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<td>ALL</td>
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<td>IR</td>
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<td>ALL</td>
<td>Initial Release</td>
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Preface

This University UAS Operations Manual (“Manual”) is modeled on one that was prepared for Universities that intend to operate small unmanned aerial vehicles (i.e., “small unmanned aircraft systems” or “UAS”) under a Grant of Exemption pursuant to Section 333 of the FAA Modernization and Reform Act of 2012. Minor modifications were made to reflect the University of California’s (UC’s or “University’s”) plans for carrying out drone operations pursuant to such a Section 333 Grant of Exemption issued to UC.

This Manual does not address every possible contingency that may arise or every rule of safety and good practice. In addition to this Manual, operators of UAS are expected to be aware of their surroundings and take into account any special characteristics of the area or the mission being flown.

All faculty, staff, students, and other personnel operating under the privileges of the University’s Grant of Exemption and associated Certificates of Authorization (“COAs”), must be in compliance with all applicable Federal Aviation Regulations (“FARs”), and State and local laws. **In the event of a discrepancy between this Manual and the terms of the Exemption and COA, the conditions and limitations contained in the University’s Grant of Exemption or COA will take precedence and must be followed.**

This Manual is intended to apply to any UAS operations conducted under the University’s Section 333 Grant of Exemption, for civil operations of UAS. As a public institution, the University of California may separately obtain from the FAA public Certificates of Waiver or Authorization to authorize certain specific public operations of UAS. Any such operations must be conducted in accordance with the terms of any such public COA. While this Manual was not specifically drafted to govern such operations, it may nonetheless be helpful to individuals involved in conducting UAS operations for UC under a public COA, since it sets out procedures designed to promote safe UAS operation.

This Manual must be read in conjunction with the University’s Grant of Exemption and any applicable COAs issued to the University by the FAA. Copies of these documents should be included as an *Appendix* to this Manual before conducting UAS operations. This Manual, including any revised documents, must be made available to the FAA upon request.

These policies and procedures are intended to promote safe and efficient operation of UAS in the National Airspace System and will provide a system to aid in meeting the University’s regulatory compliance and reporting requirements. Faculty, staff, students and any vendors or contractors providing UAS support services to the University under the University’s Section 333 Grant of Exemption should use this Manual to familiarize themselves with procedures, operating requirements, and appropriate actions while operating UAS for the University.

This Manual is intended to be a convenient source of the University’s UAS procedures...
Grant of Exemption should study this entire Manual to familiarize themselves with its requirements before participating in any UAS operation on behalf of the University.

Always remember –everyone operating UAS under the University’s banner shares responsibility for compliance and ensuring safety.

Good luck and fly safely!
1. Symbols, Abbreviations and Terminology

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGL</td>
<td>Above Ground Level</td>
</tr>
<tr>
<td>AIM</td>
<td>Aeronautical Information Manual</td>
</tr>
<tr>
<td>ARP</td>
<td>Airport Reference Point</td>
</tr>
<tr>
<td>ATC</td>
<td>Air Traffic Control</td>
</tr>
<tr>
<td>ATO</td>
<td>Air Traffic Organization</td>
</tr>
<tr>
<td>C.F.R.</td>
<td>Code of Federal Regulations</td>
</tr>
<tr>
<td>COA</td>
<td>Certificate of Authorization</td>
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<tr>
<td>FCC</td>
<td>Federal Communication Commission</td>
</tr>
<tr>
<td>FAA</td>
<td>Federal Aviation Administration</td>
</tr>
<tr>
<td>FAR</td>
<td>Federal Aviation Regulation</td>
</tr>
<tr>
<td>Field Maintenance</td>
<td>Inspections and repairs made by owners/operators at a remote operating location away from their normal maintenance facility/provider</td>
</tr>
<tr>
<td>Flight Personnel</td>
<td>Includes Pilots, Observers, Sensor Operators, and Any Other Personnel Necessary for the Safe Conduct of Flight Operations</td>
</tr>
<tr>
<td>FPV</td>
<td>&quot;First Person View&quot; is a vision enhancing technology that uses an onboard camera to transmit real-time, or near real-time video from the UA to the ground control station that the UA is operated from. While FPV technologies may be used, the PIC and Observer may not rely on FPV technologies to satisfy VLOS requirements.</td>
</tr>
<tr>
<td>FSDO</td>
<td>Flight Standards District Office</td>
</tr>
<tr>
<td>GCS</td>
<td>Ground Control System</td>
</tr>
<tr>
<td>GPS</td>
<td>Global Positioning System</td>
</tr>
<tr>
<td>Grant of Exemption</td>
<td>The University’s Grant of Exemption issued Under Section 333 of the FAA Modernization and Reform Act of 2012</td>
</tr>
<tr>
<td>MTR</td>
<td>Military Training Route</td>
</tr>
<tr>
<td>NAS</td>
<td>National Airspace System</td>
</tr>
<tr>
<td>NM</td>
<td>Nautical Mile</td>
</tr>
<tr>
<td>Nonparticipating Persons</td>
<td>Persons other than Flight Personnel</td>
</tr>
<tr>
<td>Normal Flight Operation</td>
<td>Any Flight Operation Not Conducted for Training or Maintenance Purposes</td>
</tr>
<tr>
<td>NOTAM</td>
<td>Notice to Airmen</td>
</tr>
<tr>
<td>NTSB</td>
<td>National Transportation Safety Board</td>
</tr>
<tr>
<td>Observer</td>
<td>Visual Observer</td>
</tr>
</tbody>
</table>

Note that ATO-issued COAs are distinct from, and should not be confused with any Public COAs that the University may already have or that it may secure in the future. References to COAs in this Manual refer only to ATO-issued COAs.
<table>
<thead>
<tr>
<th>“Participating Persons”</th>
<th>Persons other than Flight Personnel that are essential to safe operation of the flight</th>
</tr>
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<tbody>
<tr>
<td>PIC</td>
<td>Pilot in Command</td>
</tr>
<tr>
<td>“Pre-flight Planning”</td>
<td>An activity conducted by the pilot and his/her flight crew prior to takeoff to ensure that the flight will be conducted safely and in accordance with all applicable standards and regulations. The activity includes, but is not limited to, such things as checking weather, route of flight, airspace, equipment configuration, support personnel, terrain and communications requirements.</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research and Development</td>
</tr>
<tr>
<td>SVFR</td>
<td>Special Visual Flight Rules</td>
</tr>
<tr>
<td>UA</td>
<td>Unmanned Aircraft</td>
</tr>
<tr>
<td>UAV</td>
<td>Unmanned Aerial Vehicle</td>
</tr>
<tr>
<td>UAS</td>
<td>Unmanned Aircraft System that includes the UAV and all of the associated systems necessary to operate the aircraft</td>
</tr>
<tr>
<td>VFR</td>
<td>Visual Flight Rules</td>
</tr>
<tr>
<td>VLOS</td>
<td>“Visual Line of Sight,” an aircraft is flown based on visual line of sight when the following conditions are met: (1) the aircraft is visible at all times to the pilot; (2) the pilot uses his or her natural vision (which includes vision corrected eyeglasses or contact lenses) to observe the aircraft</td>
</tr>
<tr>
<td>VMC</td>
<td>VMC or “Visual Meteorological Conditions” is an aviation flight category in which VFR flight is permitted – that is, conditions in which pilots have sufficient visibility to fly the aircraft maintaining visual separation from terrain and other aircraft.</td>
</tr>
</tbody>
</table>
2. UAS Operations Manager

2.1 General

2.1.1. The University shall designate an individual to serve as the UAS Operations Manager.

2.2 Duties and Responsibilities

2.2.1. Ensure that University faculty, staff, and students participating in University UAS operations are aware of their compliance responsibilities under the FARs, State and Local Laws, the Grant of Exemption, any applicable COAs, and this Manual.

2.2.2. Maintain a current master copy of this Manual.

2.2.3. Serve as the University’s primary point of contact with the FAA.

2.2.4. Promote compliance with FAA/NTSB reporting requirements.

2.2.5. Coordinate and promote compliance with applicable record-keeping requirements as specified under this Manual.

2.2.6. The Operations Manager may delegate functions to other personnel for UAS operations at the campus/locations where activities conducted under the University’s Section 333 Grant of Exemption may occur.

2.3 Delegation of Duties

2.3.1. The UAS Operations Manager may delegate duties and responsibilities under this Manual to qualified personnel at the University.
3. Distribution

3.1 General

3.1.1. A master copy of the current version of this Manual will be maintained by the UAS Operations Manager. A copy of this Manual will be made available (in hard copy and/or in electronic form) to:

3.1.1.1. The Pilot-in-Command (“PIC”);
3.1.1.2. Visual Observer(s);
3.1.1.3. Sensor Operators (if any);
3.1.1.4. Maintenance Personnel;
3.1.1.5. Any other University faculty, staff or student as necessary for the safe conduct of flight operations or flight planning.

3.1.2. The UAS Operations Manager will notify persons receiving copies of this Manual when there are substantive updates/revisions. The individuals specified in Section 3.1.1 are responsible for following the procedures set out in the most current version of the Manual.
4. Unmanned Aerial Vehicles

4.1 General

4.1.1. In conducting UAS operations under the University’s Section 333 Grant of Exemption, the University shall only operate the make and model of aircraft authorized by the University’s Grant of Exemption. Operation of any other UAS in FAA-regulated airspace is prohibited (unless separately authorized in accordance with FAA rules, such as under the specific terms of a public Certificate of Waiver or Authorization).

4.1.2. The term “Manufacturer’s Manual” as used in this Manual includes all manuals and publications provided by the relevant UAS manufacturer, including, but not limited to:

4.1.2.1. User Manuals;
4.1.2.2. Instruction Manuals;
4.1.2.3. Training Manuals;
4.1.2.4. Flight Manuals;
4.1.2.5. Operations Manuals;
4.1.2.6. Pilot Operating Handbooks;
4.1.2.7. Component Maintenance Manuals;
4.1.2.8. Service/Safety Bulletins;
4.1.2.9. Service Information Letters.

4.1.3. The UAS and all control systems necessary for flight shall be operated and maintained in accordance with the most recent revision of the UAS Manufacturer’s Manual.

4.2 UAS Aircraft Registration

4.2.1. All UAS operated under the University’s Grant of Exemption must be identified by serial number, registered in accordance with 14 C.F.R. part 47, and have identification (N-number) markings in accordance with 14 C.F.R. part 45, Subpart C. Markings must be as large as practicable.

4.2.2. To register UAS operated by the University, the UAS owner must submit an original (no photocopied or printed versions) Aircraft Registration Application, AC Form 8050-1, and evidence of ownership to the Aircraft Registration Branch (AFS-750).

4.2.3. Persons registering aircraft must show their title in the registration submission as evidence of the capacity in which they act.
5. **Certificate of Authorization**

5.1 **General**

5.1.1. All University UAS operations under the section Grant of Exemption must be conducted in accordance with an ATO-issued COA.

5.1.2. ATO-issued COAs are distinct from, and should not be confused with any Public COAs that the University may already have or that it may secure in the future. **References to COAs in this Manual refer only to ATO-issued COAs.**

5.2 **“Blanket” COA**

5.2.1. The FAA has provided the University a “blanket” COA along with the Grant of Exemption. The blanket COA permits flight within the United States subject to a number of restrictions that must be complied with.

5.2.2. If the proposed flight cannot be performed within the restrictions of the University’s blanket COA, then the University must apply for an ATO-issued COA that will permit the proposed flight.

5.3 **Application for a New / Amended COA**

5.3.1. The University must apply for a new or amended ATO-issued COA if it intends to conduct operations that cannot be conducted under the terms of the “blanket” COA.
6. Mission Planning

6.1 General
6.1.1. The mission planning process is an important part of risk assessment and risk mitigation.

6.2 Notice to Airmen ("NOTAM")
6.2.1. The PIC will issue a NOTAM for UAS operations where required by the University's ATO-issued COA.
6.2.2. Prior to flight, the PIC must check to see if there are any NOTAMs issued by other parties that would impact the safety of the proposed flight.

6.3 Project Packet
6.3.1. As part of the mission planning process, the PIC should prepare a "Project Packet." By way of example, The Project Packet should address the following issues:
6.3.1.1. Date and times of the flights;
6.3.1.2. Purpose of the flight;
6.3.1.3. Name and certificate number of the PIC;
6.3.1.4. Geographic location of the flights and, if applicable, a map of the area with sufficient detail to assess possible obstacles or hazards for the flight;
6.3.1.5. A listing of any airports or heliports within 5 NM of the proposed flight area as well as the location of any structures or hazards to the flight;
6.3.1.6. Name and contact information for the University UAS Operations Manager;
6.3.1.7. Maximum operating altitude;
6.3.1.8. Locations for the PIC, Observers, and Sensor Operator (if any);
6.3.1.9. Contact information for local first responders such as fire and rescue or police;
6.3.1.10. Contact information for local ATC controlling facility (if applicable);
6.3.1.11. Copy of the Grant of Exemption and of the ATO-issued COA governing the flight;
6.3.1.12. Copy of the NOTAM for the flight operations;
6.3.1.13. Sectional chart overlay, if available, of the operation area with special focus on possible air traffic deconfliction areas.

6.3.2. The Project Packet should be kept with the PIC during flight operations.

6.3.3. A form similar to Appendix H, MESA lab Mission Planning, can be used for further guidance in preparing the Project packet.

7.1 Coordination Requirements

7.1.1. It is important before flight to confirm whether your applicable COA requires the issuance of a NOTAM prior to flight. ATO issued COAs normally require the issuance of a distance (D) NOTAM. The purpose of this requirement is to provide the ATC facility with advance notification of sUAS operations in the area. The University should cancel NOTAMs when the specific UAS operations referenced in those NOTAMs are completed or will not be conducted.

7.1.2. When identifying an operational area for a proposed UAS flight, the University must evaluate whether any Military Training Routes (“MTRs”) will be affected. If the area of planned UAS operations overlaps (5 miles either side of centerline) with an MTR, the University must contact the relevant scheduling agency 24 hours in advance to coordinate and deconflict. Approval from the scheduling agency is not required. Scheduling agencies are listed in the Area Planning AP/1B Military Planning Routes North and South America. If unable to gain access to AP/1B, the University may contact the FAA via email at mailto:9-AJV-115-UASOrganization@faa.gov with the IR/VR routes affected and the FAA will provide the scheduling agency information. If prior coordination and deconfliction does not take place 24 hours in advance, the University must remain clear of all MTRs.

7.2 Communication Requirements

7.2.1. When operating in the vicinity of an airport without an operating control tower, the University will announce its operations in accordance with the FAA Aeronautical Information Manual (AIM) 4-1-9 Traffic Advisory Practices at Airports without Operating Control Towers, a copy of which is located in Appendix G of this Manual.
8. Flight Personnel

8.1 General

8.1.1. The term “Flight Personnel” includes pilots, observers, sensor operators, and any other personnel necessary for the safe conduct of flight operations.

8.1.2. All Flight Personnel should be fully qualified to perform their duties safely and effectively.

8.1.3. The University may rely upon prior training and experience for purposes of qualifying Flight Personnel, to the extent that prior training and experience meets the minimum requirements of this Manual, including being logged in a manner consistent with 14 C.F.R. § 61.51(b).

8.2 Flight Personnel Health

8.2.1. All Flight Personnel must be in a condition fit to perform their duties safely under this Manual. No person may act as a member of the Flight Personnel if they are under the influence of any drug, alcohol, or medication likely to impair their performance of duties.
9. Pilot

9.1 General

9.1.1. The Pilot of the UAS shall be the Pilot-in-Command ("PIC") who has all the responsibility and authority of the PIC as described by 14 C.F.R. 91.3, Responsibility and Authority of the Pilot in Command.

9.1.2. The PIC has ultimate responsibility for the safe operation of the UAS. As a result, the PIC has the final decision on whether to initiate or terminate any flight.

9.2 Duties and Responsibilities

9.2.1. Pilots will evaluate all missions. On occasion, pilots may be asked to perform a mission that, in their judgment, is not safe. It is the pilot’s responsibility to recognize and refuse all such missions. The pilot’s word is final as to whether the flight is feasible and can be conducted in a safe and efficient manner.

9.2.2. If at any time, the UAS Operations Manager feels that a flight or operation is unsafe and requests that it be terminated for safety reasons, it is the pilot’s responsibility to comply with such requests in a professional manner.

9.2.3. Before departure, the pilot must understand the mission request and have all applicable documentation at the ground control station. Additionally, the pilot is required to be aware of weather forecasts, winds, hazards, temporary flight restrictions, and all pertinent information necessary to perform the mission.

9.3 Qualifications

9.3.1. The PIC must hold one of the following current pilot certificates:

9.3.1.1. Commercial;

9.3.1.2. Private;

9.3.1.3. Recreational; or

9.3.1.4. Sport.

9.3.2. The PIC must also hold one of the following:

9.3.2.1. A current FAA airman medical certificate; or

9.3.2.2. Valid U.S. driver's license issued by a state, the District of Columbia, Puerto Rico, a territory, a possession, or the Federal government.

9.3.3. The PIC shall maintain an understanding of the normal, abnormal and emergency procedures of the UAS.

9.3.4. The PIC shall maintain an appropriate level of understanding of the FARs applicable to the airspace where UAS operations will occur.
9.3.5. No one may act as PIC unless they have read and familiarized themselves with the contents of this Manual, as well as the Manufacturer's Manual for the UAS to be flown.

9.4 Flight Review

9.4.1. The PIC must meet the flight review requirements specified in 14 C.F.R. § 61.56.

9.5 Initial Training

9.5.1. The PIC must be able to safely operate the UAS in a manner consistent with how the UAS will be operated under the University's Grant of Exemption, including evasive and emergency maneuvers and maintaining appropriate distances from persons, vessels, vehicles, and structures.

9.5.2. Training flights must be conducted in accordance with the procedures in Section 18 of this Manual.

9.6 Currency

9.6.1. It is the responsibility of the PIC to ensure that he or she has current experience with the UAS used in any flight operation.

9.6.2. In order to be current, the PIC must have conducted and logged at least 3 launch and 3 recovery operations within the previous ninety 90 days.

10.1 Visual Observer Duties and Responsibilities

10.1.1. The Visual Observer ("Observer") plays a critical role in assisting the PIC in maintaining situational awareness and complying with his/her "see-and-avoid" duties. Observers must maintain sufficient proximity to the PIC and to the flight operation to exercise "see-and-avoid" activities by scanning the area around the UAS for potentially conflicting traffic or other hazards to the safety of the flight.

10.1.2. Observers must maintain verbal contact with the PIC at all times and be able to advise the PIC of any hazards that arise during flight. Electronic messaging or texting is not permitted during flight operations.

10.1.3. The Observer shall maintain visual contact with the aircraft and maintain diligent visual lookout for any airborne or ground-based threats.

10.2 Qualifications

10.2.1. Observers shall have sufficient knowledge of the airspace in which the work detailed in this Manual will be performed to permit them to adequately assess the risks posed by other aircraft or objects. At a minimum, Observers will have knowledge about the rules and responsibilities described in 14 C.F.R. § 91.111, § 91.113, and § 91.115.

10.2.2. Observers shall have knowledge of basic VFR weather minimums.

10.2.3. Observers shall maintain a thorough understanding of all normal, abnormal, and emergency operational aspects of the UAS.

10.2.4. No one may act as an Observer unless they have read and familiarized themselves with the contents of this Manual, as well as the Manufacturer's Manual for the UAS to be flown.

10.3 Sensor Operator

10.3.1. It is the duty of the Sensor Operator to control and direct the operation of any remote sensing equipment or mission payloads carried by the UAS.

10.3.2. The Sensor Operator does not have the authority to require the PIC to maneuver the aircraft in any unsafe manner, or in any manner that violates the FARs.

10.3.3. No one may act as a Sensor Operator unless they have read and familiarized themselves with the contents of this Manual, as well as any additional manuals for the sensor to be operated.
11. Sterile Area and Airspace Control

11.1 Area Security

11.1.1. UAS operations conducted under this Manual will be limited to controlled areas where only Flight Personnel or persons essential to the safe operation of the flight will be allowed.

11.1.2. No UAS operations will occur until the area is clear and the Separation and Distance requirements of this Section are complied with.

11.1.3. Flight Personnel shall conduct a ground inspection of the area of operations for any hazards to the safe conduct of the flight operation. These hazards include, but are not limited to:

11.1.3.1. Any previously identified hazards listed in the Project Packet;

11.1.3.2. Previously unidentified ground based obstacles;

11.1.3.3. Previously unidentified wires or guidelines.

11.2 Separation and Distances

11.2.1. The UAS may not operate within 5 NM of an airport reference point (“ARP”) as denoted in the current FAA Airport/Facility Directory (“AFD”) or for airports not denoted with an ARP, the center of the airport symbol as denoted on the current FAA-published aeronautical chart, unless a letter of agreement with that airport’s management is obtained by the University person responsible for doing the advance groundwork or otherwise permitted by a COA issued to the University. The letter of agreement with the airport management must be made available to the FAA or any law enforcement official upon request.

11.2.2. The UAS may not be operated less than 500 feet below or less than 2,000 feet horizontally from a cloud or when visibility is less than 3 statute miles from the PIC.

11.2.3. The UAS must remain clear and yield the right-of-way to all manned aviation operations at all times (including, but not limited to, ultralight vehicles, parachute activities, parasailing activities, hang gliders, etc.). The UAS will land as soon as safely possible upon identification of any manned operation in the immediate vicinity of UAS operations.

11.2.4. The UAS may not be operated under the Section 333 exemption by the PIC from any moving device or vehicle.

11.2.5. The UAS may not be operated over congested or densely populated areas. These areas include but are not limited to the yellow areas depicted on World Aeronautical charts, Sectional Aeronautical Charts, or Terminal Area Charts. However, aeronautical charts may not reflect pertinent local information (i.e., sparsely populated areas may be
within the above-noted "yellow-areas"). Ultimately, it is the PIC's responsibility to maintain minimum safe altitudes required by 14 C.F.R. § 91.119 and the University's Grant of Exemption.

11.2.6. Flight operations must be conducted at least 500 feet from all nonparticipating persons, vessels, vehicles, and structures unless:

11.2.6.1. Barriers or structures are present that sufficiently protect nonparticipating persons from debris in the event of an accident. Flight Personnel shall ensure that nonparticipating persons remain under such protection. If a situation arises where nonparticipating persons leave such protection and are within 500 feet of the aircraft, flight operations must cease immediately and/or;

11.2.6.2. The UAS is operated near vessels, vehicles or structures where the land owner/controller has granted permission and/or the PIC has made a safety assessment of the risk of operating closer to those objects and;

11.2.6.3. Operations near the PIC, Observer, and other participating persons do not present an undue hazard to the PIC, Observer, or other persons.

11.2.7. When considering how to immediately cease operations, the primary concern is the safety of nonparticipating persons.

11.3 See-and-Avoid / Visual Line-of-Sight ("VLOS")

11.3.1. To ensure that the UAS does not become a hazard to persons, property, or any other aircraft, it is critical to know where the UAS is located at all times. This is accomplished through vigorous application of the principles of see-and-avoid and VLOS operations.

11.3.2. All flight operations are conducted based on see-and-avoid principles. This is accomplished through the use of Observers as well as ensuring that the PIC has an uninterrupted VLOS to the UAS at all times. The UA must be operated within VLOS of the PIC at all times. This requires the PIC to be able to use human vision unaided by any device other than corrective lenses, as specified on the PIC's FAA issued-airman medical certificate or U.S. driver's license. If, at any time the PIC loses VLOS with the UAS, the flight must be terminated in accordance with Section 13 of this Manual.

11.3.3. All flights must be conducted during daylight hours in visual meteorological conditions ("VMC").

11.3.4. Flights under special visual flight rules ("SVFR") are not authorized.
11.4 Take-off and Landing Zones

11.4.1. All operations require a designated take-off zone, landing zone, and lost link/emergency termination zone; however, the pilot retains the right to change or modify that selection if potentially unsafe conditions exist.

11.4.2. These zones may be the same location or different locations depending on the needs of the mission.

11.4.3. Prior to operation, these zones shall be cleared of all nonparticipating persons.

11.4.4. Markings and other appropriate measures will be taken to ensure that persons do not enter these areas while the operation is in progress.
12. Normal Flight Operations

12.1 General

12.1.1. A Normal Flight Operation is any flight that is not conducted for training or maintenance purposes.

12.1.2. Normal Flight Operations are limited to speeds at or below the amount specified in the Grant of Exemption or ATO COA. In no case shall the UA be operated at airspeed greater than the maximum UA operating airspeed recommended by the Manufacturer’s Manual.

12.1.3. The PIC is prohibited from beginning a flight unless (considering wind and forecast weather conditions) there is enough available power for the UA to conduct the intended operation and to operate with sufficient reserve power as recommended by the manufacturer.

12.1.4. The UAS may not be flown at an altitude that exceeds the maximum operating AGL in the applicable COA without prior written authorization and approval from the FAA.

12.2 Operational Requirements

12.2.1. Before any flight operations is conducted under the provisions of this Manual, the Operator will obtain permission to conduct these operations from property owners and/or local officials as necessary or appropriate. All operations shall be conducted over property where permission has been granted from the owner/ controller or authorized representative. The UAS must be identified by serial number, registered in accordance with 14 C.F.R. part 47, and have identification (N-number) markings in accordance with 14 C.F.R. part 45, Subpart C. Markings must be as large as practicable.

12.2.2. Before conducting operations, the radio frequency spectrum used for operation and control of the UAS must comply with Federal Communication Commission (“FCC”) or other appropriate government oversight agency requirements.

12.3 UAS Airworthiness

12.3.1. Prior to each flight the PIC shall inspect the UAS to ensure it is in a condition for safe flight. If provided, the PIC shall use the manufacturer’s preflight checklist for inspecting the UAS. If a checklist is not provided by the manufacturer, the PIC shall use those parts of the Normal Flight Operations Procedure Checklist in Appendix F of this Manual as applicable.

12.3.2. If the inspection reveals a condition that affects the safe operation of the UAS, the aircraft is prohibited from operating until the necessary maintenance has been performed and the UAS is found to be in a condition for safe flight.
12.3.3. The Ground Control Station, if used, must be included in the preflight inspection.

12.3.4. All maintenance and alterations should be properly documented as required by Section 15 of this Manual.

12.4 Documentation

12.4.1. All necessary documentation must be kept with the PIC during Normal Flight Operations, including:

- Manufacturer’s Manuals;
- This Manual;
- Aircraft Registration;
- Copy of the Grant of Exemption and applicable COA;
- Project Packet.

12.5 Pre-Flight Planning

12.5.1. Weather

12.5.1.1. The PIC will obtain a local weather forecast covering the time of flight.

12.5.1.2. The PIC will check wind velocity and direction on-site prior to flight.

12.5.1.3. VFR Weather minimums will be obeyed at all times.

12.5.2. NOTAMS

12.5.2.1. The PIC will check for any Temporary Flight Restrictions prior to flight.

12.5.2.2. The PIC will check for the issuance of any GPS NOTAMs prior to flight.

12.5.3. Briefings

12.5.3.1. Briefing is an essential part of conducting UAS operations in a safe and efficient manner. On the day of the flight, prior to the start of UAS operations, the PIC shall brief all Flight Personnel on the goals, objectives and key safety considerations of the planned UAS operation. The intent is to cover all operation aspects of the mission and to promote full understanding among all Flight Personnel. The guidelines for conducting Flight Personnel briefings are listing below. Possible subjects to cover in a briefing may include:

12.5.3.1.1. Abnormal and emergency flight procedures as defined in Section 13 of this Manual and how they will be applied to the specific mission;
12.5.3.1.2. The roles and responsibilities of the PIC, Observer, and Sensor Operator for the specific mission;
12.5.3.1.3. The communication plan;
12.5.3.1.4. The contingency plan;
12.5.3.1.5. Weather reports;
12.5.3.1.6. Proximity to potential air traffic;
12.5.3.1.7. Abort parameters in accordance with the Manufacturer’s Manual;
12.5.3.1.8. Threats to current mission.

12.5.3.2. Public safety should be addressed at every briefing to mitigate all risks from University flight operations.

12.6 Take-Off/Flight

12.6.1. All flight operations will be conducted in accordance with the applicable Manufacturer’s Manual.
12.6.2. All Flight Personnel shall remain at his or her station as listed in the Flight Operation Plan during takeoff, landing, recovery, and other critical phases of flight, except when performing those duties required for the safe operation of the aircraft.
12.6.3. The PIC shall ensure that the UA maintains a sufficient power reserve as recommended by the manufacturer.
12.6.4. The PIC shall terminate the flight and land the UA at any time it appears that the required battery reserves cannot be maintained. When terminating a flight, the primary concern shall be the safety of nonparticipating persons.

12.7 Sensor Manipulation

12.7.1. If it has been determined that the mission can be safely flown without a separate Sensor Operator, the PIC may not adjust or manipulate the sensor in any way unless the aircraft is in a GPS-assisted or autonomous flight mode where there is no danger of collision or loss of control.
12.7.2. Sensor manipulation/adjustment activities must be coordinated with the Observer to ensure adequacy of see-and-avoid procedures and minimum safe distance requirements.

12.8 Recovery

12.8.1. All UAS landing and recovery will be accomplished in accordance with the Manufacturer’s Manual.
12.8.2. The UAS landing and recovery will take place at the pre-designated landing zone.
12.9 Shutdown/Post-Flight

12.9.1. UAS shutdown and post flight actions will be taken in accordance with the Manufacturer’s Manual.

12.9.2. A member of the Flight Personnel shall complete a post-flight summary using the Post Flight Summary Form contained in Appendix A of this Manual. The summary shall include, but not be limited to:

12.9.2.1. Date;
12.9.2.2. Location of Operation (including city/name and latitude/longitude);
12.9.2.3. PIC Name and Pilot’s License Number;
12.9.2.4. Observer Name;
12.9.2.5. Sensor Operator Name (if any);
12.9.2.6. Launch and Recovery Time;
12.9.2.7. Duration of Operation;
12.9.2.8. Any issues encountered during the operation that should be addressed before subsequent operations.

12.9.3. The UAS Operations Manager or PIC shall complete an submit on-line to the FAA an incident report using a form substantially similar to the Incident Report Form contained in Appendix B of this Manual documenting any safety related incidents, including any mechanical irregularities or malfunctions encountered during the flight operation.

12.9.4. In the event a lost-link occurs during the UAS operation, the Operations Manager or PIC shall document the event in the Data Link Discrepancy Log contained in Appendix C of this Manual.

12.9.5. Flight Personnel shall also take the following post-flight actions:

12.9.5.1. Conduct post-flight aircraft inspection as recommended in the Manufacturer’s Manual;

12.9.5.2. Make an entry in a UAS Flight Log using the form in Appendix E of this Manual.
13. Abnormal and Emergency Flight Operations

13.1 General

13.1.1. The recommended procedures for addressing various types of emergencies and critical situations are provided by this Section and in the Manufacturer’s Manual. Pilots and all Flight Personnel engaged in UAS operations under this Manual should familiarize themselves with procedures given in this Section and the Manufacturer’s Manual, and be prepared to take appropriate action should an emergency arise.

13.2 Policy and Procedure

13.2.1. It is the responsibility of the PIC to adequately brief all Flight Personnel on hazards identified during a pre-flight risk assessment.

13.2.2. The Pre-flight brief shall cover the roles and responsibilities of all Flight Personnel in the event of an in-flight emergency.

13.3 Emergency Procedures

13.3.1. In an emergency situation involving the safety of persons or property, which requires immediate decisions and actions, the PIC or any other appropriate Flight Personnel member may take action that is considered necessary under the circumstances to ensure safety. Flight Personnel may deviate from prescribed operations procedures and methods, weather minimums, FARs, this Manual, etc., to the extent necessary, in the interest of safety. Flight Personnel shall keep the appropriate ATC facilities fully informed when an in-flight UAS emergency could potentially impact operations of aircraft in navigable airspace.

13.3.2. The University shall investigate and document any such deviations using an Incident Report form substantially similar to that contained in Appendix B of this Manual.

13.4 System Failures/ Equipment Malfunctions

13.4.1. Response to UAS system failures and malfunctions shall be in accordance with the flight operation’s predetermined, site-specific contingency plans and abort procedures for emergency flight termination, as well as any additional guidance provided by the Manufacturer’s Manual.

13.4.2. System failures shall be documented using a form substantially similar to the Incident Report form in Appendix B of this Manual.

13.5 Lost-Link Procedures

13.5.1. Lost-link response procedures will be in accordance with the flight operation’s predetermined, site-specific contingency plans and abort procedures for emergency flight termination, as well as any additional guidance provided by the Manufacturer’s Manual.
13.5.2. Lost-links shall be recorded in a form substantially similar to the Data Link Discrepancy form contained in Appendix C of this Manual.
14. Accident/Incident Reporting

14.1 FAA Reporting
14.1.1. Any incident, accident, or flight operation that transgresses the lateral or vertical boundaries of the operational area as defined by an applicable COA will be reported by the PIC to the FAA’s UAS Integration Office (AFS-80) within 24 hours.

14.1.2. The University shall comply with the periodic reporting requirements contained in the applicable COA.

14.2 NTSB Reporting
14.2.1. The PIC shall report accidents in which a person suffers death or serious injury or where the aircraft receives substantial damage and incidents which could affect the safety of operations to the NTSB’s 24-hour Response Operations Center at (844) 373-9922, or as otherwise prescribed on the NTSB website (http://www.ntsb.gov) and shall provide the following applicable information:

- 14.2.1.1. Type, nationality, and registration marks of the UAS;
- 14.2.1.2. Name of owner, and operator of the UAS;
- 14.2.1.3. Name of the PIC;
- 14.2.1.4. Date and time of the accident;
- 14.2.1.5. Last point of departure and point of intended landing of the UAS;
- 14.2.1.6. Position of the UAS with reference to some easily defined geographical point;
- 14.2.1.7. Number of any persons injured, if any;
- 14.2.1.8. Nature of the accident, the weather and the extent of damage to the UAS, so far as is known;
- 14.2.1.9. A description of any dangerous articles or materials carried;
- 14.2.1.10. Any other information required on the NTSB’s website.

14.3 Consultation with Campus Counsel
14.3.1. The PIC shall immediately notify campus counsel of accidents that the PIC has reported to the NTSB as set forth in 14.2.1, above.
15. UAS Maintenance Procedures

15.1 General

15.1.1. Maintenance, whether scheduled or unscheduled, on components used in the operation of the UAS, shall be performed by a qualified maintenance technician with sufficient skills and understanding of the aircraft and its systems and components to perform maintenance operations in accordance with the appropriate manufacturer’s recommendations in the Manufacturer’s Manual.

15.1.2. The UAS must be maintained in accordance with any Airworthiness Directive or required manufacturer’s Safety/Service Bulletin.

15.2 Frequency of Maintenance Inspections

15.2.1. The period between routine maintenance inspections of the UAS and its operational components shall be in accordance with the appropriate Manufacturer’s Manual.

15.3 Documenting Maintenance

15.3.1. All maintenance performed on an aircraft shall be documented and recorded in a Maintenance Log in Appendix D, including any malfunctions encountered, parts removed, parts replaced, and whether the aircraft is airworthy after any maintenance procedure. The UAS Maintenance Log entry shall contain:

15.3.1.1. Date the work was performed;
15.3.1.2. Make, model, and serial or N-number of the aircraft;
15.3.1.3. Maintenance technician name;
15.3.1.4. Aircraft total time;
15.3.1.5. Details of work performed;
15.3.1.6. Details of any modifications to the aircraft;
15.3.1.7. Details and total time of any replacement components;
15.3.1.8. Details of any malfunctions encountered;
15.3.1.9. Software or firmware version number if the existing software or firmware is updated, removed, or reinstalled;
15.3.1.10. Status of the aircraft once maintenance procedures are completed;
15.3.1.11. Any other matter affecting the aircraft’s readiness for flight.

15.3.2. Maintenance Technician

15.3.2.1. No one shall conduct maintenance on a UAS unless they have sufficient skills and understanding of the aircraft and its systems and components to perform the
maintenance operation AND UAS Functional Test Flights

15.3.3. Any maintenance action or alteration performed that affects the aircraft’s operation or flight characteristics, e.g., replacement of a flight critical component, must undergo a functional test flight in accordance with this Manual.

15.3.4. Components that will require flight-testing after their replacement will include, but not limited to:

15.3.4.1. Airframe/Structural Components;
15.3.4.2. Flight Controller or Autopilot/Stability Systems;
15.3.4.3. Radio Transmitters;
15.3.4.4. Radio Transmitter Antennas;
15.3.4.5. Power Distribution Boards;
15.3.4.6. Power Wiring Harnesses;
15.3.4.7. Servo Wiring or Flight Controller Wiring;
15.3.4.8. Motors;
15.3.4.9. Actuators or Servos;
15.3.4.10. Controller Hardware, Software, or Firmware.

15.3.5. Flight tests will comply with all provision of this Manual and shall:

15.3.5.1. be adequate to ensure the safe and compliant operating nature of the aircraft;
15.3.5.2. Initially be conducted at a low altitude.

15.3.6. The PIC whom conducts the functional flight test must make an entry in the aircraft Flight Log using the form in Appendix E of this Manual.
16. Privacy

16.1 General

16.1.1. The University is committed to respecting the privacy rights of third parties impacted by flight operations.

16.1.2. No flight will be authorized if the operation would be in violation of any local, state, or federal law or regulation regarding privacy.
17. Recordkeeping

17.1 General

17.1.1. The University will document all UAS activities conducted under the provisions of this Manual as required to comply with the reporting requirements of the Exemption and the ATO COA.

17.1.2. All records required to be kept under this Manual shall be retained in accordance with UC records maintenance policy.

17.2 Post Flight Summaries

17.2.1. The University will maintain Post Flight Summaries using manufacturer provided checklists or, if unavailable, using the Post Flight Summary form in Appendix A of this Manual. The Post Flight Summary form may be used to establish the operational history of the UAS, as necessary.

17.3 Incident Reports

17.3.1. The University will maintain a record of any accidents, incidents or deviations encountered using an Incident Report form in Appendix B of this Manual.

17.4 Lost-Link Report

17.4.1. The University will maintain records of any lost-link encountered using the Lost-Link form in Appendix C of this Manual.

17.5 Maintenance Records

17.5.1. The University will maintain records of all required UAS maintenance, preventative maintenance, inspections, repairs, modifications, alterations and overhauls using the Maintenance Log in Appendix D of this Manual.

17.6 Flight Logs

17.6.1. The University shall maintain a record of all flights using the Flight Log in Appendix E of this Manual.

17.7 FAA Reporting Requirement

17.7.1. The University shall document all operations associated with UAS activities as required by the applicable COA. The University will be required to submit specific information identified in the COA to the FAA on a periodic basis.

17.7.2. To ensure compliance with FAA reporting requirements under a University’s COA, the following information must be maintained for each UAS flight:

17.7.2.1. Operator name, and exemption/aircraft registration no.’s;

17.7.2.2. UAS types and models;
17.7.2.3. All operating locations, to include location city/name and latitude longitude;
17.7.2.4. Number of flights (per location, per aircraft);
17.7.2.5. Total aircraft operational hours;
17.7.2.6. Takeoff and Landing damages;
17.7.2.7. Equipment malfunctions. Reportable functions include, but are not limited to the following:
   17.7.2.7.1. On-board flight control system;
   17.7.2.7.2. Navigation system;
   17.7.2.7.3. Powerplant failure in flight;
   17.7.2.7.4. Fuel system failure;
   17.7.2.7.5. Electrical system failure;
   17.7.2.7.6. Control station failure.
17.7.2.8. The number and duration of lost link events (control, performance and health monitoring, or communications) per UA, per flight.
17.7.2.9. Any other information required by an applicable COA.
18. Training Flights

18.1 General

18.1.1. Training flights are performed for the sole purpose of either gaining experience flying/observing UASs in general or in meeting currency requirements for specific UASs used to perform operations under this Manual.

18.1.2. Training will provide Flight Personnel with the ability to safely work around a UAS and identify and mitigate risks and potential hazards that could be encountered. Before performing any UAS operations described in this Manual, all Flight Personnel must have training appropriate to the specific UAS used and sufficient to perform their assigned tasks for the flight.

18.1.3. A pilot may operate a UAS under this Section for limited training purposes even if he or she does not meet the requirements for acting as PIC during UAS operations performed under this Manual.

18.1.4. All training flights must be terminated immediately if any person or vehicle not involved in the training approaches within 500 feet of the UAS.

18.1.5. In all other respects, training flights shall be conducted in accordance with the Normal, Abnormal and Emergency Flight Operation requirements of this Manual, including but not limited to:

18.1.5.1. UA Proximity and Distance Set-off Requirements;
18.1.5.2. UA Airworthiness Inspections;
18.1.5.3. Maximum Operating Airspeed;
18.1.5.4. Maximum Operating Altitude;
18.1.5.5. Reserve Battery Power;
18.1.5.6. ATC Coordination/Communication;
18.1.5.7. NOTAMs;
18.1.5.8. Recordkeeping;
18.1.5.9. FAA/NTSB Reporting and Notification.
# Appendix A  Post Flight Summary Form

## Flight Log

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## Flight Information

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<td>Flight Plan</td>
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<td>PIC</td>
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## Pre-Flight Checklist

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<td>Launch System Check</td>
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<td>Physical Surfaces Check</td>
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<td>GCS Initialized</td>
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<td>Transmitter Battery Level</td>
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<td>Transmitter Check</td>
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<td>Airspeed Sensor Active</td>
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**Notes**

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A-2
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## Appendix C  Data Link Discrepancy Log

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C-1
### Appendix D  \hspace{1cm} Maintenance Log

**MAINTENANCE LOG**

<table>
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<tr>
<th>Date</th>
<th>Type of work</th>
<th>Make, Model, Serial / Number of AC</th>
<th>Removed (old) Part number or Serial number</th>
<th>Installed (new) Part number or Serial number</th>
<th>Description of Work or Inspection / Signature</th>
<th>Component Name</th>
<th>Accumulated Time</th>
<th>Status of AC</th>
<th>Tech Name</th>
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Total system time to bring forward.
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## Appendix E  Flight Log

### FLIGHT LOG

<table>
<thead>
<tr>
<th>Date</th>
<th>Purpose of Flight</th>
<th>Pilot in Command (PIC)</th>
<th>Power on time or engine start</th>
<th>Power off time or engine stop</th>
<th>Flighttime this flight</th>
<th>Description of flight or mishap</th>
<th>Number of Launches and landings</th>
<th>Total system time</th>
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Note: Table system time is being forward.
Appendix F

Normal Flight Operations Checklist

Flights Date: ____________________________
Prepared by: ____________________________
Aircraft: _______________________________
Mission Name: __________________________

Complete Prior to Mission Operations

**Mission Preparation (24 hours prior)**

<table>
<thead>
<tr>
<th>#Mission Plan</th>
<th>New</th>
<th>Revised</th>
<th>No Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Mission Plan</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>*Risk Analysis Score</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Weather Report</td>
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<tr>
<td>*Aircraft Checklist</td>
<td></td>
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<tr>
<td>*Payload Checklist</td>
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<tr>
<td>Simulated Flight Time</td>
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</tbody>
</table>

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<thead>
<tr>
<th>Batteries Charged</th>
<th>Battery #</th>
<th>Voltage</th>
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</table>

Complete During Mission Operations

**On-Site Setup**

1. *Brief Flight Plan with Crew
   1a. Flight Plan
   1b. Crew Responsibilities
   1c. Communication Plan
   1d. Contingency Plans
   1e. Air Traffic Conditions
   1f. Abort Conditions
2. Area is clear and secure
   2a. Identify LRPs and ensure they are free of obstacles and marked for safety
   2b. Identify DCPs and FTPs, and ensure they are free of obstacles and marked for safety
   2c. Ensure Area is clear of nonparticipating persons
3. Review Weather Conditions
   3a. Wind speed within operational limits
   3b. Weather conditions within operational limits
4. *SUAS Set-up Checklist

**Pre-Launch Checklist**

*Document Flight Parameters in Flight Log
- All SUAS systems Operational
- All crew in position and ready
- Surrounding area and airspace clear
  
  Clear for Launch

**Landing Checklist**

- SUAS in position
- Landing Location is free of obstacles
- All crew in position and ready
  
  Initiate Landing Sequence

**Post-Flight Checklist**

*Document Flight Results
- Remove battery/fuel
*Post-Flight Inspection
*SUAS Tear-down Checklist

Post Mission Procedures

*Review all mission documentation
*Complete missing information
*Conduct Equipment Return Checklist
*Complete all Post-Flight Documentation
*Document all necessary maintenance

* refers to external documentation

LRPs – Launch and/or Recovery Points
LLPs – Lost Link Points
DCPs – Divert/Contingency Points
FTPs - Flight Termination Points

Compile packet and submit to Safety Review Board
File NOTAM (if necessary)
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Appendix G  Traffic Advisory Practices for Airports without Control Towers

AIM  4/3/14


(See TBL 4–1–1.)

a. Airport Operations Without Operating Control Tower

1. There is no substitute for alertness while in the vicinity of an airport. It is essential that pilots be alert and look for other traffic and exchange traffic information when approaching or departing an airport without an operating control tower. This is of particular importance since other aircraft may not have communication capability or, in some cases, pilots may not communicate their presence or intentions when operating into or out of such airports. To achieve the greatest degree of safety, it is essential that all radio-equipped aircraft transmit/receive on a common frequency identified for the purpose of airport advisories.

2. An airport may have a full or part-time tower or FSS located on the airport, a full or part-time UNICOM station or no aeronautical station at all. There are three ways for pilots to communicate their intention and obtain airport/traffic information when operating at an airport that does not have an operating tower: by communicating with an FSS, a UNICOM operator, or by making a self-announce broadcast.

3. Many airports are now providing completely automated weather, radio check capability and airport advisory information on an automated UNICOM system. These systems offer a variety of features, typically selectable by microphone clicks, on the UNICOM frequency. Availability of the automated UNICOM will be published in the Airport/Facility Directory and approach charts.

b. Communicating on a Common Frequency

1. The key to communicating at an airport without an operating control tower is selection of the correct common frequency. The acronym CTAF which stands for Common Traffic Advisory Frequency, is synonymous with this program. A CTAF is a frequency designated for the purpose of carrying out airport advisory practices while operating to or from an airport without an operating control tower. The CTAF may be a UNICOM, MULTICOM, FSS, or tower frequency and is identified in appropriate aeronautical publications.

4–1–2

Services Available to Pilots
TABLE 4–1–1
Summary of Recommended Communication Procedures

<table>
<thead>
<tr>
<th>Facility at Airport</th>
<th>Frequency Use</th>
<th>Communication/Broadcast Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. UNICOM (No Tower or FSS)</td>
<td>Communicate with UNICOM station on published CTAF frequency (122.7, 122.8, 122.75, 122.975, or 123.0). If unable to contact UNICOM station, use self-announce procedures on CTAF.</td>
<td>Before taxiing and before taxiing on the runway for departure. Before or after the runway for departure. 10 miles out. Entering downwind, base, and final. Leaving the runway.</td>
</tr>
<tr>
<td>2. No Tower, FSS, or UNICOM</td>
<td>Self-announce on MULTICOM frequency 122.9.</td>
<td>Before taxiing and before taxiing on the runway for departure. 10 miles out. Entering downwind, base, and final. Leaving the runway. Departing final approach fix (name) or on final approach segment inbound.</td>
</tr>
<tr>
<td>4. FSS Closed (No Tower)</td>
<td>Self-announce on CTAF.</td>
<td>Before taxiing and before taxiing on the runway for departure. 10 miles out. Entering downwind, base, and final. Leaving the runway.</td>
</tr>
<tr>
<td>5. Tower or FSS not in operation</td>
<td>Self-announce on CTAF.</td>
<td>Before taxiing and before taxiing on the runway for departure. 10 miles out. Entering downwind, base, and final. Leaving the runway.</td>
</tr>
</tbody>
</table>

2. The CTAF frequency for a particular airport is contained in the AFD, Alaska Supplement, Alaska Terminal Publication, Instrument Approach Procedure Charts, and Instrument Departure Procedure (DP) Charts. Also, the CTAF frequency can be obtained by contacting any FSS. Use of the appropriate CTAF, combined with a visual alertness and application of the following recommended good operating practices, will enhance safety of flight into and out of all uncontrolled airports.

c. Recommended Traffic Advisory Practices

1. Pilots of inbound traffic should monitor and communicate as appropriate on the designated CTAF from 10 miles to landing. Pilots of departing aircraft should monitor/communicate on the appropriate frequency from start-up, during taxi, and until 10 miles from the airport unless the CFRs or local procedures require otherwise.

2. Pilots of aircraft conducting other than arriving or departing operations at altitudes normally used by arriving and departing aircraft should monitor/communicate on the appropriate frequency while within 10 miles of the airport unless required to do otherwise by the CFRs or local procedures. Such operations include parachute jumping/dropping, en route, practicing maneuvers, etc.

REFERENCE:
AIM, Parachute Jump Aircraft Operations, Paragraph 3–3–8

d. Airport Advisory/Information Services Provided by a FSS

1. There are three advisory type services provided at selected airports.

(a) Local Airport Advisory (LAA) is provided at airports that have a FSS physically located on the airport, which does not have a control tower or where the tower is operated on a part-time basis. The CTAF for LAA airports is disseminated in the appropriate aeronautical publications.

Services Available to Pilots

4–1–3
(b) Remote Airport Advisory (RAA) is provided at selected very busy GA airports, which do not have an operating control tower. The CTAF for RAA airports is disseminated in the appropriate aeronautical publications.

(c) Remote Airport Information Service (RAIS) is provided in support of special events at nontowered airports by request from the airport authority.

2. In communicating with a CTAF FSS, check the airport's automated weather and establish two-way communications before transmitting outbound/inbound intentions or information. An inbound aircraft should initiate contact approximately 10 miles from the airport, reporting aircraft identification and type, altitude, location relative to the airport, intentions (landing or over flight), possession of the automated weather, and request airport advisory or airport information service. A departing aircraft should initiate contact before taxiing, reporting aircraft identification and type, VFR or IFR, location on the airport, intentions, direction of take-off, possession of the automated weather, and request airport advisory or information service. Also, report intentions before taxiing onto the active runway for departure. If you must change frequencies for other service after initial report to FSS, return to FSS frequency for traffic update.

(a) Inbound

EXAMPLE--
Vero Beach radio, Centurion Six Niner Delta Delta is ten miles south, two thousand, landing Vero Beach, I have the automated weather, request airport advisory.

(b) Outbound

EXAMPLE--
Vero Beach radio, Centurion Six Niner Delta Delta, ready to taxi to runway 22, VFR, departing to the southwest, I have the automated weather, request airport advisory.

3. Airport advisory service includes wind direction and velocity, favored or designated runway, altimeter setting, known airborne and ground traffic, NOTAMS, airport taxi routes, airport traffic pattern information, and instrument approach procedures. These elements are varied so as to best serve the current traffic situation. Some airport managers have specified that under certain wind or other conditions designated runways be used. Pilots should advise the FSS of the runway they intend to use.

CAUTION--
All aircraft in the vicinity of an airport may not be in communication with the FSS.

e. Information Provided by Aeronautical Advisory Stations (UNICOM)

1. UNICOM is a nongovernment air/ground radio communication station which may provide airport information at public use airports where there is no tower or FSS.

2. On pilot request, UNICOM stations may provide pilots with weather information, wind direction, the recommended runway, or other necessary information. If the UNICOM frequency is designated as the CTAF, it will be identified in appropriate aeronautical publications.

f. Unavailability of Information from FSS or UNICOM

Should LAAS by an FSS or Aeronautical Advisory Station UNICOM be unavailable, wind and weather information may be obtainable from nearby controlled airports via Automatic Terminal Information Service (ATIS) or Automated Weather Observing System (AWOS) frequency.

g. Self-Announce Position and/or Intentions

1. General. Self-announce is a procedure whereby pilots broadcast their position or intended flight activity or ground operation on the designated CTAF. This procedure is used primarily at airports which do not have an FSS on the airport. The self-announce procedure should also be used if a pilot is unable to communicate with the FSS on the designated CTAF. Pilots stating, “Traffic in the area, please advise” is not a recognized Self-Announce Position and/or Intention phrase and should not be used under any condition.

2. If an airport has a tower and it is temporarily closed, or operated on a part-time basis there is no FSS on the airport or the FSS is closed, use the CTAF to self-announce your position or intentions.

3. Where there is no tower, FSS, or UNICOM station on the airport, use MULTICOM frequency 122.9 for self-announce procedures. Such airports will be identified in appropriate aeronautical information publications.

4. Practice Approaches. Pilots conducting practice instrument approaches should be particularly alert for other aircraft that may be departing in the
Appendix H  MESA Lab Mission Planning

Proposed Flight Date: ___________  Aircraft: ___________
Prepared by: ________________  Mission: ___________

1. Define Mission Objectives and Area of Operation (Attach GIS)
   Mission Objectives: __________________________________________
                        __________________________________________
                        __________________________________________

2. Define Suitable Take Off and Landing Locations (Terminal Areas) within the range of the Area of Operation
   Terminal Areas: __________________________________________
                    __________________________________________
                    __________________________________________

3. Define the Flight Path, checking for suitable altitude, avoiding populated areas and restricted airspace
   Flight Path: __________________________________________
                __________________________________________
                __________________________________________
                __________________________________________
                __________________________________________
                __________________________________________

| Restricted Airspace: | Populated Area: |
4. Define Contingency Locations: Emergency Landings and Standby Locations

Emergency Areas: _______________________________________________________
___________________________________________________________
___________________________________________________________

Standby Areas: ______________________________________________________
___________________________________________________________
___________________________________________________________

5. Define and Evaluate Flight Phase Transitions, adjust if necessary

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<th>Phase Transitions</th>
<th>Altitude</th>
<th>Adjustment</th>
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6. Simulate Flight Mission; re-plan if Mission Objectives are not met

☐ Mission Objectives Met
If not, describe: __________________________________________
________________________________________
________________________________________

☐ Simulated Flight Time: __________