Standard Operating Procedures
Unmanned Aerial Vehicles (UAVs)
Contents
Terminology .................................................................................................................. 3
UAV Team ...................................................................................................................... 3
  Applicability ................................................................................................................ 4
  Relation to ReOC Operational Manual .................................................................... 4
  Responsibilities of Chief Remote Pilot .................................................................... 4
  Responsibilities of a Maintenance Controller ......................................................... 4
  Responsibilities of Remote Pilot in Command .......................................................... 5
  Responsibilities of Camera Operator, Spotter & Others ......................................... 5
UAV Job/Mission Planning .......................................................................................... 6
  Create a Job or Mission ............................................................................................ 6
  Job Area Creation ...................................................................................................... 7
  Check the Airspace Calculator ................................................................................. 8
  Risk Assessment ........................................................................................................ 9
Pre-Flight Checklist .................................................................................................... 9
  UAV Serviceability Prior to Operation AVCRM .................................................... 9
Pre-Operational Briefing ............................................................................................ 10
  Pre-Flight Checklist .................................................................................................. 10
  Pre-Start Checklist .................................................................................................... 11
Diagram of the UAV Operations Area ........................................................................ 11
  Primary and Backup Landing Zones ....................................................................... 11
  Beach Staging ............................................................................................................ 12
  Proximity Restrictions .............................................................................................. 12
  Take-off and Landing ............................................................................................... 12
Post Flight Checklist ................................................................................................... 13
UAV Cleaning .............................................................................................................. 13
Safe UAV Operations .................................................................................................. 14
  UAV Airframe Damage ............................................................................................ 14
  Collision, Crash and Damaged Aircraft .................................................................. 14
  Lack of Airspace Separation ................................................................................... 14
Maintenance .................................................................................................................. 14
  Aircraft Maintenance ............................................................................................... 14
  Battery Management ............................................................................................... 15
    Battery Care and Charger Use .............................................................................. 15
    Battery Storage ...................................................................................................... 15
    Battery Replacement ............................................................................................. 15
Terminology
UAV (Unmanned Aerial Vehicle), commonly referred to as a drone or RPAS.
Please see below some common names for UAV and associated terminology.

<table>
<thead>
<tr>
<th>UAV</th>
<th>Unmanned Aerial Vehicle</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPAS</td>
<td>Remotely Piloted Aircraft Systems</td>
</tr>
<tr>
<td>UAS</td>
<td>Unmanned Aircraft System</td>
</tr>
<tr>
<td>SUAS</td>
<td>Small Unmanned Aircraft System</td>
</tr>
<tr>
<td>VLOS</td>
<td>Visual Line of Sight</td>
</tr>
<tr>
<td>EVLOS</td>
<td>Extended Visual Line of Sight (Requires CASA and CRP Approval)</td>
</tr>
<tr>
<td>BVLOS</td>
<td>Beyond Visual Line of Sight (Requires CASA and CRP Approval)</td>
</tr>
<tr>
<td>CRP</td>
<td>Chief Remote Pilot</td>
</tr>
<tr>
<td>RP</td>
<td>Remote Pilot</td>
</tr>
</tbody>
</table>

UAV Team

<table>
<thead>
<tr>
<th>SLS UAV Team</th>
<th>All UAV Team Members</th>
<th>(02) 9471 8000</th>
<th><a href="mailto:drones@surflifesaving.com.au">drones@surflifesaving.com.au</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Paul Hardy</td>
<td>UAV Operations Coordinator</td>
<td>0438 664 622</td>
<td><a href="mailto:phardy@surflifesaving.com.au">phardy@surflifesaving.com.au</a></td>
</tr>
<tr>
<td></td>
<td>Roles:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Chief Remote Pilot</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Maintenance Controller</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angus MacPhail</td>
<td>DPI UAV Officer</td>
<td>0417 429 377</td>
<td><a href="mailto:amacphail@surflifesaving.com.au">amacphail@surflifesaving.com.au</a></td>
</tr>
<tr>
<td>Emily Bidencope</td>
<td>Membership UAV Officer</td>
<td>02 9471 8011</td>
<td><a href="mailto:ebidencope@surflifesaving.com.au">ebidencope@surflifesaving.com.au</a></td>
</tr>
</tbody>
</table>
Applicability
These Standard Operating Procedures provide instructions for the operation and management of Unmanned Aerial Vehicles (UAVs) and all persons involved in the operation of UAVs that are operating under Surf Life Saving New South Wales as Sub 2kg Excluded Commercial Operators.

Relation to ReOC Operational Manual
Specific workflows relating to procedures such as shark spotting and integration of UAVs into Surf Life Saving are provided in order to clarify these operations. These SOPs are aligned to the Standard Operating Conditions outlined in Civil Aviation Safety Regulations, Part 101, however, for ReOC Operations, the ReOC Operations Manual takes precedence in all circumstances.

Responsibilities of Chief Remote Pilot
The Chief Remote Pilot is responsible for all operational matters and Remote Pilot (RP) training affecting the safety of operations.

The role and responsibilities of the Chief Remote Pilot are:

- Ensure that operations are conducted in compliance with the Civil Aviation Act and the Regulations;
- Maintain a record of qualifications held by each Remote Pilot (RP);
- Monitor and maintain operational standards, supervise and train RP(s) who work under both the authority of the Remote Operators Certificate (ReOC);
- Maintain a complete and up-to-date reference library of operational documents as required by Civil Aviation Safety Authority (CASA) for the class of operations conducted;
- Develop applications for approvals and permissions where required to facilitate company operations;
- Develop checklists and procedures relating to flight operations;
- Be the point of contact with CASA;
- Notify CASA prior of any change to this manual or its schedule.

Responsibilities of a Maintenance Controller
The Maintenance Controller is responsible for ensuring the maintenance of Remotely Piloted Aircraft Systems (RPAS) in accordance with the manufacturer specifications.

The role and responsibilities of the Maintenance Controller are:

- Control all company UAV maintenance, either scheduled or unscheduled;
- Keep records of personnel permitted to perform maintenance on UAV including details of their training and qualifications;
- Develop, enforce and monitor UAV maintenance standards;
- Maintain a record of UAV defects and any unserviceability;
- Ensure that specialist equipment items including payload equipment are serviceable;
- Maintain a thorough technical knowledge of UAV operating under the authority of the ReOC;
- Ensure maintenance activities are conducted in accordance with the procedures detailed in the relevant UAV section of the UAV Operational Library;
- Investigate all significant defects in the UAV.
Responsibilities of Remote Pilot in Command

For the purposes of this SOP a ‘Remote Pilot’ includes a holder of a ‘Remote Pilot Licence’ or has attended the SLSNSW UAV training course.

The Remote Pilot in Command of the aircraft is responsible for:

- Creation pre and post flight logs via AVCRM
- Conduct of flight in accordance with company procedures;
- Safe operation of the aircraft;
- Acting in accordance with company procedures;
- Follow the rules of the air as defined by CASA’s legislation.
- Ensure through cleaning post flight is completed and batteries with 30% charge or less are placed on charge. Batteries are to be inspected prior to charging as per Battery Management Procedure.

Responsibilities of Camera Operator, Spotter & Others

All camera operators, spotters and other persons involved in the operation of UAV controlled under the authority of the ReOC or Sub-2Kg SOP are required to comply with the procedures and direction set out in the UAV SOP.
UAV Job/Mission Planning

All UAV Operations are required to be logged prior to any flight operations via the AVCRM online portal. Please see detail in this SOP on how to create an operation.

The AVCRM portal allows greater visibility for the UAV team to manage UAV operations and assist you with UAV operations. The AVCRM system manages all UAV mission or Job planning, area approvals, UAV Pilot qualifications and competencies, maintenance, UAV time in service.

Create a Job or Mission

Select the Job Manager Tab on the left-hand side of the screen and select create job. Give your Job a name for example Avoca Beach Nippers Carnival.

Complete the questions making sure all details are accurate including the pilot, as the AVCRM and AIRDATA will be logged against the nominated UAV Pilot.
Job Area Creation

Highlight the area in which you wish to operate, include areas of UAV exclusion, the planned flight area, Take-off and Landing Area with alternative landing site and highlight where you are planning on placing your signage.
Check the Airspace Calculator

The Airspace Calculator will display your proposed job airspace on the left-hand side of the screen. The Airspace Calculator shows you the airspace you are operating in and around. Depending on your license type (Remote Pilot License or operating under CASA’s Sub 2kg Exclusion), you can click on the coloured areas of airspace, restricted/danger areas and other feature classes (National Parks, Fire and Emergency and other temporary restricted areas) and understand how you must operate.

By clicking on the Filter (top right of the calculator) you can expand your search radius, and turn feature sets on and off.

By clicking the ‘Add+’ button on frequencies you can add the radio frequencies to your job. You can also find out necessary information of bearings and distances from these places.
Standard Operating Procedures Unmanned Aerial Vehicles (UAVs)

Risk Assessment

A risk assessment should be completed prior to any UAV operation. Your risk Matrix will be pre-populated with common risks seen at the beach and how you can mitigate the risk.

<table>
<thead>
<tr>
<th>Steps</th>
<th>Title</th>
<th>The Risk</th>
<th>The Consequence</th>
<th>Existing Controls</th>
<th>Risk Rating</th>
<th>Additional Controls</th>
<th>Final Risk Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>Pedestrian Traffic</td>
<td>Pedestrian Traffic</td>
<td>Being able to maintain 30m from pedestrian traffic during take off and landing</td>
<td>Utilize signage and a cordoned off 30m operations area</td>
<td>2 2 4</td>
<td>Add a spotter to stop pedestrian traffic during UAV take off and landing</td>
<td>2 1 3</td>
</tr>
<tr>
<td>002</td>
<td>Bird Hazard</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Options »</td>
</tr>
<tr>
<td>003</td>
<td>Boats and Marine Craft</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Options »</td>
</tr>
<tr>
<td>004</td>
<td>Maintaining 3G Vessels</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Options »</td>
</tr>
<tr>
<td>005</td>
<td>UAV Battery Failure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Options »</td>
</tr>
</tbody>
</table>

Pre-Flight Checklist

UAV Serviceability Prior to Operation AVCRM

Pre-flight and post flight checks are mandated for all operations. The Remote Pilot must record the completion of these checks during the running stage of the job. Once these checklists are completed and the job is completed then the AVCRM application will automatically fill out the Electronic UAV Time in Service log.

All defects found in the UAV must be recorded during the finish job stage in the AVCRM application. Once the job is completed the application will automatically enter the defect on that machines Electronic Defect/ Maintenance Log.

The Remote Pilot must ensure that all defects or outstanding maintenance actions detailed in the Defect/Maintenance Log have been addressed prior to operation of the UAV.
Pre-Operational Briefing

The following briefing is to be given by the Remote Pilot to all persons involved in the UAV operation. The Remote Pilot is also responsible to ensure the emergency contact telephone numbers are to hand.

The briefing will include an overview of the mission, all persons involved, their responsibilities and call signs, as well as identified risks and control measures.

Pre-Flight Checklist

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screen</td>
<td>Crystal Sky battery charged and operational</td>
</tr>
<tr>
<td></td>
<td>Logged into DJI GO via the APP and AVCRM through the internet browser</td>
</tr>
<tr>
<td>Controller Batteries</td>
<td>Charged sufficient for flight</td>
</tr>
<tr>
<td>Aircraft LiPo batteries</td>
<td>Charged and condition checked</td>
</tr>
<tr>
<td>Propellers</td>
<td>Checked for:</td>
</tr>
<tr>
<td></td>
<td>- Condition</td>
</tr>
<tr>
<td></td>
<td>- Tightness</td>
</tr>
<tr>
<td></td>
<td>- Dents leading edges</td>
</tr>
<tr>
<td></td>
<td>- Cracks or signs of stress</td>
</tr>
<tr>
<td></td>
<td>- Correct Orientation</td>
</tr>
<tr>
<td></td>
<td>- Motors Check for free movement</td>
</tr>
<tr>
<td></td>
<td>- No abnormal movement or noises</td>
</tr>
<tr>
<td>Frame</td>
<td>- Visual check screws located</td>
</tr>
<tr>
<td></td>
<td>- Check for cracks or damage</td>
</tr>
<tr>
<td></td>
<td>- Check for security by firmly flexing</td>
</tr>
<tr>
<td>Battery</td>
<td>- Battery condition checked</td>
</tr>
<tr>
<td></td>
<td>- Check for swelling</td>
</tr>
<tr>
<td></td>
<td>- Check for leakage</td>
</tr>
<tr>
<td></td>
<td>- Inserted Correctly</td>
</tr>
<tr>
<td>Lights</td>
<td>- Check for function</td>
</tr>
<tr>
<td></td>
<td>- Check for damage</td>
</tr>
<tr>
<td>Transmitter</td>
<td>- Check levers and switches for security and function</td>
</tr>
<tr>
<td></td>
<td>- Aerial check located</td>
</tr>
<tr>
<td></td>
<td>- Aerial check for damage</td>
</tr>
<tr>
<td></td>
<td>- Battery compartment checked for security and correct orientation of batteries</td>
</tr>
<tr>
<td>Gimbal</td>
<td>- Check for correct function</td>
</tr>
<tr>
<td></td>
<td>- Check for damage</td>
</tr>
</tbody>
</table>
Pre-Start Checklist

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camera</td>
<td>Check camera ON</td>
</tr>
<tr>
<td>Controller</td>
<td>Switch ON</td>
</tr>
<tr>
<td></td>
<td>Check battery voltage sufficient</td>
</tr>
<tr>
<td></td>
<td>Correct Model Selected</td>
</tr>
<tr>
<td></td>
<td>Switch positions set</td>
</tr>
<tr>
<td></td>
<td>Throttle closed</td>
</tr>
<tr>
<td>UAV</td>
<td>Location checked, ensure clear of populous areas</td>
</tr>
<tr>
<td>UAV Start</td>
<td>Insert Battery</td>
</tr>
<tr>
<td></td>
<td>Switch ON</td>
</tr>
<tr>
<td></td>
<td>Check ESC introduction (beeping)</td>
</tr>
<tr>
<td></td>
<td>Power UAV (use caution, remain clear of blades)</td>
</tr>
<tr>
<td>Monitor Start</td>
<td>Check indication of satellite lock</td>
</tr>
<tr>
<td>Downlink</td>
<td>Power video receiver and video monitor on confirm picture</td>
</tr>
<tr>
<td>Lift Off</td>
<td>Check controls and perform orientation familiarisation</td>
</tr>
<tr>
<td></td>
<td>Fly mission</td>
</tr>
</tbody>
</table>

Diagram of the UAV Operations Area

Primary and Backup Landing Zones

Every operation needs to identify a staging point for take offs and landings as well as a backup landing zone. All staging areas must be 30 metres either side of the UAV and be identified by barriers, flags or bunting, signs to warn and restrict access to the general public.

Where possible, both primary and back up landing zones should be downwind of the club house, patrol tent or SLS command post. They should always be clear of trees, overhead wires and buildings and must provide enough clearance to allow the craft to reach 5 metres high before an upwards angled flight out to the transect line.
Beach Staging

Occasionally, a staging area will be required on the beach. Below is a diagram identifying the layout of the beach:

Diagram identifying the layout of the necessary safety precautions and cordoned area required by UAV’s when operating off a beach.

The staging area is to be 30 metre x 30 metre and separated from public areas by traffic cones, signage and safety/warning tape. The staging area will ideally be located behind the IRB area as this provides a cleared corridor to the water’s edge for take-offs and approaches to the beach.

Proximity Restrictions

There are several proximity restrictions that are mandatory for all UAVs operated by SLSNSW. They include a flight ceiling of 120 metres (400ft) above ground level (AGL); being at least 30 metres from any person not involved with UAV operations; at least 5.5km away from aerodromes with an operating control tower and 3 nautical mile radius of an uncontrolled aerodrome or helicopter landing site.

All SLSNSW UAV will be electronically limited to a maximum horizontal distance of 400 Metres and a maximum altitude of 120 Metres (400ft).

Take-off and Landing

The UAV should take off and hover approximately 5 metres above ground level where controls and systems checks can be made prior to flight. After the checks have been made the UAV can fly towards the water keeping within the operational area and gradually increasing altitude. At no time should the UAV be flown over the beach and or people, this includes swimmers and persons using watercraft.

When returning to land the UAV should fly in within the marked operational area entering the area at a height of 5 metres slowly decreasing altitude until landed.
Post Flight Checklist

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aircraft LiPo Batteries</td>
<td>Removed for charging</td>
</tr>
<tr>
<td>Propellers</td>
<td>Checked for damage</td>
</tr>
<tr>
<td>Motors</td>
<td>Check for free movement and for temperature changes in the motors. Temperature change may indicate a motor working harder than the others.</td>
</tr>
<tr>
<td>Frame</td>
<td>Check for damage</td>
</tr>
<tr>
<td></td>
<td>Check for foreign objects</td>
</tr>
<tr>
<td>Undercarriage</td>
<td>Check for damage</td>
</tr>
<tr>
<td>Gimbal</td>
<td>Check for damage</td>
</tr>
<tr>
<td></td>
<td>Check for foreign objects</td>
</tr>
<tr>
<td>Aircraft</td>
<td>Placed back into case</td>
</tr>
<tr>
<td>Sync</td>
<td>Sync DJI GO App</td>
</tr>
</tbody>
</table>

UAV Cleaning

SLSNSW has provided a cleaning kit which has all the necessary equipment to clean and maintain the UAV. Cleaning should be completed at the end of every shift, making sure to remove salt spray, sand and any other debris.

Please contact your local Branch UAV Coordinator to arrange restocking of cleaning kit equipment.
Safe UAV Operations

UAV Airframe Damage

In the event of airframe damage, the Remote Pilot should make all attempts necessary to safely control and navigate the UAV to the landing zone, and if possible, land safely. If it is unable to land safely, the Remote Pilot should control the situation and make sure that the UAV does not cause damage to people or property in the surrounding area.

Collision, Crash and Damaged Aircraft

Where a collision or crash occurs, priority shall be given to reduce any further damage or injuries to persons or property. Attempts shall be made to shut down motors via the transmitter as soon as possible, battery power shall be disconnected, and the scene preserved. Public shall be restricted access to area until deemed safe.

The UAV shall be immediately inspected for potential of a damaged battery to monitor the potential of a battery fire. The UAV will be deemed unserviceable pending inspection by the Maintenance Controller. The Remote Pilot shall notify the rostered patrol, if on-duty, and the State Operations Centre via radio.

Lack of Airspace Separation

In the event that “lack of airspace separation” occurs i.e. where there is a risk of the unmanned aircraft intersecting with the flight path of a manned aircraft or other UAV, the following actions should be taken:

- Situation assessed by Remote Pilot in command;
- Altitude dropped appropriately;
- Further evasive manoeuvres conducted if necessary;
- Hold position or initiate Return to Home (RTH);
- Aircraft landed, situation re-assessed.

In this scenario it is paramount that the UAV Pilot and flight crew act diligently to increase the distance between the two aircraft. A manned aircraft has right of way over an UAV under all circumstances.

SLSNSW UAV operations may encounter other recreational UAV’s within the operational area, use the same actions as the “Lack of Separation Scenario” to decrease the risk of collision.

Maintenance

Aircraft Maintenance

All equipment maintenance should be carried out in an orderly process and use of checklists (provided) is encouraged, ensuring that no checks are missed. A number of these checks have been detailed already and so are linked below:

1. Pre-Operational Checks
2. Post-Operational Checks
3. Defect Logging
Battery Management

Battery Care and Charger Use

- Only use the supplied Lithium Polymer (LiPo) chargers. Using the incorrect charger or charge rate may cause damage to batteries and is potentially a fire hazard;
- Batteries should always be balanced charged according to their associated specifications;
- Never charge batteries unattended;
- Never charge hot or warm batteries, wait until they are less than 30°C;
- If a battery is noticed to be swollen either during charging or flight operations, it should be disconnected immediately and placed in a safe location for observation. Swollen batteries should be replaced immediately;
- If wires are accidently shorted or connected incorrectly, the battery should be disconnected immediately and placed in a safe location for observation for 15 minutes;
- Never charge in enclosed or hot conditions;
- Only charge batteries that have 30% or less charge.

Battery Storage

- Store batteries at room temperature between 15°C and 27°C;
- Do not expose batteries to direct sunlight for extended periods of time;
- Charge in an open area on a non-flammable surface such as concrete floor
- It is possible to transport or temporarily store batteries in warm temperatures, such as that of a vehicle, however this should be limited to no more than 2 hours at a time.

Battery Replacement

- Battery usage should cease when a pack loses 20% of its rated capacity;
- Internal resistance of cell breaches 6 milliohm, you can check the battery levels in DJI Go prior to flight;
- The process for swollen or damaged batteries follows:
  o Removed from use;
  o Reported within AVCRM;
  o Arrange with Maintenance Controller or local supervisor for further instructions;
  o Batteries for disposal should be discharged using the "discharge function" on the DJI charging hub. Once completed, batteries should be wrapped in a suitable LiPo bag and disposed according to local battery disposal requirements.

Battery Register/Log

All battery cycles must be logged in the AVCRM software. Any defects to be recorded in the defect log as per the process [here](#).

Operational Techniques

All specific operations detailed below are subject to the full restrictions detailed in previous sections of these Standard Operating Procedures - the purpose of this section is to detail specific techniques relating to types of operations.
Marine Wildlife Surveillance

- Height: 60m
- Camera angle: 90 degrees
- Speed: 8m/s (29-30km/h)
- Flight path: Inside edge of viewable area to line up with the backline of the surf break.
- Camera settings: 4K, 25fps, MP4, PAL, auto WB, no style, normal colour, video captions enabled, EV exposure +0.0
- Incident notification (Tiger, White and Bull sharks are to be reported to SLSNSW State Operations Centre via radio): flight location, size in metres, species, location of shark, heading, water users.

Example:
- “Lennox Head UAV report 3 metre white shark 300 metres north of Lennox Head SLSC, tracking north. No water users nearby, no threat.”
- “Lighthouse UAV report 3.5 metre unknown shark at Ballina North Wall, tracking north. Water users evacuated, authorities notified.”

UAV Hardware Overview

DJI Phantom 4

Aircraft and Remote Controller
https://www.dji.com/au/phantom-4-pro/info

Intelligent Flight Battery

DJI Mavic 2 Enterprise

Aircraft and Remote Controller
https://www.dji.com/au/mavic-2-enterprise

Intelligent Flight Battery

CrystalSky

Screen
https://www.dji.com/au/crystalsky/info#specs

Battery
AVCRM’s RPA Manager

Job Workflow

For

Surf Life Saving NSW
Table of Contents

Table of Contents........................................................................................................................................... 2
General.................................................................................................................................................................. 3
  Applicability                                                                .................................... 3
  Revision Log................................................................................................................. 3
  Compliance Requirement ............................................................................. 3
  Abbreviations, Acronyms and Definitions ....................................................... 3
Logging in to (and Navigating) the Application............................................. 4
  The Dashboard............................................................................................................. 5
Planning a Mission (or Job) .................................................................................... 6
  Design your Job Area .......................................................................................... 8
  Checking your Airspace ..................................................................................... 9
  Attaching Risk Assessments ........................................................................... 11
  Completing the JSA (Job Safety Assessment) .................................................. 13
  Compliance Signature......................................................................................... 14
Starting your Job.......................................................................................................... 15
  Pre-Flight Procedure ......................................................................................... 15
Post Flight ......................................................................................................................... 18
  Recording a Wildlife Observation .................................................................. 19
  Entering Information for a Flight ................................................................. 22
Finish the Job ......................................................................................................................... 24
  Details ..................................................................................................................... 24
  Post Flight Checklist .......................................................................................... 25
  Defect Management ............................................................................................. 26

© AVCRM Products 20/09/2019
General

Applicability

This document encompasses the process that must be follow by all members of Surf Life Saving Australia, paid or volunteer.

Every flight must be planned and input before each flight and finished correctly after each flight. This is not mandatory, and will be audited by management.

Failure to comply will be recorded and acted upon.

Revision Log

<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
<th>Affected Parts</th>
<th>Affected sections</th>
<th>Summary of revision</th>
<th>Authorised by</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 Sep 2019</td>
<td>v1.0</td>
<td>All</td>
<td>All</td>
<td>Initial document production</td>
<td>Isaac Palmer</td>
</tr>
</tbody>
</table>

Compliance Requirement

The instructions, procedures and information contained in this manual have been devised to ensure the legality, safety and standardisation in the conduct of operations. They are to be observed by all operating personnel. Personnel are reminded of their obligation to comply with the Civil Aviation Act, Regulations and Orders and such directives, aeronautical information and notices as issued in CASA and Airservices Australia publications. Nothing in this manual takes precedence over CASA regulations or permits unsafe operation.

Abbreviations, Acronyms and Definitions

JSA  Job Safety Assessment  
LHOM  Left Hand Operational Menu  
NOTAM  Notice to Airmen  
RHSM  Right Hand Setup Menu  
RPA  Remotely Piloted Aircraft (or Drone)
Logging in to (and Navigating) the Application

On your Crystal Sky (the device that is used to control the RPA, click on the Internet Browsing application, and navigate to:

$sls.rpa.avcrm.net$

User your given details to log in (your email and password). There is a ‘Forgot Password?’ button to click if you have forgotten.

Note: You will NOT be able to log in via avcrm.net, this is purely a billing portal for account administrators.

Note: ‘Sign in with Google’ or ‘Log in with Facebook’ will NOT work.
The Dashboard

The Dashboard is a quick overview tool, which allows access to the operational side as well as any setup that might be needed.

The left hand operational menu (LHOM) is shown under the SLS logo, which allows for anything ‘Operational’ to be done within the application. This includes starting jobs, checking documents and updating qualifications.

Through the three cogs on the right-hand side (next to your name), the set-up menu can be brought up (RHSM). This allows you to control your passwords, but also to navigate to any video tutorials necessary through the inbuilt library.

The top menu also has the two hot keys that will be mentioned throughout this document

- Blue button with an aircraft – Flight Tracker
- Green button with binoculars – Wildlife Observations

To start the job process, click in the LHOM to ‘Job Manager’.
Planning a Mission (or Job)

Through the LHOM, click on the Job Manager, and then go to Create Job. The red tabs across the top (note that your colour scheme may differ from base to base) allow you to navigate through different stages of the job.

Each section details what sort of information to fill out in each area.

NOTE: All of the information supplied in this document is EXAMPLE ONLY, and should not be copied. Click in each field to change the information, using the drop-down menu’s as necessary. The finished page should look similar to this *including the Client and Flight Schedule fields, your RPA will be different (you will only see the RPA that you are authorised to fly.)
Fill out the next section, selecting the Support Crew (either from the drop down list from your base, or free typing someone else who is assisting you with the flight for the day).

SMS (Safety Management System) Strategic Themes are the risk categories that categorise your flight. For 905 of your operations, you will select the ones shown in the below screen shot. (Note that VLOS stands for Visual Line of Sight).

Emergency contacts will pre fill, but you can add extras where necessary.

Click Next when ready.
Design your Job Area

Using the map, you can layout the area for all of your operations for the day.

The yellow circle with the cross in it refers to where your area standing whilst you are operating the RPA. Create all of your exclusion areas, operational areas and safe areas, as per your regulations.

Simply click on ‘Create’ to the right of the map, and select the template shape you need. Click the map, and you can box out your areas using the pre-defined shapes (Circle or Box) or create your own (Polygon) – to finish the polygon, simply click back on the first point you made.

Once created, you can click on the shapes to edit them.
Checking your Airspace

The Airspace Calculator shows you the information you need to operate in your specific area (the blue pin signifies you). Each of the airspace shown in the map below can be clicked on, and the information can be collated from the right of the map (along with the information of their location in relation to you).

If available, click the ‘Frequencies’ section to select the VHF radio channels you wish to monitor (you cannot transmit unless you have an AROC).

Other important information will populate on this map where applicable (NSW National Parks or Conservation areas and Bushfire Zones), showing absolute NO FLY zones.
Click on the green ‘Get Current NOTAMs’ button to populate through any NOTAMS (Notice to Airmen) for your area. This is a communication stream for pilots and aerodromes to display notices.

You can then add the type of airspace you are operating in (usually Class G), and any other frequencies you wish to monitor.

Click Next when ready.
Attaching Risk Assessments

For this section, simply select ‘Select Existing’ under the Risk tab, which allows you to add your standard risk assessment as developed by management. Select the version and click ‘Confirm’.

Eventually, these will be able to be modified by individual pilots.
You can then View the Risk Assessment to make sure it covers everything you believe it needs for this job. If not, please contact your supervisor.

Click Next when ready.
Completing the JSA (Job Safety Assessment)

A JSA must be completed each day, with every item being checked off and recorded before flights can be conducted.

Select Yes on your Maps and Charts (as you have checked these in your Job Area tab). Feel free to double check your Airspace if you are unsure.

Click each item as ‘Checked – Serviceable’ or ‘Checked – Unserviceable’ as required. Not if you check ‘Checked – Unserviceable’, you will be required to input text on why you selected that.

For each item, you can add Text, Photos or a Geotag where necessary. All of these features help to increase situational awareness as well as confidence in the operation.

Click Next when ready.
Attachments

Add any additional attachments (weather/surf reports, rosters, etc.) that you deem necessary.

Click Next to Continue

Compliance Signature

Draw your signature in the box (using a stylus or your finger) and click Save Changes.

Your job is now fully planned, and you will be returned to the dashboard.
Starting your Job

Pre-Flight Procedure

From the dashboard, select the blue button as mentioned earlier, to start the job.

Locate your job in the drop down (there will rarely be multiples in here) and click the green ‘Start Job’ button.
This will bring up a detailed summary of all of the information you entered when creating the job. Go through each page and check the information is correct and up to date.

Note: You can change the job areas here if you deem necessary (i.e. conditions have changed).

Complete the Pre-Flight Checklist as instructed (just like the JSA), noting that this will be different for each type of RPA. Each item will include a description of what to check.

Click Save Changes when done.
Your job is now running. There is nothing left to do on AVCRM – switch over to DJI Go and fly the RPA!

<table>
<thead>
<tr>
<th>JOB #</th>
<th>STATUS</th>
<th>JOB NAME</th>
<th>RPA IDENTIFIERS</th>
<th>PILOTS</th>
<th>JOB DATE</th>
<th>LOCATION</th>
<th>CLIENT</th>
<th>OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000190</td>
<td>Running</td>
<td>Saturday Patrol Flights</td>
<td>AV-PH3-002</td>
<td>Isaac Palmer</td>
<td>20/09/2019</td>
<td>South Kingscliff</td>
<td>Surf Lifesaving</td>
<td>Options</td>
</tr>
</tbody>
</table>

The rest of this page is intentionally blank.
Post Flight

Flight details and information must be entered into AVCRM after each and every flight. 

**There is no exception to this rule.**

Once you have landed and turned the RPA and deemed it safe. Open up the AVCRM browser again, and navigate to the flight tracker. Check that the job you have started is now Running, and the list of scheduled flights for the day has populated.

If you spotted any sharks on this flight, close this popup and follow the next step. If there were no sharks spotted on this particular flight. Skip the next step and go to ‘Entering Information for a Flight’.
Recording a Wildlife Observation

Click on the binoculars from the dashboard (as shown below).

This will bring up the Observation Modal window, where you can click on the map as to the general location where the shark was sighted.
Once an area is clicked, the screen will auto drop down the select the species (note your pictures and order will change from time to time).

Input the information on the number of sharks recorded (mandatory), and the ‘Activity’ and ‘Attraction Activity’ if applicable (these two are not mandatory).

Click on the ‘Countermeasure/s’ that was used for this observation. If a time box drops down, in the example above, the first one shows when you started to use the drone siren, and the second time is when it was completed/stopped.

Add any additional notes as required.
Click the box to say that video was or wasn’t captured (remember that it is standard that video **must** be captured (note the grey text that explains how to name these files).

Click ‘Get Current METAR’ to include the nearest station’s weather data where necessary.

From here, you can attach this observation to a particular flight for a job (as shown below). Once ready, click the red ‘+Add observation’ button to complete this (one) observation. If multiple were recorded during the one flight, you can repeat this process.

Once all observations are added, they will sit under the ‘Pending Observations’ heading, where they can be submitted to the system.
Entering Information for a Flight

Once wildlife observations have been recorded (if any) you can then close off the individual flight that you have just completed.

Click on the arrow on the far right on the ‘Flight No’ bar, to drop down the flight information input page.

Note: This will eventually be upgraded to allow you to click anywhere on the bar.
Enter details are required (conditions, and timings), and select the batteries that you flew with.

If the aircraft did NOT fly, simply click that button and a box will appear asking you why you did not fly, and telling you to contact surf com to explain.

Note: There will eventually be a button here to click ‘Apply to All’, allowing you to quickly and easily cancel the remainder of the days flights if necessary (i.e. rained out).

If you have forgotten to link your wildlife observations, you can click in the white bar to add any from the list.

Once completed, simply press ‘Sync Flights’. The information recording for this flight has now been completed.

Repeat these steps for each flight of the day.
Finish the Job

Details

Once you have completed your last flight for the day, you can click (through the Flight Tracker) ‘Finish Job’.

Change the ‘Job Finish Time’ if necessary, and input the Duty Time into the system. Duty Time is the complete shift time that you have been operating the drone.
Post Flight Checklist

Navigating through the pages, there is a section that allows you to revise any flight information (and correct where necessary), and then complete a Post Flight Checklist.

This ensures the RPA is returned in working order, ready for the next Pilot to operate. Simply fill out as you have done for both the JSA and Pre-Flight.

Click Next when ready.
Defect Management

If the craft suffers a defect (i.e. a crash or an incident), it **must** be recorded within AVCRM, as well as being reported to your supervisor.

**No matter the severity.**

Simply press the ‘Add Defect +’ button, and put in a description that covers what happened during that flight/landing/ etc.

When finished, press ‘Save Changes’ and your job is complete!