. The CAD may make records of the inspection and observations by note, photo or video taking as required.

9.2.3 The SUA ATO shall allow the CAD to review any report or records and to conduct any inspection. Internal audit reports, risk assessments reports, records of students and staff (i.e. instructors and practical assessors), etc. may be sampled during audits.

9.3 Non-Compliance

9.3.1 When objective evidence is identified by the CAD showing non-compliance of the SUA ATO with the applicable requirements, a finding will be issued to the SUA ATO according to below classification :

(a) A **Level 1 finding** (major deficiency) is any non-compliance with the requirements set out in this document that could lead to uncontrolled non-compliances and which could affect the safety of a SUA operation. For example:

(i) any significant non-compliance with the examination process which would invalidate the examination(s);

(ii) failure to give the CAD access to the organisation facilities during normal

operating hours after two written requests;

(iii) lack of a training manager for more than 21 working days;

(iv) failure to notify the CAD of any change that is significant to the operations of the organisation before implementing such change (see section 3.4); or

(v) significant non-compliance with the training process, syllabus and procedures.

(b) A **Level 2 finding** is any non-compliance with the requirements set out in this document that is not classified as a Level 1 finding.

9.3.2 For any item where it has been identified to contain potential problems that could lead to a non-compliance, an **observation** will be issued to the SUA ATO.

9.3.3 After receipt of notification of findings, the SUA ATO shall define a corrective action plan and implement corrective actions to the satisfaction of the CAD within a period accepted by the CAD, which should normally be no more than:

(a) **10 calendar days** after written confirmation of the finding in the case of a Level 1 finding; or
(b) **1 calendar month** in the case of a Level 2 finding.

Note: Observation should be addressed by the SUA ATO suitably. The respective follow-up actions are not required to be reported to the CAD.

9.4 Suspension, Revocation or Variation of an Approval

9.4.1 In circumstances where the SUA ATO fails to rectify the level 1 or level 2 findings as a result of the non-compliance in the timeframe specified in 9.3.2 above, or if any occurrence indicates potential major deficiency or safety concern of the SUA ATO, or if the SUA ATO fails to report occurrences to the CAD in a timely manner; restrictions may be applied to the ATO approval. Examples of such restrictions may include restricting the number of future courses, class size, etc. Only when the non-compliance has been satisfactorily addressed or rectified, the restriction may be removed.

9.4.2 If the CAD considers that the requirements set out in this document cease to be met in part or in whole, or if the standards on which approval was granted are not maintained, or if SUA ATO fails to rectify any level 1 or level 2 finding in a prolonged period of time, an approval may be suspended, revoked or varied by the CAD in accordance with Cap. 448G.

Appendix A – SUA ATO Application Form

香港特別行政區政府
民航處
Civil Aviation Department
The Government of the Hong Kong Special Administrative Region

Application for
Small Unmanned Aircraft Approved Training Organisation (SUA ATO)
under the Small Unmanned Aircraft Order
(Cap. 448G of the Laws of Hong Kong)

Please read the "Small Unmanned Aircraft Approved Training Organisation Requirements Document ("TRD")" and "Guidance Notes" on the last page of the form before submission of application.

1. ORGANISATION PARTICULARS

Name of Organisation (or bodies) (in full) :_____

Address in Hong Kong: _____

_____

Telephone No.:_____ Email Address:_____

Type of Approval Applied for :

☐ Initial

Approval will be valid for a maximum period of one year subject to conditions.

☐ Renewal (Expiry date of current approval:_____)

Approval will be valid for a maximum period of two years subject to conditions.

2. REQUIRED INFORMATION AND DOCUMENT(S)

Item(s)	**Relevant Information / Documents (If the item is set out in any of your documents, please specify the name of the document and the relevant paragraph number. The document's name should be equivalent to the file name if it is submitted via email.)**	**Submitted ? (Yes/No/ N.A.)**
A. GENERAL		
(1) Copy of the Business Registration Certificate (or other equivalent registration document) issued by the Hong Kong SAR Government if applicable		
B. TRAINING COURSE		

(1) Name of Training course		
(2) Training course outline (syllabus, lesson plans, mode of delivery and duration)		
(3) Theoretical knowledge training materials (including student handbook and/or instructor handbook, etc.) ***(see TRD Section 4.3 and Appendix B for details)***		
(4) Encrypted theoretical knowledge examination papers / question bank with answers and marking scheme ***(see TRD Section 4.4 for details)***	*(decryption to be submitted separately upon further instruction from CAD)*	
(5) Practical training and assessment materials with marking scheme ***(see TRD Section 4.5 and Appendix C for details)***		
(6) Policy on student attendance		
(7) Policy on examination, invigilator guide, including examination rules, permitted examination duration, etc., and handling arrangement for misconduct during examination		
(8) Mechanism to ensure security of examination question bank		
(9) Sample training certificate (to be issued to the trainees) ***(see TRD Appendix F for template)***		
(10) Policy on ensuring trainees obtaining 2 hours of SUA flight(s) as a remote pilot within the past 12 months before they are recommended to the CAD for Advanced Rating		
C. FACILITIES AND EQUIPMENT		
(1) Address and seating capacity of the proposed training venue / facility in Hong Kong, including at least the venues for: (i) Instructional training; (ii) Theoretical knowledge		

examination; and (iii) Practical training and assessment.		
(2) List of training SUA to be used on course (i) General description; and (ii) SUA Registration Number		
D. PERSONNEL		
(1) List of Key Personnel(s)		
(2) Resume (CV) of Key Personnel(s)		
(3) List of qualified instructor(s) / practical assessor(s)		
(4) Resume (CV) of instructor(s) / practical assessor(s) *(Relevant documentary proof to be submitted upon CAD's request)*		
E. QUALITY ASSURANCE AND SAFETY ASSURANCE		
(1) Quality assurance system: - Name of the quality assurance personnel(s) or organisation(s) - Audit plan and programme including internal audit schedule for the coming 12 months - Aspects of operations under the audit programme		
(2) Safety assurance system: - Methodology and checklist to carry out risk assessment conducted on proposed training or practical assessment at the specified location(s) - Risk assessment conducted on the proposed training or practical assessment at the specified location(s)		
(3) Procedures of reporting and handling of occurrences		
F. RECORDS		
(1) Records keeping system for - Students; - Staff; - Examination papers; and - Records of quality assurance and safety assurance activities (e.g.		

audit, risk assessment, etc.)		
G. CONTRACTED ACTIVITIES (IF APPLICABLE)		
(1) Name or list of the contracted organisation(s)		
(2) Service(s) provided by the contracted organisation(s)		
(3) Address of the contracted organisation(s)		
(4) Copy of written agreement between SUA Approved Training Organisation and the contracted organisation(s) *Including the scope of contracted activities, the hours of services to be provided, audit/ oversight arrangement, etc.*		
(5) Specific procedures on the control of contracted organisation(s)		

Declaration and Signature

I, as the Training Manager, declare that:

- All the information and materials submitted for the application of SUA ATO shall not infringe, induce and/or constitute infringement of, any intellectual property rights of any third parties;
- The information given in this application form is correct to the best of my knowledge and belief;
- I have the corporate authority for ensuring that all training commitments can be financed and carried out to the required standards; and
- I am accountable for all matters relating to the SUA ATO as well as coordination with CAD when needed.

_____ _____

Name Signature & Company Chop

_____

Date

Anyone, while having dealings of any kind with the Civil Aviation Department (CAD), should not offer advantage to the CAD officers, or else he may commit an offence under section 4(1) and/or section 8 of the Prevention of Bribery Ordinance (Chapter 201 of Laws of Hong Kong), and be liable to a maximum penalty of a fine of $500,000 and imprisonment for 7 years.

Personal Data Collection Statement

1. Purposes of Collection

The personal data provided by means of this form, including all the supporting documents included in the application, will be used by Civil Aviation Department for the following purposes:

a. Processing of your application in this form;
b. Carrying out relevant provisions of the Civil Aviation Ordinance (Chapter 448) and its subsidiary Orders / Regulations;
c. Assisting in the enforcement of any other Ordinances and Regulations by other Government Bureaux and Departments;
d. For communication purposes between Civil Aviation Department and yourself;
e. For validation and verification of authenticity of your supporting documents in association with the application;
f. For statistics and research purposes on the condition that the resulting statistics or results will not be made available in a form which will identify the data subjects.

It is obligatory for you to supply the personal data as required in this form. If you fail to supply the required data, we may not be able to process your application.

2. Classes of Transferees

The personal data you provided by means of this form may be disclosed to:

a. Other Government Bureaux and Departments for the purposes mentioned in paragraph 1 above;
b. Other Contracting States of the International Civil Aviation Organisation and Civil Aviation Authorities for the purpose mentioned in paragraph 1 above;
c. Other organisations or agencies for execution of their duties as required by Civil Aviation Department.

3. Access to Personal Data

You have a right of access and correction with respect to personal data as provided for in Sections 18 and 22 and Principle 6 of Schedule 1 of the Personal Data (Privacy) Ordinance. Your right of access includes the right to obtain a copy of your personal data provided by this form.

4. Enquiries

Enquiries concerning the personal data collected by means of this form, including the making of access and correction, should be addressed to:

Unmanned Aircraft Office
Air Services and Safety Management Division
Civil Aviation Department Headquarters
1 Tung Fai Road
Hong Kong International Airport
Lantau, Hong Kong

Guidance Notes on Application for Small Unmanned Aircraft Approved Training Organisation (SUA ATO)

Note 1: Applicants should read the *"Small Unmanned Aircraft Approved Training Organisation Requirements Document ("TRD")"* thoroughly and understand the requirements before submitting an application.

Note 2: The completed application form together with all supporting information / documents should be submitted by post to the Unmanned Aircraft Office, Civil Aviation Department Headquarters, 1 Tung Fai Road, Hong Kong International Airport, Lantau, Hong Kong; or by email to ato_sua@cad.gov.hk.

Note 3: Applicants must complete all applicable parts of this form. The CAD may not be able to process the application before all required information and documents are received by the CAD.

Note 4: Application for SUA Training Organisation Approval must include the following:

- Completed application form with all required supporting information and documents;
- Organisation details, including copy of the Business Registration Certificate or other equivalent registration document issued by the Hong Kong SAR Government if applicable;
- List of Key Personnel and Instructional Staff and their resume (CV);
- Address and description of facilities to conduct theoretical knowledge instruction and examination, practical training and assessment;
- List and information of training SUA to be used on course;
- Course-related documentations
- All the documented procedures as required in the TRD.

To supplement the submission, you may refer to the relevant paragraphs in your existing documents in the application form, and provide the CAD with a copy of the quoted documents.

Appendix B – Theoretical Knowledge Syllabus

Module	Subject	Areas to be Covered
1	Rules and regulations	1. <u>Local and non-local SUA regulatory bodies</u> - Introduce SUA related regulatory bodies, such as ICAO, CAD, CAAC, CASA, EASA, FAA & UKCAA and an overview of their regulatory functions.
		2. <u>Civil Aviation Ordinance and its sub-legislation with key focus on Cap. 448G</u> - Introduce relevant aviation regulations in Hong Kong, such as Cap. 448A Air Transport (Licensing of Air Services) Regulations, Cap. 448C Air Navigation (Hong Kong) Order 1995, Cap. 448E Air Navigation (Flight Prohibition) Order and Cap. 448G Small Unmanned Aircraft Order. - Introduce other relevant legislation, such as Cap. 106 Telecommunications Ordinance on the use of radio frequencies and Cap. 486 Person Data (Privacy) Ordinance. - Explain Cap. 448G, including but not limited to: • the concept of risk-based approach; • Classifications of SUAs (Category A1, A2 & B); • The requirements of registration, labelling, equipment, training & assessment, insurance and CAD's prior permission; • Operating requirements; • Advanced operations (refer to the respective advisory circulars) and permission application (refer to AC-002); • Offences for dangerous operation, causing or permitting SUA to endanger person or property • Safety Requirements Document – listing the details of the requirements of Cap. 448G for public to comply with; and • Gazette Notices issued under Cap.448G.
		3. <u>CAD's SUA safety guidelines and requirement document</u> - Explain the provisions of safety requirements document and guidelines issued by the CAD. - Introduce Notices to Airmen (NOTAM), Aeronautical Information Publication (AIP) and AIP Supplements (AIP SUPP) in Hong Kong.
2	Airspace	1. <u>Classification of airspace and restrictions for aircraft including SUA</u> - Describe the classifications and levels of airspace in the Hong Kong FIR (such as Class A, C and G) and their applications - Identify other airspaces users, such as those for aerial sporting and recreational activities, and the designated sites for the mentioned activities, with reference to AIP.
		2. <u>Restricted Flying Zones (RFZs) for SUA</u> - Explain the locations of RFZs by designated authorities

		3. Other applicable airspace concerns - Identify other airspaces users, including those for aerial sporting and recreational activities: paragliding activities, model aircraft flying, aerobatic flight, etc. - Identify the designated sites for the mentioned activities, with reference to AIP. - Identify other restricted sites for SUA, such as Prohibition Area under Cap. 448E
3	Map, units of measurement and navigation	1. Use of maps and aviation charts - Equip students with knowledge of latitude, longitude, grid reference, contours, obstacles, etc. - Introduce the Hong Kong Local Flying Charts and how to read the map. - Equip students with skills of chart reading and understanding of legends.
		2. Units of measurement - Introduce various units of measurement in aviation, which includes:- • Distance (Nautical miles, kilometers, meters) • Altitude/ Height (Feet, meter) • Direction (compass degree) • Aircraft / Wind Speed (Knots, km/hr, m/s) • Weight (kg, g) • Pressure (hPA, inHg) • Visibility (km) • Temperature (Celsius) - Discuss the differences amongst Altitude: Above Ground Level (AGL), Above Mean Sea Level (AMSL), Elevation and Height (from take-off point).
		3. Conversion of time system - Introduce concepts of time systems which includes:- • Coordinated Universal Time (UTC) • Local time • Conversion of time systems - Explain how to convert the date and time between systems.
		4. Principles of navigation and restrictions - Introduce principles and related components of navigation and restrictions, which includes:- • Geographic Coordinate System. Latitude and Longitude (Meridians and Parallels, common systems in Hong Kong – WGS84, HK1980, UTM) • Cardinal directions and compass degree • Inertial Measurement Unit (IMU)

		• Global Navigation Satellite System (GNSS) – Global Positioning System (GPS), Global Navigation Satellite System (GLONASS), Galileo, Beidou) • Daylight and Darkness • Effects of Winds on Heading and Track • Factors Affecting Performance of GNSS Navigation • Difference between True, Magnetic and Compass North • Magnetic Deviation and Variation
4	Aircraft general knowledge	1. <u>Principles of flight</u> - Introduce the principles of flight of fixed wing, rotary and multi-rotor aircraft which includes those in the following aspects:- • Aerodynamics , Angle of Attack, Aerofoil and relative airflow • Lift and drag • Mechanics • Four Forces of lift, Weight, Thrust and Drag acting on an SUA during take-off/ landing, level flight, climbing/descending and turning • Weight limits, Centre of Gravity Limits • Vortex Ring State (VRS) and Downwash (including the remedial actions when encountering VRS) • Flight attitude - Explain the basic working principles of propellers and their direction of rotation as a lift generating device in multirotor-type SUA.
		2. <u>Essential systems and components of SUA</u> - Explain the functions of and the techniques to control essential systems and components of SUA listed below:- • Remote Pilot station and antennas • Flight controller Units • C2 Link • Sensors and instruments • Motors • Propulsion unit • Electronic speed controller • Battery and power system • Compass and GPS Units • Airframe • Lights • Altimeters (radio, radar, laser, acoustic, vision) • Redundancy and system backups • Safety system - Explain the consequence of malfunctions. - Explain the remedial actions in case of failures. - Explain the equipment requirement of SUA as stipulated in the Safety Requirement Documents.

		3. <u>Operating limitations</u> - Explain the performance limitations of SUA in the following aspects: • Flight time • Speed • Range • Operating temperature - Explain how to maintain stability of flying SUA. - Discuss weight and Maximum take-off weight (MTOM), where weight should refer to the definition of the SUA Order. - Discuss the effect of payload on SUA operations. - Explain the weight of Category A1, A2 and B SUA and the applicable Operating Requirements.
		4. <u>Maintenance and battery management</u> - Discuss the general maintenance and repair of SUA, and the manufacturer's recommendation. - Describe the types of batteries, installation, transportation, storage, maintenance and disposal of lithium battery. - Discuss the characteristics and potential hazards of lithium battery. - Discuss the importance of security of components and payloads. - Explain the importance of carrying out pre- and post-flight check, with the use of proper checklist templates (such as the ones provided in CAD website).
5	Meteorology	1. <u>Effects on SUA</u> - Describe the weather conditions and their effects on SUA in the following aspects: • Wind • Precipitation • Visibility factors (Fog, mist, dust and haze) • Low-level clouds • Thunderstorms • Icing • Atmospheric pressure • Space weather • Electromagnetic interference • Convection updraft
		2. <u>Obtaining and interpreting weather information</u> - Introduce resources of weather information. - Discuss appropriate reports, forecasts and meteorological conventions for SUA. - Equip students with the ability to understand the interpretation of weather information on Terminal Area Forecast (TAF) and Meteorological Aerodrome Report (METAR). - Equip students with the ability to interpret weather information published by the Hong Kong Observatory.

		3. <u>Local weather assessments prior to SUA operations</u> - Explain on-site weather assessment prior to SUA operation through observation, measurement and information collected (e.g. precipitation, thunderstorm, turbulence, cloud base, etc.). - Explain the importance of ensuring that SUA are operated within its operational limits under different weather conditions.
6	Airmanship and human performance	1. <u>Flight safety</u> - Elaborate on good airmanship principles on skill, proficiency and discipline (e.g. aircraft safe to operate, remote pilots fit for operating the aircraft, proper planning and preparation). - Emphasize the importance of • Visual Line of Sight (VLOS) • Situational awareness, including see and avoid / detect and avoid manned aircraft, and air space clearance, etc. - Explain and discuss means of avoiding collisions. - Discuss occupational health and safety.
		2. <u>Crew Resources Management (CRM)</u> - Explain importance of • Effective communication with flight crew • Briefing and de-briefing to ensure flight crew is well aware of their duties and emergency procedures • Job assignment for crew members
		3. <u>Documentation and record keeping</u> - Explain the appropriate preparation of documentation including site survey, risk assessment, flight log, battery log, maintenance log, incident log, fault report, training record and operation checklist. - Discuss the importance of ensuring the documentation is properly maintained. - Remind students of the importance of proper documentation and record keeping, in case if any incidents require. - Emphasize the record of the safety system of the SUA should be maintained for at least 6 months after the flight, referring to the SUA Order for details.
		4. <u>Perceptions and illusion</u> - Discuss human's vision and limitation (ability to discern height and distance) - Introduce the factors affecting human's visions (e.g. Distance, depth, speed, lighting, scan technique and blind spot) - Explain the anatomy of the eye and its function during the day and at night - Discuss the typical visual illusions and ways to overcome (colour, glare, relative motion, background cluster) - Explain the Autokinetic/Autokinesis effect

		- Discuss the means of enhancing vision within VLOS and ways to overcome the illusions
		5. <u>Medical fitness</u> - Discuss the flight hazard of alcohol, drugs and medication - Discuss the stress, fatigue and emotional considerations affecting the SUA operations - Explain the crew health precautions
7	Operations manual, flight planning and procedures	1. <u>Pre-planning</u> - Explain the Concept of Operations (CONOPS) which includes the definitions of location, airspace, flight path, altitude, distance from remote pilot, distance from uninvolved people, structures, vessels and vehicles, etc. - Elaborate the factors affecting choice of flying area and how to carry out a good site assessment - Boundary of areas of operation, proximity of other aircraft operations, location and height obstructions, possible radio interference, security measure to limit public access to areas of operation and whether the location is within proximity of RFZ. - Explain the importance to check on weather condition (e.g. ground visibility, cloud base, wind speed, precipitation, etc). - Discuss the administrative and procedural consideration of intended task (such as whether the intended task will fall into advanced operations and to confirm all necessary documents including permission are ready prior to the intended operation) and proper flight plan. - Discuss preparation for necessary equipment and safety system for the operation, particularly the equipment requirements listed in the permission from CAD. - Discuss consideration in obtaining land or property owner's permission, if required for the particular operations. - Discuss privacy consideration.
		2. <u>Risk assessment and management</u> - Elaborate hazard identification (e.g. environmental hazards and possible radio interference). - Discuss in detail on risk analysis – • Developing a risk assessment and management matrix which includes but not limited to likelihood of occurrence and severity of consequences for assessing any external factors that may affect the flight and their impacts on SUA operation. • Ensure the students fully understand on how to carry out risk assessment. - Explain risk mitigating measures – Identifying risk mitigation measures in accordance with the risk analysis, such as using Operations Manual and checklists to mitigate risks. - Ensure proper checklist templates are used in the discussion, examples can be found on CAD website. - Discuss the safety measures are sufficient to meet the operational needs of the typical advanced operations, such as night operation,

		flying in Restricted Flying Zone, overflying people, multi-drone operation, Beyond Visual Line-of-Sight (BVLOS), flying Category B SUA, high speed drones, etc. - Explain the permission application procedures and aware of the additional safety equipment requirements.
		3. <u>Normal and Emergency Operating Procedures</u> - Understand the normal procedures, from pre-flight, takeoff/launch, in-flight, land/recovery to post-flight - Explain the importance of emergency planning and communication - Discuss the emergency procedures covering different scenarios, some examples are as below: • Loss of motor power • Loss of GPS signal • Loss of command and control datalink • Flyaway • Fire • Pilot incapacitation • Public encroachment • Aircraft encroachment • Alternative landing site - Explain the accident and incident reporting
		4. <u>Operations Manual (OM) and checklists</u> - Introduce the components of an OM - Review sample OM and checklists, which can be found on CAD website - Discuss the correct use of SUA checklists and manuals in pre-flight, inflight and post-flight
		5. <u>Hazards and situational awareness</u> - Discuss hazard identification (e.g location, airspace, obstruction, public interference, traffic, etc.) - Explain situational awareness with respect to the location of SUA in relation to other airspace users, obstruction, terrains, uninvolved people, traffic, etc.
		6. <u>Communication with Air Traffic Control and other airspace users</u> - Explain the need of communication with Air Traffic Control • The remote pilot should inform the Aerodrome Supervisor before launching and completing the SUA operation when required in the conditions of the permission for advanced operations. • The remote pilot should provide his contact number to the CAD or relevant authorities such that the SUA can be landed when instructed. - Discuss the OFCA requirements on the use of radio frequencies.
		7. <u>Pre-flight, in-flight and post-flight procedures</u>

		- Understand Pre-flight check which includes checks on weather, serviceability of equipment and the SUA, sufficiency of battery or fuel, payload, correct assembly of SUA, as well as confirmation of the details of site survey and risk assessment done in the pre-planning stage are still valid. - Understand the communications with the flight team and the involved persons to ensure that flight crew and involved persons are sufficiently notified on the details of the intended operation. - Discuss the SUA operations conditions set out in a permission, the Operations Manuals and the manufacturer's instruction. - Understand take-off (including performing take-off checks, hover in position and transition from hover into forward flight). - Understand in-flight (including climb and descent, turns, speed control, hover and transition from forward flight into hover). - Discuss means in manoeuvres to avoid collisions. - Understand landing and recovery procedures. - Understand the importance of post-flight checks (e.g. checking the condition of motor, battery, the propeller and the SUA, recording the flight in flight log).

B.1 The theoretical knowledge instruction must comprise at least 20 hours of training, excluding students' private study. A training hour means 60 minutes of tuition excluding any breaks and examination. The hours should broadly be allocated as follows:

Subject	Training Hours (Theory)
Rules and regulations	2
Airspace	2
Map, units of measurement and navigation	2
SUA general knowledge	4
Meteorology	2
Airmanship and human performance	2
Operations manual, flight planning and procedures	6
	20

The maximum number of training hours per day for the theoretical training should not be more than 8 hours under normal circumstances.

SUA ATO might take the above training hours allocation as the weighing of different subjects in the theoretical examination.

B.2 Adequate time should be allocated to classroom exercises, demonstrations, etc., to ensure effectiveness of training. The actual balance between total hours, lectures, demonstrations, etc. shall be reasonably made by the SUA ATO.

Appendix C – Practical Flying Skills and Assessment Items

Check	Item	Manoeuvres/ Procedures
1	Pre-flight actions	(a) Site survey and risk assessment *(flight restrictions, obstacles, weather, public access, conditions of take-off/ landing area, etc.)*
		(b) Aircraft external visual inspection *(security of components and payload, removal of covers, integrity of airframe and propellers, etc.)*
		(c) Pre-flight checklist procedure *(functionality of remote controller and monitor, GPS signal reception, battery level, radio interference, etc.)*
2	Take-off	(a) Controlled take-off
		(b) Climb to safe height
		(c) Control check
3	Normal operations or basic manoeuvres	(a) Flying to a designated direction and hover hold
		(b) Flying to a designated altitude and hover hold
		(c) Flying to a particular point at a designated distance
		(d) Flying a square and a circle pattern (point of interest)
		(e) Flying a figure "8" pattern
		(f) Geo-fencing (simulated by deliberate violation at high speed)
		(g) Ensure the elements of calibration, setting Home Point and testing Return-to-home function are included before each flight
4	Emergency procedures	(a) Automatic return-to-home or equivalent flight termination system for loss of command and control link and low battery
		(b) Manual landing for loss of GPS signal and low battery/ aircraft failure
		(c) Manned aircraft avoidance
		(d) Public encroachment
		(e) Simulated emergency landing using ATTI mode
		(f) Landing at alternative landing zone
5	Crew coordination and flight safety	(a) Briefings, debriefing and responsibilities of crew members
		(b) Use of Checklists in pre-flight, inflight and post-flight
		(c) Risk assessment of operating area (flight restrictions, obstacle, identification, weather, conditions of take-off/landing point, etc.)
		(d) Communications among crew members *(continuously monitoring and calling out operating parameters such as flying altitude, distance, speed, battery level, GPS signal reception, public intrusion, etc.)*
		(e) Maintaining VLOS with the aircraft at all times with an effective lookout for situational awareness of the operating environment
6	Post-flight actions	(a) Shutting down the aircraft
		(b) Post-flight checklist procedure *(visual inspection of aircraft and components, disassembly of aircraft, etc.)*
		(c) Completing relevant logs and records

Part I

C.1 Students are required to answer questions related to site survey, risk assessment, flight planning and operating, emergency procedures and post-flight actions. The assessment may be conducted in oral format.

Part II

C.2 Students shall be able to demonstrate competence in performing pre-flight check and normal manoeuvres (referring to the above table for details), which shall include but not be limited to:

(a) controlled ascent and decent with minimal drift;
(b) stable hover;
(c) straight line forward and backward, right and left at walking pace;
(d) smooth flying with even turns around a point-of-interest and along the shape of figure "8";
(e) smooth flying in square pattern (both clockwise and anticlockwise with aircraft yaw towards the direction of travel, non-headless mode); and
(f) accurate landing back to take-off position (i.e. home point).

Part III

C.3 Students shall be able to respond to simulated emergencies (referring to the above table for details), which shall include but not be limited to:

(a) loss of GPS signal – regain active control and land using Attitude (ATTI) mode;
(b) loss of command and control link – activate return-to-home (RTH) fail safe;
(c) loss of power due to faulty battery – land at alternate landing site;
(d) deconfliction from manned aircraft; and
(e) anticipation of public encroachment (e.g. emergency response to uninvolved people encroaching into the flight path of SUA)

Appendix D – Examination and Assessment for Non-student Remote Pilot

D.1 Under certain circumstances, the CAD may allow remote pilots to undertake a theoretical knowledge examination and/or practical assessment from an SUA ATO for the attainment of an Advanced Rating, without attending other parts of an approved training course as listed in paragraph 4.1.1. Such remote pilots should submit sufficient documented evidence for CAD's prior assessment and case-by-case review. For example:

(a) a certain level of experiences as an SUA remote pilot in command operated under "Permit for use of aircraft for the provision of air service – Unmanned Aircraft System (UAS)" issued under the Air Transport (Licensing of Air Services) Regulations (Cap. 448A) or the letter of "No Objection" to UAS operations issued by the CAD; or

(b) an Advanced Rating specified in the Remote Pilot Certificate which has expired for more than 1 year

D.2 Such remote pilots must be able to present relevant documentation issued by the CAD before undertaking the theoretical knowledge examination and/or practical assessment directly from an SUA ATO.

D.3 The SUA ATO shall have specific arrangement in place and shall obtain agreement from the CAD before conducting such arrangement.

Appendix E – Recommendation Report on Completion of an Approved Training Course

As an approval holder for conducting SUA training for Advanced Rating, an SUA ATO is required to submit to the CAD a recommendation report **within 3 working days** after completion of each approved training course. Recommendation reports similar to the sample form provided below shall be submitted to the Unmanned Aircraft Office via email (ato_sua@cad.gov.hk), with the email subject "SUA Approved Training Organisation Recommendation Report [Date of completion of the training course] – [Name of SUA ATO]"

The information provided in the report will be used for record and audit purposes only. If you have any questions, please contact this Office at 2910 6611.

1. Information of the approved training course
Name of SUA ATO:
CAD Approval Reference No.:
Training Course Title:
Training Dates (From / To):
Training Venue (Full address):
Name of Training Manager:
Contact No. of Training Manager:

2. Trainee(s) to be recommended for Advanced Rating endorsement		
No.	**Name of trainee**	**Student No.**
1	CHAN TAI MAN	XY 1234567
2		

3		
4		
5		
6		
7		

3. Recommendation for endorsement
I hereby certify that the trainee(s) named in this report have performed the required training and assessment in accordance with Cap. 448G and confirm that I hold the appropriate privilege to recommend the endorsement of an Advanced Rating on the Remote Pilot Certificate(s). _____ _____ Signature of Training Manager & Organisation Stamp Date

4. Schedule of upcoming courses to be conducted in the coming 3 months under the approval		
Training dates	**Class size (no. of seats)**	**Venue**
e.g. 06 -10 Jan 2022	10	ABC School campus

Appendix F – Sample Training Certificate

Training Certificate

This is to certify that

Trainee's name

has successfully completed a
ATO's approved course name from the period of
Day Month Year to *Day Month Year.*

The above person has also been assessed as a fit person for holding SUA Advanced Rating for the conduct of advanced operations based on the knowledge, experience and competence.

Certificate No.: ……

StudentNumber: …..……

Training Manager: …..…… (Name & signature with stamp)

Training Organisation: ……..… (Name with reference number of ATO approval)

Issue Date: ……

END