Template of Operations Manual for
Conducting Trial Operations of Unconventional Aircraft

Notes to Readers:

1. This template of Operations Manual ("OM") serves as a guidance for applicants intending to apply for the permission to conduct trial operations of unconventional aircraft under Part IXA of the Air Navigation (Hong Kong) Order (Cap.448C). This template is not intended to be exhaustive or prescriptive. The applicant is required to put in place appropriate policies, procedures, safety precautions and risk mitigating measures to ensure the safe conduct of all operations and compliance with all applicable regulatory requirements.

2. The applicant may amend any text in this template to suit the technical capabilities and functions of the aircraft, operational need and safety measures, as long as all essential requirements are addressed and fulfilled, and the operation can be conducted in a safe manner.

3. Texts in blue are guidance / reminder on the completion of this Operations Manual. The applicant shall read carefully and replace with appropriate policies / procedures / information before submission.

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

[APPLICANT's Name & Logo]

Operations Manual

For Conducting Trial Operations of Unconventional Aircraft

Revision History

Any amendments made to this Manual should be recorded in the table below after obtaining the acceptance from the Civil Aviation Department (CAD). The latest version of the Operations Manual should be used for all operations.

Issue Number	Amendment Date	Amendments Incorporated	Amended By

Compliance Statement

To ensure safe operations, [Applicant Name] will comply with the Air Navigation (Hong Kong) Order 1995 (Cap.448C) (AN(HK)O) and all applicable regulations in Hong Kong, and operate in accordance with the requirements and conditions set out in the relevant permission. The instructions, procedures and information detailed in this Manual will be adhered to by all personnel involved in the concerned operations.

Signature:
Accountable Manager: [Name]
Position: [e.g. Managing Director]

For and on behalf of [Applicant Name]

Organisation Registration Document.: [e.g. Business Registration Certificate no.]
Address: [add details here]
Phone: [add details here]

Acronyms and Abbreviations

Abbreviation	Description
AN(HK)O	Air Navigation (Hong Kong) Order 1995 (Cap.448C)
C2L	Command and Control Link
CAD	Civil Aviation Department
GFS	Government Flying Service
GNSS	Global Navigation Satellite System
OEM	Original Equipment Manufacturer
PIC	Pilot in Command
VLOS	Visual line of sight
…	**[Insert or delete as appropriate]**

Table of Contents

APPLICABILITY

1 Operations Manual

1.1 Compliance

1.1.1 This Operations Manual contains policies, procedures and information for the [Applicant Name]'s trial operations of unconventional aircraft under the Permission granted pursuant to Article 82B of the AN(HK)O.

1.1.2 All personnel involved in the trial operations under the authority of the permission shall comply with policies, procedures and information set out in this Manual.

1.2 Amendment

1.2.1 [Applicant Name] will periodically review this Manual to ensure that it remains relevant and appropriate. Amendment(s) will be indicated by a revision bar, submitted to the CAD for prior acceptance and recorded in the Revision History.

1.2.2 [Applicant Name] shall notify the CAD without delay of any plan or need to change this Manual or any information and/or documents submitted in support of the application and seek CAD's acceptance of any proposed changes, with the relevant supporting documents, at least 7 working days prior to the proposed effective date of such changes.

1.2.3 [Applicant Name] will ensure that each member of the flight crew and supporting crew is given access to a copy of this Operations Manual and is timely advised of any accepted amendments to the manual.

2 Scope of Operation

2.1 Types of Operation

2.1.1 This Manual describes policies, procedures and information for the following type(s) of operations in accordance with the relevant CAD permission(s):

a) [Type(s) and description of the proposed operations]

2.2 Operating Restrictions and Conditions

2.2.1 In accordance with the relevant CAD permission, all operations shall comply with the following operating restrictions and conditions:

a) Operations shall not be conducted for the purposes of public transport, as defined by Article 98(6) of the AN(HK)O;

b) All operations shall not exceed any operating limitations as specified on the Type Certificate Data Sheet or by the OEM, whichever is more restrictive;
c) All operations shall be conducted in daylight hours;
d) Goods or substances to which the Dangerous Goods Ordinance (Cap. 295) applies under section 3 of that Ordinance shall not be carried during flight, except those goods or substances that are (a) used as or form part of the power source of the aircraft for the flight; (b) necessary to be carried by the aircraft for the flight for complying with the equipage requirements; or (c) otherwise necessary for the aircraft to be fit for flying; and
e) Autonomous operations by the aircraft shall not be conducted, except in cases of emergency scenarios where the aircraft is pre-programmed for certain courses of action.
f) … [Other applicable operational restrictions]

ORGANISATIONAL PROCEDURES

3 Organisational Structure

3.1 Personnel Composition

3.1.1 An Accountable Manager shall be appointed to take overall responsibility for the trial operations, including ensuring that [Applicant Name] will comply with the requirements and conditions set out by the CAD, as well as taking up other responsibilities and duties prescribed in Section 3.2.

3.1.2 [Applicant Name] shall have an Accountable Manager at all times during the period of the permission. All operations shall be halted should the post of the Accountable Manager become vacant. [Applicant Name] shall notify and seek CAD's acceptance of any changes in the Accountable Manager's appointment at least 7 working days prior to the proposed effective date of the appointment.

3.1.3 The personnel involved in the trial operations are:

Flight Crew

- PIC
- Visual Observers
- [Post of other flight crew members]

Supporting Crew

- [Post of all supporting crew members]

3.1.4 At all times during the flight, the PIC shall operate the aircraft with the assistance of the following personnel:

- [Minimum number of flight crew and supporting crew required] [**Note:** The required number shall meet the minimum number of flight crew and supporting crew specified by the State of Design, State of Registry or OEM (whichever is more restrictive) to ensure sufficient manpower for the safe operations.]

3.2 Responsibilities and Duties

3.2.1 [Position of the Accountable Manager] is the Accountable Manager for the overall safety and compliance of any trial operations conducted by [Applicant Name]. His duties include the following:

- Handle all matters relating to the permission, and to act as the point of focal and coordinate with the CAD on all matters arising from the trial operations as necessary;
- Ensure the competency of personnel, including members of the flight crew and supporting crew and other personnel;

- Ensure that all trial operations are conducted under a valid permission and in accordance with the conditions set out in the permission and any applicable regulatory requirements;
- Ensure that all operations are conducted in accordance with the documents accepted by the CAD, including the Operations Manual, flight plan and any other related documents;
- Ensure that the Operational Manual and the list of personnel are complete and up-to-date;
- Ensure that all logs, records and documents are properly kept as stated in section 6 of this Manual;
- Report any compliance or safety issues to the CAD and report occurrence to relevant authorities in accordance with Chapter 13 of this Manual;
- Ensure any amendments made in the Operations Manual are recorded and sent to the CAD for prior acceptance; and
- Implement safety assurance and quality assurance measures including the regular self-assessment in accordance with Chapter 11 of this Manual.
- [Other relevant responsibilities and/or duties]

3.2.2 **The PIC** is responsible for supervising and issuing command for the operations on-site. His duties include the following:

- Be in charge with the safe conduct of each flight under all anticipated operating conditions, ensure that the aircraft is in a safe condition to complete the intended flight safely, and under effective surveillance at all times during the operations;
- Conduct flight in accordance with the procedures set out in this Manual and the flight plan accepted by the CAD;
- Perform emergency recovery and implement the relevant corrective actions in response to emergency scenarios;
- Ensure the overall safety of the trial operations on-site in accordance with section 8 of this Manual;
- [Maintain direct, unaided (other than corrective lenses) visual contact with the aircraft to know its location, determine its attitude, altitude and direction of flight, observe the airspace for other air traffic or hazards and determine if the aircraft become a hazard to any other aircraft, person or property] [**Note**: If the aircraft is required be flown within VLOS, the applicant shall allocate the essential duties and responsibilities according to the composition of the flight crew];
- Obtain updated information relevant to the intended operations about the weather, geographical zones, environment or condition of the operating area, in particular, the flight route before the operations;
- Confirm that all members of the flight crew maintain currency of their training (if applicable) and are physically and mentally fit to carry out their duties;
- Brief and debrief all members of the flight crew and supporting crew, and ensure they are aware of their responsibilities for the particular flight;
- Perform pre-flight check in accordance with Chapter 8 of this Manual to ensure that the aircraft is in good condition and functioning properly prior to take-off or launching, and that the means to terminate the flight as well as the programmable operating parameters of the aircraft are operational before the operations;
- Notify relevant parties and authorities prior to the operations;

- Terminate, cancel or delay any or all flight operations if, at any time, the safety of any persons or property on ground or in the air is in jeopardy, other airspace users are inside the operating area or would be placed in jeopardy, or if there is or likely to be a violation of any conditions of the permission;
- Ensure that all checks and procedures established and set forth in this Manual has been complied with by each member of the crew;
- Ensure that all logs and records in relation to the operations are properly completed and signed;
- Report accidents, incidents or occurrences in accordance with Chapter 13 of this Manual; and
- Comply with all safety instructions of CAD officers.
- [Any other responsibilities and/or duties defined by the applicant]

3.2.3 **Visual Observer** is responsible for maintaining VLOS with the aircraft and providing collision avoidance and other necessary information to the PIC. His duties include the following:

- Maintain direct, unaided (other than corrective lenses) visual contact with the aircraft to know its location, determine its attitude, altitude and direction of flight, observe the airspace for other air traffic or hazards and determine if the aircraft become a hazard to any other aircraft, person or property;
- Communicate continuously and effectively with the PIC and provide sufficient information to the Remote Pilot for collision avoidance; and
- Inform the PIC when the aircraft is approaching its maximum operating range limits.
- [Any other responsibilities and/or duties defined by the applicant]

[**Note 1**: A Visual Observer shall not take up other duties which may distract him from maintaining VLOS and providing sufficient information for collision avoidance to the PIC during the flight. If there are duties that are out of PIC's capacity, the Applicant shall consider deploying supporting crew members.

Note 2: If the aircraft shall be flown within VLOS, the VLOS shall be maintained either by the PIC or the Visual Observer. The Applicant shall allocate the essential duties and responsibilities according to the composition of flight crew.]

3.2.4 [Posts of other flight crew members and their responsibilities and/or duties]

3.2.5 [Posts of all supporting crew members and their responsibilities and/or duties]

3.3 Qualification Requirements

3.3.1 All members of the flight crew must be at least 18 years old while all pilots shall hold a valid [qualifications and other requirements, such as relevant licences, completion of a pilot training course approved or recognised by the OEM, etc.] to conduct the operations under the permission.

3.3.2 In addition, all members of the flight crew shall be familiar with the operations of the aircraft, and the [remotely piloted] aircraft systems [(comprising the aircraft, remote pilot station and C2L)].

3.3.3 Apart from the requirements above, the PIC shall also [additional qualifications and other requirements for PIC]. He shall be able to perform emergency recovery and implement the relevant corrective actions in response to emergency scenarios.

3.3.4 [Qualifications and other requirements for other crew members]

3.3.5 All members of the flight crew and supporting crew shall be trained specifically for the trial operations and the emergency procedures in accordance with Chapter 12 of this Manual. They shall get themselves familiar with the regulations in Hong Kong, CAD's requirements or circulars, conditions of the Permission and procedures detailed in this Manual.

3.3.6 All crew members shall be competent for the type(s) of operations to be conducted. They are required to satisfactorily complete the required training and assessment in accordance with the training programme as detailed in Chapter 12 of this Manual.

3.4 Personnel Management

3.4.1 All members of the flight crew and supporting crew shall be accepted by the CAD, carry out their responsibilities and duties set out in Section 3.2, and fulfil the qualification requirements in Section 3.3. The Accountable Manager shall keep a list of all members of the flight crew and supporting crew and their information as stipulated in Chapter 6.

3.4.2 The lists of crew shall be updated in a timely manner to ensure that all members of the flight crew and supporting crew accepted by the CAD are properly recorded.

3.5 External Services

3.5.1 The following external services are involved in the operations conducted by [Applicant name]. The respective roles and responsibilities of [Applicant name] and the external service provider in the performance of the services are:

Description of the External Service and Name of the External Service Provider	**Role and Responsibilities of the External Service Provider**	**Role and Responsibilities of [Applicant name]**

3.5.2 [State here or in other Sections of this Manual:

1. How to ensure that the performance and availability of the services are adequate for the intended operations;

2. whether and how potential degradation or loss of services would affect flight safety; and
3. any mitigating strategies and measures to manage such situation(s).]

4 Overview of the Aircraft and Relevant Systems and Equipment

4.1 Technical Description of the Aircraft

4.1.1 [Applicant name] is permitted to conduct the trial operations with the following aircraft:

[Particulars of the aircraft as necessary for identification, including the OEM, model, identification marks, manufacturer's serial number, etc.]

4.1.2 All aircraft used by [Applicant name] for the trial operations under the Permission shall be properly marked in accordance with the conditions in the Permission at all times during the trial.

4.1.3 [State here the basic technical features and control systems of the aircraft, including its size, maximum take-off weight, maximum flying altitude, speed and operating time, ground stations, remote controllers, flight controlling software, etc. The full technical specifications can be supplemented in the Appendix or a separate technical manual.]

4.2 Command and Control Link (C2L)

4.2.1 [State here:

1. The primary C2L network, its frequency and maximum working distance;
2. How a C2L between the aircraft, its controlling system (including the ground station, remote controller, flight controlling software, etc.) and the surveillance system is established and maintained;
3. Whether the C2L can protect against electrostatic lightning and electromagnetic emission hazards and prevent unauthorised access or seizing of control;
4. The technical mitigations to prevent the degradation or loss of the C2L, such as the use of secondary independent C2L as redundancy; and
5. The proof that the signal latency timing within the C2L falls within the tolerable limit.]

4.3 Flight Recording System

4.3.1 [State here:

1. Details of the flight recording system, including the means of recording, data and parameters to be recorded, data keeping means and period, means and format of playback and export, etc.;
2. How to set up the flight recording system; and
3. Independent back-up flight recording system (if available).]

4.4 Navigation and Positioning System

4.4.1 [State here:

1. The navigation and positioning system (including the geospatial and map data);
2. Minimum number of satellites and accuracy required for the operations;

3. The communication link between the GNSS satellites, the aircraft, the controlling system (including the ground station, remote controller, flight controlling software, etc.), surveillance system and any additional base station (if applicable);
4. Fallback design in case the GNSS signal with the aircraft is lost, weakened or being interfered; and
5. Means and frequency of the updating of navigation and positioning system and its geospatial and map data, and mechanism to ensure that it is timely updated.]

4.5 Detection and Avoidance System

4.5.1 [State here the usable onboard detection and avoidance system available and its accuracy.]

4.6 Geo-Fence and/or other Containment System

4.6.1 [State here the geo-fence and/or other containment system available on the aircraft, and how such systems will be set and maintained to effectively retain the aircraft within the proposed operating area and/or flight routes.]

4.7 Fail-Safe Mechanism

4.7.1 [State here fail-safe mechanism of the aircraft, including any equipment on the aircraft, for scenarios including the following:

1. Flight termination function that could stop the operation in case of an emergency;
2. Inoperative motors / blades / loss of power;
3. Intermittent / degraded / permanent loss of C2L or Radio Failure;
4. Partial or total failure of flight critical systems, controlling systems, surveillance system, etc.;
5. Navigation system failures (e.g. degradation or loss of GNSS due to jamming or spoofing) or degradation or loss of sensors / cameras;
6. Flight planning failures that could result in a loss of containment, e.g. incorrect setting of waypoints;
7. Flyaway, other malfunctions and emergency scenarios that may arise specific to the proposed trial operations;
8. Fire; and
9. Low battery or battery failure.]

4.8 [Other Safety Systems]

4.8.1 [State here any other safety systems available on the aircraft.]

4.9 Aircraft Operating Limitations and Conditions

4.9.1 [State here the operating limitations as specified on the Type Certificate Data Sheet or by the OEM.]

5 Operational Control

5.1 Real-time Flight Data Monitoring

5.1.1 [State here the policy for conducting real-time flight data monitoring and how the applicant would maintain such monitoring, including how real-time positioning information of the aircraft will be transmitted to ground station and/or the remote controller to ensure aviation safety along the flight route.] [**Note:** Such flight data should include, but not limited to, the aircraft's position (latitude, longitude, and altitude), speed, heading, status of critical systems, etc. The data format, means and frequency of transmission of the data should be determined and agreed with the CAD.]

5.2 Means of Communication

5.2.1 [State here the means, back-up means and mechanism for PIC to communicate with (a) other members of the flight crew and supporting crew, (b) on-board passengers, (c) other relevant personnel, and (d) the CAD and other relevant parties and authorities, for normal flight operations and for emergency (e.g. flyaway, system failures, etc.):

1. The process to ensure that the PIC is contactable in the operating areas and/or flight routes and that communication coverage is satisfactory;
2. The PIC shall have established adequate means of real-time communication between supporting crew members and involved personnel when conducting operations, including any procedures that need to be implemented. The PIC shall also consider back up communication methods in case the primary means of communication fails;
3. Communication protocols between the PIC and supporting crew members to communicate system failures and/or unsafe conditions that will affect the risk level of the trial operations.]

5.3 Requirements on the Operating Area

5.3.1 Unless approved by the CAD, the operating areas shall be away from aviation activities. In particular, the aircraft should normally not operate:

a) in controlled airspace;
b) in the Prohibited Area / Restricted Area / Danger Area as published in the AIP Hong Kong (available on **https://www.ais.gov.hk/**);
c) within 500 m from aerial sporting area such as flying sites for paragliding activities;
d) within 1 km from Aerodrome Traffic Zone as shown on local flying chart;
e) within 500 m from helicopter landing sites (unless consent from relevant helicopter operator(s) is obtained; and
f) in a way that will affect operations of aircraft to/from Hong Kong International Airport and low-flying aircraft / helicopters of the GFS and any other aircraft operators.

5.3.2 Unless approved by the CAD, operating areas that will pose higher risks to people and properties on the ground should be avoided. In particular, the aircraft should normally not overfly, or conduct emergency landing in:

a) congested areas, highways, railways or strategic routes; and
b) areas where uninvolved people, vehicles, vessels or structures are likely to be present (e.g. piers, footpaths, roads).

5.3.3 The approach and take-off areas of the aircraft shall be free of obstruction and loose debris, and of sufficient size and strength to support safe operations of the aircraft. Appropriate assessment shall be conducted in accordance with this Manual prior to each operation, paying particular attention to the size, shape, surroundings, slope and surface of the take-off/landing site to ascertain its suitability for aircraft operations with regard to the prevailing conditions.

5.3.4 All take-off/landing sites and emergency landing sites detailed in the flight plan shall allow effective rescue and fire-fighting services and the recovery of the aircraft in an expeditious manner with adequate safety considerations. The emergency landing sites shall be located within the area accepted by the CAD and at a safe distance from areas with high level of ground risk.

5.3.5 [State here other requirements on the area of operations]

5.4 Surveillance Mechanism

5.4.1 [State here the surveillance mechanism enabling the aircraft to:
1. detect and avoid other aircraft, terrain, obstacles (e.g. structure, buildings, etc.) and moving objects (e.g. vessels, vehicles, birds, etc.) in the proximity of the operating area and flight routes. The applicant should demonstrate the availability and use of onboard detection and avoidance system (e.g. vision sensors, LiDAR, etc.) that meets the accuracy requirements in relation to the proposed trial operations. In the event that the aircraft is not equipped with such equipment, the applicant should use alternative measures accepted by the CAD, including but not limited to operational measures (e.g. visual observers), that would be effective to ensure safe operations in the intended environment; and
2. continuously monitor air traffic information in proximity of the operating area and flight route (e.g. ADS-B In, web-based real time tracking services), or other alternative means of compliance.]

5.5 Site Management Policy and Procedures

5.5.1 [State here how the applicant will ensure that adequate security provisions are in place to protect the aircraft (and any such installation for its sources of energy) against unlawful interference or unauthorised access, and arranging cordoning as appropriate.]

5.6 Personnel and Equipment Redundancy

5.6.1 [State here the arrangement for backup crew members and aircraft equipment (including the remote pilot station, remote controller, flight controlling software, etc.).]

5.7 Energy Management Policy and Procedures

5.7.1 [State here the energy management policy and procedures for ensuring that the energy system of the aircraft is operational (e.g. charging policy, in-flight energy management, etc.) to enable safe operations.]

5.8 C2L Management Policy and Procedures

5.8.1 [State here the C2L management policy and procedures for ensuring that the C2L is operational to enable safe operations.]

5.9 Crew Conditions

[State here the policy and procedures to ensure that the flight crew members and supporting crew members are physically and mentally fit before conducting any operations, e.g. relevant statements and guidance, to ensure safe operations.]

5.9.1 All members of the flight crew shall not perform any duties under the influence of psychoactive substances or alcohol, or when they are unfit to perform their tasks due to, for example, injury, fatigue, medication, sickness or other causes, thereby endangering the safe conduct of flights.

5.9.2 All members of the flight crew shall declare they are fit to fly during the briefing given by the PIC before any operation is conducted.

5.9.3 If a person is unfit to perform his duties as part of the flight crew (e.g. suffering from fatigue), the operation shall not be conducted unless another qualified person is able to take over his position.

5.10 Go / No-Go Criteria

5.10.1 [State here:

1. The defined go / no-go criteria; and
2. The personnel responsible to make the decision and when the decision shall be made]

5.11 Emergency Abort Criteria

5.11.1 [State here the emergency abort criteria which, if reached, the PIC must terminate the operations immediately and safely.]

6 Documentation and Records

6.1 List of Personnel

6.1.1 The Accountable Manager shall maintain a list of members of the flight crew, supporting crew and maintenance personnel in accordance with this Manual. The following details of each crew member / personnel shall be recorded:

a) Period authorised to participate in the operations
b) Title / post
c) Qualifications (e.g. the type, ratings, reference number and validity of the applicable pilot's licence)
d) Training and assessment records (e.g. date and content of the initial and any recurrent training undergone by the crew members)

6.2 Operational Information

[**Note**: The applicant is required to record and store operational information, including information related to the flights and associated systems (all operational data, crew coordination, meteorological conditions, etc.), aircraft and/or systems failures, inspections, repairs and maintenance, personnel training, assessments, shift handover records, accident / incidents, test reports, etc. In addition, the applicant is required to design the relevant forms and place them in the Appendix of this Manual.]

6.2.1 The Accountable Manager is responsible for recording and keeping the following operational information:

- Electronic flight log
- [Flight Record (Form A)] [For example, operational data, crew coordination, meteorological conditions and aircraft and/or systems failures records]
- [Battery Log (Form B)]
- [Maintenance Log (Form C)]
- [Site Survey Form (Form D)]
- [Risk Assessment Form (Form E)]
- [Operation Checklist (Form F)]
- Flight Plan
- Aircraft Weight and Balance and Loading Schedules
- Applicable insurance policy in force during the operation
- Consent from the relevant land or property owner, management, authority or agency (if any)
- [Occurrence Report and Follow-up Actions (Form G)]
- [Self-assessment Checklist (Form H)]

6.2.2 The PIC shall ensure that all logs and records in relation to the operations are properly completed and signed.

6.3 Permission Maintenance

6.3.1 The Accountable Manager is responsible for keeping documents in relation to the maintenance of permission, which include but are not limited to:

- Permission application form
- The documents required for permission application
- List of trial operations conducted and the relevant data, analysis and reports
- Record of safety and quality assurance activities, e.g. self-assessment checklist and corrective actions performed

6.4 Retention Period

6.4.1 All records shall be maintained for at least 2 years from the date the permission expires. They could be kept in either paper form or in electronic format or a combination of both, and should be made accessible within Hong Kong and available to the CAD for inspection in Hong Kong upon request.

OPERATIONAL PROCEDURES

7 Flight Planning

7.1 Site Survey

[State here how the applicant would conduct comprehensive flight planning (including daylight reconnaissance and site safety survey) prior to the operations to ensure compliance with all applicable regulatory and site requirements. In addition, the applicant is required to design the relevant forms and place them in the Appendix of this Manual.]

7.1.1 When planning the operating area, including the flight route, the Accountable Manager shall arrange [Responsible Officer] to conduct a site survey and work out the flight details. When assessing the operating area and flight route, the following aspects shall be considered:

a) Requirements on operating area as stipulated in Section 5.3;
b) Boundary of the operating area (including likely take-off / landing area and alternative site);
c) Location and height of obstructions (e.g. buildings, trees, etc.);
d) Presence of other aircraft operations or other airspace users;
e) Flight restrictions related to the operating area (e.g. prohibited area, restricted area, danger area, local by-laws at country parks, etc.);
f) Hazards / possible radio interference associated with sites or activities in the vicinity such as live firing, fuel tank, high tension cables, high-intensity radio transmission, etc.;
g) Any obstructions to the operations and radio frequency transmission (wires, masts, buildings, etc.);
h) Mobile network signal coverage, strength and capacity, extent of interference, latency, etc.;
i) The accuracy of the navigation and positioning system, detection and avoidance system (or equivalent means) inside the operating area;
j) Habitation and recreational activities nearby, and the potential noise impacts;
k) Security measures required to limit public access to the operating area (if necessary), and whether public access would be affected;
l) Altitudes and routes to be used inside the operating area;
m) Permission from the land owner / property manager concerned (if deemed necessary); and
n) Weather conditions for the planned event (e.g. ground visibility, cloud base, wind speed, precipitation, etc.).

7.1.2 After conducting the assessment, [Responsible Officer] shall complete and sign the [Site Survey Form (Form D)].

7.2 Flight Plan

7.2.1 With the information gathered from the site assessment, [Responsible Officer] is shall work out a flight plan for the intended operation using a map or floor plan for the CAD's acceptance, which shall contain at least the following information:

a) Location of remote pilot station;
b) Take-off / landing sites;
c) Flight route;
d) Emergency landing / alternate sites;
e) Buffer zones along the flight route;
f) Geo-fenced area;
g) Cordoned area;
h) Altitude and speed;
i) Position of members of the flight crew and supporting crew; and
j) Times and duration of operations.

7.3 Risk Management

[State here how the applicant will conduct comprehensive safety risk assessment and establish mitigating strategies with reference to the specific equipment, personnel competency, types of operations, and environmental conditions of each operation. In identifying the risks of the intended trial operations, the applicant should assess the severity and probability of air risk and ground risk associated with the operations. If cross-boundary operations are involved, the risk assessment should also include assessment on network coverage and stability across the boundary.

In addition, the applicant is required to design the relevant forms and place them in the Appendix of this Manual.]

7.3.1 When planning the operations, [Responsible Officer] shall conduct a risk assessment using the [Risk Assessment Form (Form E)] to identify any hazard and determine risk mitigating measures to be implemented specific to that operation.

7.3.2 Due diligence should be exercised by the [Responsible Officer] in identifying reasonably foreseeable hazards related to the operation. Open and clear communication should be maintained with stakeholders who may be affected.

7.3.3 Operations shall only be conducted when all the risks have been mitigated down to an acceptable level.

7.4 Permission

7.4.1 [Accountable Manager] shall ensure that relevant Permission(s) is/are in force for the intended operation, and that all terms and conditions stipulated therein can be fulfilled throughout the operation.

7.4.2 If deemed necessary, [Accountable Manager] shall ensure that permission from the land or property owner, management, authority or agency concerned has been obtained prior to conducting the operations.

7.4.3 [State here whether any additional permission / licence / authorisation from other Government Bureaux / Departments / Regulatory Authorities is required and the timeline to obtain such permission / licence / authorisation.]

[**Note**: Where the proposed area of operations necessitates express consent from land/property owner and/or manager, it is the responsibility of the applicant to obtain such consent and to comply with any requirements and guidelines imposed by the owner and/or manager to ensure the safe operations of the aircraft. In addition, for cross-boundary operations, the applicant is required to obtain prior permission from the respective civil aviation authorities and government departments for customs, immigration and quarantine arrangements, as well as any other necessary approvals.]

8 On-site Procedures and Pre-flight Checks

8.1 Site Survey

8.1.1 Upon arrival at the area of operations, the flight crew shall walk around the site to confirm the site survey and risk assessment prepared at the flight planning stage are still valid.

8.1.2 If there are any additional hazards identified, actions shall be taken to ensure the operations can be safely conducted.

8.2 Cordon Procedure

8.2.1 The operating area shall be cordoned off in accordance with the flight plan accepted by the CAD to ensure adequate security provisions are in place to protect the aircraft (and any such installation for its sources of energy) against unlawful interference or unauthorised access.

8.2.2 The PIC shall ensure that clear warning signs, cones and/or safety tape are used to indicate that aircraft operations are in progress. The PIC shall ensure that sufficient members of the supporting crew are present to advise the public of the dangers of entering the operating area for sites with potential public access.

8.2.3 Should there be any public encroachment, the PIC shall handle in accordance with Section 10.10 of this Manual.

8.3 Weather Checks

8.3.1 Before the operations, the PIC shall ensure that the prevailing weather conditions are suitable for the operations with information from [the Hong Kong Observatory]. An operation shall not be conducted unless the following weather criteria are fulfilled:

a) 5km visibility;
b) 1,000 feet vertically clear of cloud base;
c) Not within 5 km of thunderstorm;
d) Wind speed below [the maximum resistance specified by the OEM]; and
e) [Other meteorological conditions].

8.4 Preparation and Serviceability of Equipment and SUA

8.4.1 The PIC shall check the aircraft to be used for the intended operation and its associated components such as the remote controller, rotor blades, batteries, camera, etc. prior to every operation to ensure that all the aircraft is properly equipped and will perform as intended under the operating conditions for which it is designed for. The PIC shall also ensure that the C2L, flight recording system, navigation and positioning system, detect and avoidance system, geo-fence, etc. are up-to-date, operational and switched on.

8.4.2 Any anomaly and maintenance conducted on the equipment shall be recorded in a [Maintenance Log (Form C)]. A test shall be conducted to confirm the serviceability of the equipment after any maintenance actions.

8.5 Aircraft Loading

8.5.1 The PIC shall ensure that all aircraft components and payload are securely installed in, carried by or attached to the aircraft so that nothing would be dropped during flight.

8.5.2 The PIC shall ensure that the weight of the aircraft does not exceed the maximum take-off weight and items carried comply with all applicable regulatory requirements and/or conditions of the Permission, and sign the aircraft weight and balance and loading schedule.

8.6 Aircraft Conditions

8.6.1 [State here how to determine that the conditions of the aircraft and its associated components are suitable for flight.]

8.7 C2L, Navigation and Positioning System and Calibration

8.7.1 [State here how to ensure that the C2L and navigation and positioning system are correctly set up, with sufficient signal strength to meet the requirements for the operations.]

8.8 Geo-fence and/or Other Containment Mechanism

8.8.1 [State here how to ensure that the geo-fence is correctly set in accordance with the flight plan and/or details of other containment mechanism.]

8.9 Return-to-Home Position / Maximum Altitude

8.9.1 [State here how to set the return-to-home position(s) and maximum altitude.]

8.10 [Passenger Safety Briefing (if applicable)]

8.10.1 [State here how to conduct safety briefings for passengers, location of safety briefing cards, etc. The applicant should place the contents of the briefing, relevant documents, etc. in the Appendix of this Manual.]

8.11 Pre-Flight Briefing

8.11.1 Before conducting the operations, the PIC shall brief all members of the flight crew and supporting crew to ensure they understand their duties and responsibilities, as well as the details of the operation, including but not limited to the flight plan, safety risk involved, risk mitigation measures in place, emergency procedures, etc. The PIC shall also ensure that all crew members are physically and mentally fit for the operations, are aware of the conditions of the Permission issued by the CAD, and will take all necessary measures to comply with such conditions specified therein.

8.11.2 The PIC shall ensure that all relevant parties (e.g. land or property owner, management, authority or agency etc.) have been informed of the operations if required.

8.12 Pre-Flight Checks

[State here all required pre-flight checks, which shall cover the following PIC's duties:

1. To ensure that the aircraft is in a safe condition to complete the intended flight safely, and under effective surveillance at all times during the operations;
2. To obtain updated information relevant to the intended operations about any geographical zones, environment or condition of the operating area, in particular, the flight route before the operations;
3. To verify that the means to terminate the flight as well as the programmable operating parameters of the aircraft are operational before the operations;
4. To notify relevant parties and authorities such as the ATC and GFS as appropriate prior to the operations; and
5. To ensure that any checks and procedures established and set forth in this Manual has been complied with by each member of the crew.

In addition, the applicant is required to design the relevant checklists and place them in the Appendix of this Manual.]

8.12.1 The PIC shall perform pre-flight check using the [Operation Checklist (Form F)] and ensure that all items are ready for the operations.

8.12.2 The operation shall not be conducted if the status of any item is "No" and fault report should be filed.

8.12.3 The PIC is responsible for ensuring that no person and property would be endangered by the operation. The operation shall not be conducted unless he has reasonably satisfied himself that the flight can be safely completed.

8.12.4 The PIC shall not conduct the operation unless before the flight he has satisfied himself that the fail-safe mechanism in the event of a failure of or disruption on any control systems, including the radio link, is in working order.

8.12.5 The PIC shall also ensure that the means of audio communication within the flight crew and supporting crew is effective.

9 Flight Procedures

[State here all normal operational procedures considering the specific operating requirements and complexity. Add extra procedures if needed.]

9.1 Start

9.1.1 Prior to take-off, [responsible crew member] shall check again that the take-off area is suitable for the operations.

9.1.2 The PIC shall notify the flight crew and supporting crew [how] that the aircraft is about to take-off.

9.2 Take-off

9.2.1 [State here the relevant operational procedures]

9.3 In-flight

9.3.1 [State here the relevant operational procedures]

9.3.2 Before and during the operations, the PIC shall closely monitor meteorological conditions within the operating areas. If the meteorological conditions deteriorate beyond the weather minima specified in Section 8.3 of this Manual, the PIC shall cease the operations immediately.

9.4 Landing

9.4.1 [State here the relevant operational procedures]

9.5 Shutdown

9.5.1 [State here the relevant operational procedures]

9.6 Post-flight

9.6.1 The PIC shall perform post-flight check on the aircraft using the [Operation Checklist (Form F)] and file a fault report if needed.

9.6.2 The PIC shall record the operations in the [Flight Record (Form A)].

9.6.3 The PIC shall report all accidents or incidents (e.g. crash, temporary incapacity of crew members or any other persons interfering with the flight operations, etc.) in accordance with Section 13 of this Manual.

10 Emergency Procedures

[State here all abnormal and emergency operational and handling procedures (including procedures for overriding the normal operating system), considering the specific operating requirements and complexity. Add extra procedures if needed.][**Note:** Applicant should determine the suitable responses and emergency procedures with reference to the procedures established by the OEM. The stated procedures shall be proven.]

10.1 Motor / Rotor Blade Failure / Loss of Power

10.1.1 [State here the relevant operational and handling procedures]

10.2 Fire

10.2.1 [State here the relevant operational and handling procedures]

10.2.2 [Post of crew member] shall call the Fire Services Department for assistance if necessary.

10.3 Loss / Degradation of C2L / Radio Failure

10.3.1 [State here the relevant operational and handling procedures]

10.4 Failure of Flight Critical Systems, Controlling Systems and Surveillance Systems

10.4.1 [State here the relevant operational and handling procedures]

10.5 Loss / Degradation of Navigation System Signal

10.5.1 [State here the relevant operational and handling procedures]

10.6 Failure of Geo-Fence / Flight Planning Failure

10.6.1 [State here the relevant operational and handling procedures]

10.7 Inability of the Aircraft to Maintain Flight Route / Current Location

10.7.1 [State here the relevant operational and handling procedures]

10.8 Low Battery / Battery Failure

10.8.1 [State here the relevant operational and handling procedures]

10.9 Flyaway

10.9.1 [State here the relevant operational and handling procedures]

10.9.2 [Post of crew member] shall take note of the following and notify the Aerodrome Control Tower (Tel: 2910 6822) as soon as possible:

- Time of the incident;
- Heading of the aircraft;
- Remaining battery of the aircraft; and
- Brief description of the aircraft (e.g. brand, model, colour, size, number of rotors, etc.)

10.9.3 [Post of crew member] shall also report to the Hong Kong Police Force at 999 immediately for necessary actions, as appropriate.

10.10 Public Encroachment

10.10.1 [State here the relevant operational and handling procedures]

10.11 Aircraft Encroachment

10.11.1 [State here the relevant operational and handling procedures]

10.12 Loss of Communication

10.12.1 [State here the relevant operational and handling procedures]

10.13 Aircraft Crash Landed on Land / Water

10.13.1 [State here the relevant operational and handling procedures]

QUALITY ASSURANCE

11 Safety Assurance and Quality Assurance

11.1 Safety Assurance

11.1.1 The Accountable Manager shall ensure that all operations are conducted in a safe manner through effective management of safety risks. Risk assessment shall be conducted prior to each flight for continuously ensuring and improving safety by identifying hazards, ensuring the implementation of necessary mitigating measures and remedial actions.

11.1.2 The Accountable Manager shall ensure that the assessments are properly conducted by competent persons of [Applicant Name] and shall properly review and document the assessment results.

11.2 Quality Assurance

11.2.1 The Accountable Manager shall conduct appropriate quality assurance activities for ensuring continuous compliance with applicable regulatory requirements stipulated in the AN(HK)O, the CAD's requirements or circulars and conditions of the Permission.

11.2.2 As one of the quality assurance activities, the Accountable Manager shall conduct a self-assessment covering all aspects of operations at least once every 2 months to identify any internal deficiencies and procedures that are not being properly implemented or that require further enhancement. A template of self-assessment checklist is attached in the Appendix [(Form H)].

11.2.3 If the Accountable Manager do not conduct operations, he should perform regular on-site supervision to ensure the operations comply with the applicable requirements and conditions.

11.2.4 All quality assurance records shall be properly kept and updated by the Accountable Manager in accordance with Chapter 6 of this Manual.

11.3 Oversight Activities by the CAD

11.3.1 The Accountable Manager shall provide all necessary support for the oversight activities conducted by the CAD, including but not limited to announced and unannounced inspections, audits, document checks and any other appropriate activities.

11.3.2 Should objective evidence be identified by the CAD illustrating non-compliance of the applicable regulatory requirements and conditions of the permission, the Accountable Manager shall submit a corrective action and implementation plan to the satisfaction of CAD within a period accepted by the CAD, which should detail the identification of the root

cause leading to the non-compliance, as well as concrete and feasible measures for preventing reoccurrence of such deficiencies.

12 Training Requirements

12.1 Training Programme

12.1.1 The Accountable Manager and all members of the flight crew and supporting crew shall get themselves familiar with the regulations in Hong Kong, the CAD's requirements or circulars, conditions of Permission, and the policies, procedures and information detailed in this Manual.

12.1.2 [State here the applicant's training policy and programme, including the content of the initial and regular trainings, frequency, etc. All members of the flight crew and supporting crew shall be trained specifically for the trial operations and the emergency procedures]

12.1.3 All training records shall be properly kept and updated by the Accountable Manager in accordance with Chapter 6 of this Manual.

13 Report and Handling of Occurrence

13.1 Internal Reporting

13.1.1 The PIC shall record any accident or incident regarding the operations in the [Occurrence Report and Follow-up Actions (Form G)] and report to the Accountable Manager within [time] after the accident or incident. The events that shall be recorded and reported by the PIC to the Accountable Manager are as follows:

- Any events described in Chapter 10 of this Manual;
- Structural damage that adversely affects the performance or flight characteristics of the aircraft;
- Unintended contact between the aircraft and persons, structures, vehicles, vessels, other aircraft, etc.;
- Temporary incapacity of crew members or any other persons interfering with the flight operations; or
- Any other events endangering, or which if not corrected would endanger, the safety of an aircraft, its occupants or any other person.
- [other accidents/incidents to be reported]

13.2 Handling of Occurrence

[State here the guidance and procedures for the reporting and handling of occurrence, including the preservation of evidence, identifying the root cause of the occurrence, submission of investigation report, implementation of corrective action, etc.]

13.2.1 Every accident or incident recorded shall be investigated to find out the root cause of the event. Preventive measures such as additional training, more stringent conditions, etc. where necessary shall be implemented by [Applicant name] for future operations. All personnel, whether directly involved in the event or not, should be briefed about the case and any lessons learnt.

13.3 Reporting to Relevant Authority

13.3.1 In case of accident or incident **which caused any damage to property or injury to person**, the Accountable Manager or PIC shall immediately report the case to the Police at **999**, and the CAD Flight Standards Office Duty Officer.

13.3.2 For any accident or incident related to the sea, the Accountable Manager or PIC shall immediately report to the Marine Department's Harbour Patrol Section Command Centre at **2385 2791 and hps@mardep.gov.hk**.

13.3.3 **Within 24 hours of any accident or incident (whether or not there was damage to third party property or injury)**, the Accountable Manager shall provide full details of the circumstances in writing to the CAD Flight Standards Office by email to **ops@cad.gov.hk**.

13.3.4 In addition, in accordance with Article 86 of the AN(HK)O, the following occurrences shall be reported under the mandatory occurrence reporting scheme:

a) any incident relating to such an aircraft or any defect in or malfunctioning of such an aircraft or any part or equipment of such an aircraft, being an incident, malfunctioning or defect endangering, or which if not corrected would endanger, the aircraft, its occupants, or any other person; and
b) any defect in or malfunctioning of any facility on the ground used or intended to be used for purposes of or in connection with the operation of such an aircraft, being a defect or malfunctioning endangering, or which if not corrected would endanger, such an aircraft or its occupants.

When making a report, the Accountable Manager or PIC shall refer to the document CAD 382 (accessible at the **CAD Website**).

13.3.5 A log of all accidents, incidents and occurrences shall be properly maintained by the Accountable Manager and shall be made available upon the request by the CAD. Upon request from the CAD, the Accountable Manager shall provide additional details and/or investigation findings within 3 calendar days, in writing by email to **ops@cad.gov.hk**.

[Reporting to other relevant authorities]

FORMS

Form A Flight Record

[For example, operational information covering operational data, crew coordination, meteorological conditions, aircraft and/or systems failures, etc.]

[Form to be prepared by the applicant]

Form B Battery Log

[Form to be prepared by the applicant]

Form C Maintenance Log

[Form to be prepared by the applicant]

Form D Site Survey Form

[Form to be prepared by the applicant]

Form E Risk Assessment Form

[Form to be prepared by the applicant]

Form F Operation Checklist

[Form to be prepared by the applicant]

Form G Occurrence Report and Follow-Up Actions

[Form to be prepared by the applicant]

Form H Self-assessment Checklist

PERMISSION TO CONDUCT TRIAL OPERATIONS OF UNCONVENTIONAL AIRCRAFT – TEMPLATE OFCHECKLIST FOR REGULAR SELF-ASSESSMENT

1. This document serves as a template of checklist for holder of Permission to Conduct Trial Operations of Unconventional Aircraft to conduct regular self-assessments.

2. **The format of this template of checklist is not prescriptive. Holder of Permission may design their own checklist(s) as they see fit.**

3. Regular self-assessment shall be conducted by the Accountable Manger at least once every 2 months. The results of each self-assessment shall be maintained in accordance with the requirement and procedures in the Operations Manual (OM) for inspection by the Civil Aviation Department ("CAD").

Part I – Basic Information

Organisation Name:_____

Permission Number:_____ Validity: From_____ to _____

Part II – Regular Self-Assessment Checklist

1. Please tick (✓) at the appropriate box(es) as you go through the checklist.
2. **If you answer "No" to any of the items, please write your corrective actions in Part G of this checklist.**

A) General Information		Yes	No	N/A	Remarks
1	Is my Application Documents up-to-date? ***[Please notify the CAD or seek CAD's approval as appropriate if "No" has been answered to any of the following items]***				
	• Company Particulars (Company Name, Address, Contact Details)				
	• Account Manager				
	• Types of Operations				
	• Operations Manual				
	• Aircraft used for Trial Operations				
	• List and Particulars of Flight Crew with copies of the relevant documents				
	• List and Particulars of Supporting Crew with copies of the relevant documents				
2	Organisation Registration Document, e.g. Business Registration Certificate (BRC)				
	• The organisation holds a valid Registration Document.				
B) Personnel and Training		**Yes**	**No**	**N/A**	**Remarks**
1	All pilots hold a valid applicable licence accepted by the CAD.				
2	Appropriate training has been provided to all members of the flight crew and supporting crew in accordance with the OM				

	• Frequency of internal training: _____				
	• Training records are properly maintained.				
C)	**Regulatory Requirements**	**Yes**	**No**	**N/A**	**Remarks**
1	Marking of Aircraft				
	• The aircraft has been marked for the purpose of identification in a way accepted by the CAD.				
2	Airworthiness and Equipment				
	• The aircraft is being maintained in accordance with the OEM's instructions for the type and model of the aircraft under the maintenance programme and maintenance arrangement accepted by the CAD.				
	• The aircraft has been equipped in accordance with the Type Certificate Data Sheet or the OEM's specifications (whichever is applicable) and the conditions relating to equipage as specified in the permission. All such equipment will perform as intended under the operating conditions for which it is designed for.				
3	Insurance				
	• A valid insurance policy that complies with the Civil Aviation (Insurance) Order (Cap.448F).				
4	Permission Conditions				
	• All operations comply with the conditions of the permission, including the restriction on public transport, carriage of dangerous goods, etc.				
D)	**Compliance with Operations Manual**	**Yes**	**No**	**N/A**	**Remarks**
1	Flight planning				
	• Site safety assessment was duly performed during the flight planning stage.				
	• A flight plan is prepared for each flight and submitted to CAD for acceptance				
	• Necessary permission from the land owner and authorities concerned has been arranged for				
2	On-Site Procedures and Pre-flight Checks				
	• The flight crew has confirmed the site safety assessment and risk assessment previously prepared are valid prior to the flight.				
	• The PIC has sufficiently briefed other crew members information about the flight, related safety measures and their respective duties prior to the flight.				
	• Cordon procedures stipulated in the Operations Manual were implemented.				
3	Flight Procedures				
	• Flight procedures stipulated in the Operations Manual were implemented.				
	• All operations were conducted in accordance with the flight plan accepted by the CAD.				
4	Emergency Procedures				
	• If an emergency situation was encountered during a flight, the emergency procedures were properly implemented in accordance with the Operations Manual.				
5	Handling and Report of Occurrence				

	Accidents or incidents have been investigated with cause identified.				
	The CAD / other relevant regulatory authorities have been properly notified about the occurrence.				
E)	**Records**	**Yes**	**No**	**N/A**	**Remarks**
	The following documents will be properly recorded and stored for two years until the permission expires.				
1	Records relating to Individual flights:				
	• Flight log, battery log and maintenance record				
	• Site Safety Assessment				
	• Safety and Risk assessment				
	• Flight plan				
	• Permission from land owners and authorities				
	• Insurance Policy				
	• Occurrence report and follow-up actions of individual flight				
2	Records relating to the maintenance of permission				
	• List of trial operations conducted and the relevant data, analysis and reports				
	• Quality assurance documents such as the self-assessment report				
	• List and particulars of the members of flight crew and supporting crew, and copies of the relevant documents ***[The record of all personnel under permission, whether current or not, shall be retained made available upon CAD's request.]***				
	• Summary of Occurrences and the follow-up actions taken				
F)	**Safety Assurance and Quality Assurance**	**Yes**	**No**	**N/A**	**Remarks**
1	Safety Assurance				
	• Safety risk assessment are conducted by competent persons prior to each flight				
	• The assessment results have been properly documented, reviewed and followed-up.				
2	Quality Assurance				
	• The self-assessment was conducted at least once every 2 months.				
	• The corrective actions proposed in the last self-assessment have been properly followed-up/completed.				
	• If the flight was not conducted by the Accountable Manager, the Accountable Manager has performed on-site supervision to ensure the compliance of the operations. Frequency: _____				

G) Corrective Action Plan

If you have answered "No" to any of the item(s) on the checklist, please write your proposed corrective action(s) below, together with the corresponding follow-up date(s) and action party/ies.

I, _____ (Name of the Accountable Manager), declare that the above assessment conducted on _____ (Date) truly reflects the circumstances of the organisation to the best of my knowledge.

_____
(Signature)

END