Southern Cross University

Remotely Piloted Aircraft Operations Library

Version 2.1

April 2025

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General

Applicability

The RPAS Operational Library is available to all people conducting activities under the authority of the Unmanned Aerial Vehicle Operators Certificate (UOC). The Chief Remote Pilot is responsible for maintaining the library.

The RPAS Operational Library contains:

- a section that contains general and specific operational procedures
- a section for each RPAS type operated under the authority of the UOC

The specific section for each RPAS will include the following information:

- maintenance information such as pre/post flight checks, maintenance schedules, maintenance manuals for UAV/ground station/camera, etc.
- RPAS operational information such as RPAS user manuals for UAV/ground station/camera, etc.

Information included in the RPAS Operational Library may be a hard copy or electronic document, or included by reference to an external source.

The Chief Remote Pilot will ensure that all information required to safely conduct an operation is available to all persons working under the authority of the UOC. Where online information is used, the Chief Remote Pilot will consider the availability of online connections prior to the authorisation of the operation.

0.1 Distribution Control

The Chief Remote Pilot shall annually review the contents of the RPAS Operational Library to ensure the relevance and currency of all procedures. A record of the review shall be made in the revision log of the Chief Remote Pilot's copy of the manual indicating that the review has been completed and indicating whether any amendments were required as a result of the review.

0.2 Amendment Procedure

The RPAS Operational Library is a living document that contains procedures and information relevant to the safe operation of RPAS. The procedures and information detailed in the library will be approved and controlled by the Chief Remote Pilot. Persons working under the authority of this UOC will be advised of any changes to the library or the inclusion of any new procedure or information.

Where in the light of operating experience, errors are found in procedures or information associated with this library, these deficiencies will be reported to the Chief Remote Pilot.

Unless otherwise directed by CASA, all changes to this RPAS Operational Library will be accepted and approved by the Chief Remote Pilot.

0.3 Revision Log

Date	Affected sections	Summary of revision	Authorised by
20/02/2018	All Battery Management sections (2.4)	Additional battery management information included for all RPAS types; changing the section from a link to the DJI website, to a comprehensive list of management protocols	CRP
28/01/2021	All document	Update terminology throughout the document (e.g. chance Chief Controller to Chief Remote Pilot) and add a new section for a new type of drone (i.e. Quarternium Hybrix 2.1)	CRP
28/01/2021	Section 2	Add a section for a new type of drone (i.e. Quarternium Hybrix 2.1)	CRP
21/10/2022	Appendix 2 Appendix 3	BVLOS operations added Above 400ft added	CRP
25/08/2023	Section 2	DJI Mavic 3, hand catch and retrieval, and EVLOS procedures	CRP
23/11/2023	Section 2	DJI FPV procedures	CRP
23/07/2024	Section 2	DJI Mavic Mini 2 and 3, and EVLOS procedures removed as per CASA advice	CRP
11/11/2024	Section 2	DJI Mavic 3 enterprise (multi) added to library	CRP
17/04/2024	Section 2	Update procedures and add chapter on M350	
6/08/2025	Section 2	DJI Mavic 4 Pro added to library	

0.4 Acknowledgements

Section 1 – Company Procedures

1.1 Specialised Operations

1.1.1 Normal Procedures

- Establish clear area for take-off and landing zones. Southern Cross University will erect warning signs and place safety cones at a distance of 30mtrs from RPAS operations unless inside of a fully fenced work site. This is to clearly identify an area of operation and create an exclusion zone.
- Visual check local weather and if too windy, storms or raining, and if so cancel flight.
- Check Flight Authorisation for instructions regarding flight and perform JSA of the location. Fill out Risk Control Sheet. See Appendix 3, 4 & 7 of Operators Manual for sheet example. Brief crew and spotters of flight task have them listed on prestart.
- Prepare aircraft and accessories for flight.
- Carry out pre-flight inspection of Aircraft as per pre-flight inspection sheet using hardcopy or electronic version such as RPAS Logger plus.
- Check radio communication by turn on radio, listen to CTAF. If flying in a control zone broadcast message or call control tower on mobile to get clearance and message broadcast.
- Turn on aircraft when placed on the ground for departure and setup failsafe return to home function. Check video and camera setting.
- Start aircraft and flight timer after Failsafe function and lift off 2m to check stability and control.
- Return when fight complete or battery low. Pack up aircraft and signage.
- Perform post flight checklist.

1.1.2 Emergency Procedures

a. Injured Persons

First aid shall be given to treat any injuries received and transport to hospital shall be made using Medical services where proximity allows.

b. Fly Away or Visual Loss of RPA

Where an RPA is experiencing loss of control or is visually lost, all attempts shall be made to regain control or initiate the Return To Home procedure. Should these attempts fail, perform a combined stick movement to shut-down the motors with due regard for the location of the RPA so as not to increase the risk of collision with persons or property. The Remote Pilot will shout warning to people or use radio where necessary. The shut-down timing is crucial to control the RPA termination point within a safe area before the aircraft has the possibility to fly beyond the area of operation into areas over people/property etc. In the event of an uncontrolled Fly Away, the RPA will be deemed unserviceable pending inspection by the Maintenance Controller.

c. GPS Failure, Loss of Orientation

Follow the procedures as previously mentioned for Fly Away while monitoring the RPA heading to look for correct Return To Home flight path. Any incorrect flight behaviour during Return To Home procedure will be terminated and switching to Attitude Mode immediately and fly the RPA to a safe landing area. Any differing directional control where the stick input is mismatched to the RPA heading shall be accounted for by compensating the stick movement accordingly. Where the RPA is uncontrollable follow the motor shut-down procedures as described previously in Fly Away. The RPA will be deemed unserviceable pending inspection by the Maintenance Controller.

d. Battery Fire

- Smother the battery fire with sand and monitor the fire until exhausted while drenching the battery and surrounding area with water and or fire extinguisher/s as applicable to the surrounding hazards.
- WARNING- LiPo batteries can burn intensely and emit toxic fumes! Water can be used to put out the resultant fire caused by the battery but the battery itself can burn under water! Contact fire fighters if required DIAL 000.
- NEVER charge LiPo batteries unattended as this procedure creates a higher risk of battery fire. LiPo batteries can catch fire if the correct charging procedures are not followed or if they are damaged for example in a crash.
- In the event of a battery catch fire during flight, the RPA Remote Pilot should fly the RPA to the safe landing are and land as soon as fast as possible. If it is not safe to do this the RPA Remote Pilot should perform a combined stick movement to shut-down the motors with due regard for the location of the RPA so as not to increase the risk to persons or property.

e. Motor Failure

In the event of a motor failure, all attempts should be made to bring down the RPA immediately in a safe area. Follow procedures below referring to Crash. The RPA will be deemed unserviceable pending inspection by the Maintenance Controller.

f. Collision, Crash & 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. The RPA shall be immediately inspected for potential of a damaged battery to monitor the potential of a battery fire. The RPA will be deemed unserviceable pending inspection by the Maintenance Controller.

Public shall be restricted access to area until deemed safe.

1.1.3 Non-Normal Procedures

a. Operations within 3nm of an Aerodrome

Reserved

b. Night Operations, Cloud or conditions other than Day VMC

Reserved

c. Operations 30-15 Metres of People

See the SCU Operation Manual for requirements to undertake this non-standard operating procedure.

Any operation within 30 metres of non-operational personnel requires the following equipment as a minimum.

The RPA should have:

a dual parallel redundant battery system with duplicated battery mountings
demonstrated ability to fly safely with one motor inoperative at the maximum take-off weight for the operation
GPS hold and return to home function must be operational with a minimum reception of at least 7 GNSS satellites.

As part of the procedure for operation within 30 m of non-operational personnel the Chief Remote Pilot must, in addition to all other normal operational requirements, perform a detailed risk assessment that specifically considers the increased risk of operations in close proximity of people. The risk assessment is not limited to, but must consider, the following:

- speed of the machine
- size of the machine
- speed of the non-operational personnel
- non-operational personnel's awareness of the RPA's position at all times
- flight path in relation to non-operational personnel
- number of non-operational personnel involved
- position of controller in relation to RPA and non-operational personnel
- environment, wind, sun, lighting etc.
- possibility of GPS shadows or turbulence around buildings
- available safe options in event of control issues.

Once the risks to a particular operation have been identified the Chief Remote Pilot must implement sufficient strategies to mitigate the risks. Mitigation strategies are not limited to but include the following:

- Safety Crew to assist Remote Pilot
- restricted flight and duty times
- use of smaller or lighter RPA
- restrictions on flight profile
- reduced maximum wind speed
- different propellers
- propeller guards
- vertical separation
- RPA speed restrictions
- reduced number of non-operational personnel within 30m of RPA
- pre-determined plan of action in case of control or other issues.

If the risk cannot be mitigated to a value that meets an acceptable level of safety or it is not possible to comply with a condition within the operations manual and any other instrument issued by CASA the task should not proceed.

The Chief Remote Pilot must also consider the overall risk where multiple risk factors have a high score.

Consent of third parties

Any operation within 30 to 15m of a person(s) requires the consent of each individual. The Chief Remote Pilot should note that a body corporate or any other entity cannot give such consent on behalf of any individual. A written briefing should be provided to each person after which they will be asked to sign a consent form attached to the briefing (see Appendix 1).

d. Hand-over or take-over (HOTO) procedures

In normal operations, hand-over or take-over of the control of an RPA can only occur if prior authorisation of the CRP has been obtained.

HOTO procedures will generally only occur during normal operations when the aircraft is in stable flight with no issues. Prior to handover, the relieving pilot will have read and understood the flight plan and JSA, as well as signed off on the validation. The relieving pilot will be aware of the landing area, alternate landing areas, emergency dump sites and hazards. The procedures for hand-over require:

1) the remote pilot will hover the drone or put it into a slow circle flight pattern at greater than 40 m ASL and at a constant altitude in VLOS. The RPA will be well clear of any obstacles and there will be no events occurring (e.g. manned aircraft nearby);
2) the remote pilot will undertake a system and controllability check of the RPAS system including altitude, heading, aircraft battery level, controller battery level, satellite status, telemetry signal strength and any additional relevant aircraft status information.
3) the remote pilot will show the relieving pilot where the RPA is in the sky and the relieving pilot will acknowledge they have the RPA in VLOS.
4) the remote pilot will brief the relieving pilot on the status of the RPAS system, including altitude, heading, aircraft battery level, controller battery level, satellite status, telemetry signal strength and any additional aircraft status or mission information.
5) The relieving pilot will be allowed to ask any additional questions to ensure they are aware of all pertinent information.
6) Once both pilots agree, the remote pilot will clearly state they are handing control to the relieving pilot and then will pass over the controller. Once received the relieving pilot will clearly acknowledge they now have control of the aircraft.
7) The original remote pilot will then remain with the new remote pilot until it is clear there are no issues and they are dismissed by the new remote pilot.

The need for HOTO may arise in an emergency situation when the remote pilot is incapacitated (e.g. a medical emergency). Where possible the remote pilot will endeavour to hand over controls following the procedures for normal operations and the relieving remote pilot will fly the drone home, land safely and then prioritise the medical emergency. If this is not possible, the remote pilot or relieving remote pilot will instigate automated “return to home” procedures. If possible, the relieving pilot will attempt to take positive control during the “return to home” and land the aircraft safely. Else, the crew will ensure the landing area (home point) is clear and allow the drone to land automatically. If the landing area is not clear, the relieving pilot should take positive control and land

at the alternate landing site. If this is not possible, they should follow the procedures for an emergency fly away.

f. Taking off from, landing on and operating off a vessel at sea

As Southern Cross University is involved in marine research, an RPA could be required to take-off from and land on vessels at sea. The vessel should be anchored, if taking off or landing on the deck/helipad of a boat. The boat should either be anchored or stationary if hand catching and releasing an approved drone (see h). All people aboard the vessel should be willing and able to participate in the safe drone operation or the vessel needs to be large enough to ensure people not involved in the operation are at least 30 m from the RPA.

To operate drones from a vessel all the normal procedures apply. Additionally:

1) All people on the vessel should be inducted into the RPAS operation, read the flight plan, wear appropriate PPE, attend the pre-operational briefing and sign-off on the pre-operational briefing form.
2) An adequate take-off and landing area (dependant on the size of the drone) should be designated on the vessel and marked off using cones, signs and a helipad.
3) The swell should be slight with wind speeds < 12 kts.
4) The RPA should have the compass calibrated before each flight. The drone should be in GPS mode, and have contact with an appropriate number of satellites, a calibrated IMU and be free of magnetic interference.
5) During take-off and landing all personal should be behind the drone pilot and where possible completely protected from the RPA (e.g. inside an enclosed cabin).
6) During operations the RPA will remain in VLOS.
7) The 'return to home' point should be routinely checked and updated.
8) For take-off and landing, the remote pilot should be upwind of the RPA.
9) In the event of a controller failure, the skipper of the boat will make the decision whether to position the boat under an RPA that is automatically returning to home or whether to allow it to land in the water. In such a situation, reducing the risk of injury to people or damage to property should take priority.

g. Operations above 400 ft (120 m) ASL

As a research organisation, Southern Cross University may be involved in RPAS operations above 400 ft (ASL). Such operations require permission from CASA and an additional permission from Airservices, if it is in controlled airspace. These permissions must be obtained before an operation can proceed.

To operate an RPA above 400 ft (ASL), all the normal procedures will apply. When an RPA flies above 400 ft, the risk of the RPA colliding with manned aircraft increases. To reduce this risk:

1) The operational area should, where possible, be in a remote location and more than 10 NM from an aerodrome.
2) The RPA should be fitted with an ADS-B transponder that will (a) alert ATS, IFR (and VFR where ADS-B fitted) aircraft to the presence of the RPA and (b) provide real time data of RPA altitude and location (via OzRunways combined with an ADS-B receiver).
3) The remote pilot and crew will be on watch for any aircraft (particularly VFR aircraft without an ADS-B fitted) that enter the operational area. If an aircraft is spotted, the RPA will immediately be lowered to 300 ft.
4) Two independent airband radios should be on listening watch on the appropriate

frequency during operational hours. Radio broadcasts should be made on RPA take-off, on landing, or when the RPA passes 400 ft. If another aircraft is spotted in the operational area, a radio broadcast will be made indicating the RPA will be immediately lowered to 300 ft.

5) The "return to home" altitude should be set at 300 ft (if sensible). In the event that controller signal is lost, the drone will automatically go down to airspace where manned aircraft rarely operate.
6) In the event of failing controller or satellite signal, the remote pilot will immediately switch to manual (atti mode) and lower the drone down to 300 ft.
7) If a collision with another aircraft appears imminent, the remote pilot will perform an emergency engine shut down and use the emergency dump site.
8) If deemed necessary by a risk assessment, a NOTAM should be issued to alert aviation personnel about the RPA operation above 400 ft.
9) If deemed necessary by a risk assessment, the remote pilot should operate one radio and monitor the real time telemetry from the RPA. A second operator with a (remote) pilot and airband radio licence should operate the second radio and monitor the real time telemetry from the transponder and Ozrunways.

h. Hand retrieval for DJI Phantom and Mavic 3 drones (with plastic catch rails) only

In some circumstances, deemed appropriate by the Remote Pilot (and approved by the Chief Remote Pilot), hand retrieval shall be used as a safer alternative to landing the RPA in a confined space or when no alternative landing area is available (e.g. uneven ground or off a boat). This option is only available for DJI Phantom and Mavic 3 drones (with plastic catch rails) only. Consideration should be given to using prop guards to further reduce risk.

Hand retrieval of can only be undertaken by a trained staff member or volunteer, who accompanies the Remote Pilot. The remote pilot will not attempt to hand retrieve the RPA on their own and permission for hand retrieval must be given on the flight plan.

The "catcher" must wear anti-cut gloves; a sturdy wide brimmed hat; safety glasses; long sleeves; covered shoes.

The remote pilot will bring the RPA toward the landing site. The RPA will be lowered to an elevation of approximately 0.5 m above the catcher's head height. The Remote pilot will slowly bring the RPA to within 2 m of the catcher and then allow the drone to hover.

The remote pilot will vocally confirm RPA is ready to be retrieved. The catcher will then step forward until under the RPA, lift arms and place both hands firmly around each of the Phantom lower leg frames. The catcher will give a vocal signal that the RPA is under a firm grip. The remote pilot will then shut down the motors. The catcher will not move their hands until the propellers have come to a complete stop after which they will turn off the battery while still holding the drone with one hand.

Section 2a – DJI Phantom 3

2a.1 Pre-flight & Post-flight Check

DJI Phantom 3 Reg. No. _____					Mission name:
Mission Checklist					
☐	Airport(s) Notified:	☐	UAV Batteries Charged	☐	Gimbal Protector Installed
☐	Location is OK to fly		Battery 1 level:	☐	Propellers Packed
☐	Weather Forecast OK		Battery 2 level:	☐	Cables Packed
	Temperature:		Battery 3 level:	☐	Camera Filters Packed
	Wind:		Battery 4 level:	☐	Sun Shade Packed
	Precipitation:	☐	Controller Charged	☐	Tools Packed
☐	Firmware up-to-date	☐	Tablet Charged	☐	Flight Plan designed/entered in software
☐	MicroSD Card Formatted	☐	Mobile Phone Charged	☐	Log Book Packed

Launch Site Checklist			
☐	Verify Weather is OK to Fly	☐	Check for obstacles, interference
	Temperature:	☐	Check for nearby human activity/dangerous situations
	Wind:	☐	Verify Launch Pad is down-wind from observers
	Precipitation:	☐	Launch Pad/Barriers Placed Signage in position as per JSA
☐	**Safety Briefing**		

Equipment Checklist					
☐	Airframe/Landing gear inspected	☐	SD Card Installed	☐	Gimbal/Lens Protector Removed
☐	Propellers Inspected/Attached	☐	Battery Installed	☐	Camera Filters Installed
☐	Controller/Tablet Assembled				

Pre-Flight Checklist			
☐	Aircraft Placed on Launch Pad	☐	Check RC battery level
☐	Turn on Remote Controller	☐	Check Aircraft Battery Level

☐	Antennas Properly Positioned	☐	Check flight mode switch (P-Mode)
☐	Turn on Aircraft	☐	Check Satellite and Compass status
☐	Check the aircraft status LEDs	☐	Set RTH Location and height
☐	Verify the gimbal is level, can move unobstructed	☐	Check camera settings
☐	Turn on radio (if required) and check frequency is correct as per JSA. Volume up.		

Take-Off Checklist			
☐	Check launch site is clear for take off	☐	Make sure the aircraft is stable while hovering
☐	Start the motors. Announce "TAKE OFF"	☐	Check flight controls, make sure they respond as expected
☐	Take off and hover	☐	Start recording video

Post Flight Checklist					
☐	Remove Battery from Aircraft & off	☐	Install Gimbal Guard	☐	Repack all equipment
	Condition of components checked: ☐ Camera (checked & off) ☐ Overall condition of frame (cracks, moisture, dust) ☐ Screws & fasteners; wiring ☐ Propellers				
☐	**Complete the Flight Log**				

2a.2 Maintenance Schedule

Pre and post flight inspections are undertaken so that any minor or major defect can be identified and rectified. Any sign of damage that may inhibit the operation of the RPAS should result in replacement of the component/s.

Component	Due (Calendar)	Due (time)	Added to Flight Log
Frame	On Condition	On Condition	N/A
ESC	On Condition	On Condition	N/A
Motor	On Condition	On Condition	N/A
Propeller	On Condition	On Condition	N/A
Flight Controller	On Condition	On Condition	N/A

Firmware	As per manufacturer release	N/A	N/A
Receiver	On Condition	On Condition	N/A
Transmitter	On Condition	On Condition	N/A
GNSS receiver	On Condition	On condition	N/A

2a.3 RPAS Maintenance & Operational Manual(s)

Copy of UAV Flight manual is kept in hardcopy in the office or can be also obtained from the web links.

Aircraft type	Title	Web link
DJI Phantom 3	User manual	https://dl.djicdn.com/downloads/phantom_3/en/Phantom+3+Professional+User+Manual+v1.8_en_20160719.pdf
	Quick Start Guide	https://dl.djicdn.com/downloads/phantom_3/en/Phantom_3_Professional_Quick_Start_GuideV1.2_0419.pdf
	Firmware update	see DJI website for latest version
	Online tutorials	http://www.dji.com/product/phantom-3-pro/info - video

2a.4 Battery Management

All battery management details for this and all following RPAS types were kindly provided by DPI NSW RPAS Operations Library (Feb 2018)

DJI Phantom smart batteries must be used in accordance with the safety guidelines provided by DJI. A hard copy of the DJI smart flight battery safety guidelines is available from the Chief Remote Pilot. Safety guidelines can be downloaded here:

https://www.dji.com/phantom-3-pro/info#downloads

Each individual battery must be numbered and all flight time logged as part of the RPAS flight log procedure. Charge cycles must be balanced after the last flight of the day or prior to the first flight of the day. All other charges are not required to be balanced.

Where possible, battery systems should not be stored in a fully charged state for periods of more than 1 week.

Flights should commence only with fully charged batteries.

All batteries must be charged with a suitable charging system in accordance with that chargers instructions.

Flights shall be conducted with a known starting battery percentage shown by an independent testing system that is not a part of the UAVs onboard system. Controllers are to ensure that battery power is available for the duration of the planned flight.

When in flight, battery capacity remaining may be determined by:

- Amount used in MAH compared to capacity (if fitted with a current sensor)
- Flight time
- Indicated Battery Voltage/Onboard Battery Voltage Alert

Where no telemetry data is available, it is acceptable to operate to a known flight time only.

Where only flight time is used, a minimum battery percentage of 90% is required prior to flight.

Where other telemetry data is available, a combination of methods shall be used.

Flights should only operate to 85% of battery capacity remaining.

eg, 3S 5200 MAH 11.1v battery may use 4420 MAH.

Note: Momentary fluctuations below voltage are permitted under high load situations such as a maximum rate climb; this may cause a Battery Voltage Alert system to momentarily activate.

Flights that exceed any limitation must land as soon as it is safe to do so. A flight must not knowingly exceed any limitation.

Computer based logging of all battery data is recommended via systems approved by the Maintenance Controller.

Battery conditions are to be monitored by each Remote Pilot. Any defects or discrepancies shall be notified to the Maintenance Controller with the affected components company ID number.

Any battery found to not meet expectations such as:

- Charging to a significantly less than rated capacity amount (20% less)
- Pre flight indications of less than 80% when fully charged
- Unexpectedly discharging more rapidly than expected (25% less flight time)
- Charging Faults
- Significant individual cell voltage differences (0.9v) during balanced charging.
- Significant cell expansion
- Signs of visible damage not as a result of normal wear and tear.

must not be used for commercial operations until the Maintenance Controller determines the battery as serviceable. External maintenance providers may be used to assist in this process in consultation with the Maintenance Controller. Disposal of an unserviceable battery must be completed in accordance with State legislation and manufactures recommendations (if any).

Section 2b – DJI Phantom 4

2b.1 Pre-flight & Post-flight Check

Refer to the latest DJI Phantom 4 User Manual.
(https://dl.djicdn.com/downloads/phantom_4/it/Phantom_4_User_Manual_v1.2_20160822.pdf)

DJI PHANTOM 4 CHECKLIST : RPAS Reg. No. _____					Mission name:
Mission Checklist					
☐	Airport(s) Notified:	☐	UAV Batteries Charged	☐	Gimbal Protector Installed
☐	Location is OK to fly		Battery 1 level:	☐	Propellers Packed
☐	Weather Forecast OK		Battery 2 level:	☐	Cables Packed
	Temperature:		Battery 3 level:	☐	Camera Filters Packed
	Wind:		Battery 4 level:	☐	Sun Shade Packed
	Precipitation:	☐	Controller Charged	☐	Tools Packed
☐	Firmware up-to-date	☐	Tablet Charged	☐	Flight Plan designed/entered in software
☐	MicroSD Card Formatted	☐	Mobile Phone Charged	☐	Log Book Packed

Launch Site Checklist			
☐	Verify Weather is OK to Fly	☐	Check for obstacles, interference
	Temperature:	☐	Check for nearby human activity/dangerous situations
	Wind:	☐	Verify Launch Pad is down-wind from observers
	Precipitation:	☐	Launch Pad/Barriers Placed Signage in position as per JSA
☐	**Safety Briefing**		

Equipment Checklist					
☐	Airframe/Landing gear inspected	☐	SD Card Installed	☐	Gimbal/Lens Protector Removed
☐	Propellers Inspected/Attached	☐	Battery Installed	☐	Camera Filters Installed
☐	Controller/Tablet Assembled				

Pre-Flight Checklist			
☐	Aircraft Placed on Launch Pad	☐	Check RC battery level
☐	Turn on Remote Controller	☐	Check Aircraft Battery Level
☐	Antennas Properly Positioned	☐	Check flight mode switch (P-Mode)
☐	Turn on Aircraft	☐	Check Satellite and Compass status
☐	Check the aircraft status LEDs	☐	Set RTH Location and height
☐	Verify the gimbal is level, can move unobstructed	☐	Check camera settings
☐	Turn on radio (if required) and check frequency is correct as per JSA. Volume up.		

Take-Off Checklist			
☐	Check launch site is clear for take off	☐	Make sure the aircraft is stable while hovering
☐	Start the motors. Announce "TAKE OFF"	☐	Check flight controls, make sure they respond as expected
☐	Take off and hover	☐	Start recording video

Post Flight Checklist					
☐	Remove Battery from Aircraft & off	☐	Install Gimbal Guard	☐	Repack all equipment
	Condition of components checked: ☐ Camera (checked & off) ☐ Overall condition of frame (cracks, moisture, dust) ☐ Screws & fasteners; wiring ☐ Propellers				
☐	**Complete the Flight Log**				

2b.2 Maintenance Schedule

Pre and post flight inspections are undertaken so that any minor or major defect can be identified and rectified. Any sign of damage that may inhibit the operation of the RPAS should result in replacement of the component/s.

Component	Due (Calendar)	Due (time)	Added to Flight Log
Frame	On Condition	On Condition	N/A
ESC	On Condition	On Condition	N/A
Motor	On Condition	On Condition	N/A

Propeller	On Condition	On Condition	N/A
Flight Controller	On Condition	On Condition	N/A
Firmware	As per manufacturer release	N/A	N/A
Receiver	On Condition	On Condition	N/A
Transmitter	On Condition	On Condition	N/A
GNSS receiver	On Condition	On condition	N/A

2b.3 RPAS Maintenance & Operational Manual(s)

Copy of UAV Flight manual is kept in hardcopy in the office or can be also obtained from the web links.

Aircraft type	Title	Web link
DJI Phantom 4	User manual	https://dl.djicdn.com/downloads/phantom_4/it/Phantom_4_User_Manual_v1.2_20160822.pdf
	Quick Start Guide	https://dl.djicdn.com/downloads/phantom_4/en/Phantom_4_Quick_Start_Guide_v1.2_en_160317.pdf
	Firmware update	see DJI website for latest version
	Online tutorials	https://www.dji.com/phantom-4/info

2b.4 Battery Management

DJI Phantom smart batteries must be used in accordance with the safety guidelines provided by DJI. A hard copy of the DJI smart flight battery safety guidelines is available from the Chief Remote Pilot. Safety guidelines can be downloaded here:

https://www.dji.com/phantom-4-pro/info#downloads

Each individual battery must be numbered and all flight time logged as part of the RPAS flight log procedure. Charge cycles must be balanced after the last flight of the day or prior to the first flight of the day. All other charges are not required to be balanced.

Where possible, battery systems should not be stored in a fully charged state for periods of more than 1 week.

Flights should commence only with fully charged batteries.

All batteries must be charged with a suitable charging system in accordance with that chargers instructions.

Flights shall be conducted with a known starting battery percentage shown by an independent testing system that is not a part of the UAVs onboard system. Controllers are to ensure that battery power is available for the duration of the planned flight.

When in flight, battery capacity remaining may be determined by:

- Amount used in MAH compared to capacity (if fitted with a current sensor)
- Flight time
- Indicated Battery Voltage/Onboard Battery Voltage Alert

Where no telemetry data is available, it is acceptable to operate to a known flight time only.

Where only flight time is used, a minimum battery percentage of 90% is required prior to flight.

Where other telemetry data is available, a combination of methods shall be used.

Flights should only operate to 85% of battery capacity remaining.

eg, 3S 5200 MAH 11.1v battery may use 4420 MAH.

Note: Momentary fluctuations below voltage are permitted under high load situations such as a maximum rate climb; this may cause a Battery Voltage Alert system to momentarily activate.

Flights that exceed any limitation must land as soon as it is safe to do so. A flight must not knowingly exceed any limitation.

Computer based logging of all battery data is recommended via systems approved by the Maintenance Controller.

Battery conditions are to be monitored by each Remote Pilot. Any defects or discrepancies shall be notified to the Maintenance Controller with the affected components company ID number.

Any battery found to not meet expectations such as:

- Charging to a significantly less than rated capacity amount (20% less)
- Pre flight indications of less than 80% when fully charged
- Unexpectedly discharging more rapidly than expected (25% less flight time)
- Charging Faults
- Significant individual cell voltage differences (0.9v) during balanced charging.
- Significant cell expansion
- Signs of visible damage not as a result of normal wear and tear

must not be used for commercial operations until the Maintenance Controller determines the battery as serviceable. External maintenance providers may be used to assist in this process in consultation with the Maintenance Controller. Disposal of an unserviceable battery must be completed in accordance with State legislation and manufactures recommendations (if any).2.1

Section 2c – DJI Inspire 2

2c.1 Pre-flight & Post-flight Check

A CASA approved checklist is to be used for any DJI Inspire flight and must not be altered in any way unless authorised by the Chief Remote Pilot.

All checklists MUST be read, not called out by memory. A systematic approach to ticking off all items on the checklist is required.

Refer to the latest DJI Inspire User Manual for manufacturers guidelines on flight operation. (http://www.dji.com/product/inspire-2/info#downloads)

SITE & SAFETY		TICK
All company documentation packed	Complete	
Check for people or animals	Complete	
Briefings of personnel	Complete	
First Aid kit identified and accessible	Identified	
Signage	Complete	
Weather conditions suitable	Checked and noted	
RPAS FIT FOR FLIGHT		
Visually inspect the airframe	Checked	
Overall condition/cracks	Checked	
Screws and fasteners secure	Checked	
Wiring	Checked	
Connectors	Checked	
Engine & mounting screws	Checked	
Arms	Checked	
Propellers	Checked	
Camera equipment	Checked	
Transmission antennas	Checked	
Ground station (if required)	Checked	
Service check	checked	
PRE FLIGHT		
Battery mounting	Checked	
Battery	Checked	

RC tramsitter Ground station (if required) Connect battery and power up LED indicators and tones Home location Ground station Camera equipment	ON and checked ON and checked Checked Locked Checked PRESS RECORD	
TAKE OFF		
Ensure all people in vicinity are aware of take off Increase throttle and listen for abnormalities Hover RPAS for 5 – 10 seconds @ 1-2 m	Announce “take off”	
POST FLIGHT (inspection)		
Disconnect battery Camera equipment Battery Overall condition/cracks Screws and fasteners Wiring Connectors Engines and mounting screws Arms Propellers Transmission antennas Complete flight log AND battery log	Checked & off Checked & off Checked Checked Checked Checked Checked Checked Checked Checked Checked completed	

2c.2 Maintenance Schedule

Component	Due (Calendar)	Due (time)	Added to Flight Log
Frame	On Condition	On Condition	N/A
ESC	On Condition	On Condition	N/A
Motor	On Condition	On Condition	N/A
Propeller	On Condition	On Condition	N/A

Flight Controller	On Condition	On Condition	N/A
Firmware	As per manufacturer release	N/A	N/A
Receiver	On Condition	On Condition	N/A
Transmitter	On Condition	On Condition	N/A
GNSS receiver	On Condition	On condition	N/A

2c.3 RPAS Maintenance & Operational Manual(s)

Copy of UAV Flight manual is kept in hardcopy in the office or can be also obtained from the web links.

Aircraft type	Title	Web link
DJI Inspire I	User manual	http://www.dji.com/inspire-2/info#downloads
	Quick Start Guide	https://dl.djicdn.com/downloads/inspire_2/update/Inspire+2+Quick+Start+Guide+v1.0.pdf
	Firmware update	see DJI website for latest version
	Online tutorials	http://www.dji.com/inspire-2/info#downloads

2c.4 Battery Management

DJI Inspire smart batteries must be used in accordance with the safety guidelines provided by DJI. Safety guidelines can be downloaded here:

https://dl.djicdn.com/downloads/inspire_2/20170120/INSPIRE+2+Intelligent+Flight+Battery+Safety+Guidelines.pdf

Each individual battery must be numbered and all flight time logged as part of the RPAS flight log procedure. Charge cycles must be balanced after the last flight of the day or prior to the first flight of the day. All other charges are not required to be balanced.

Where possible, battery systems should not be stored in a fully charged state for periods of more than 1 week.

Flights should commence only with fully charged batteries.

All batteries must be charged with a suitable charging system in accordance with that chargers instructions.

Flights shall be conducted with a known starting battery percentage shown by an independent testing system that is not a part of the UAVs onboard system. Controllers are to ensure that battery power is available for the duration of the planned flight.

When in flight, battery capacity remaining may be determined by:

- Amount used in MAH compared to capacity (if fitted with a current sensor)
- Flight time
- Indicated Battery Voltage/Onboard Battery Voltage Alert

Where no telemetry data is available, it is acceptable to operate to a known flight time only.

Where only flight time is used, a minimum battery percentage of 90% is required prior to flight.

Where other telemetry data is available, a combination of methods shall be used.

Flights should only operate to 85% of battery capacity remaining.

eg, 3S 5200 MAH 11.1v battery may use 4420 MAH.

Note: Momentary fluctuations below voltage are permitted under high load situations such as a maximum rate climb; this may cause a Battery Voltage Alert system to momentarily activate.

Flights that exceed any limitation must land as soon as it is safe to do so. A flight must not knowingly exceed any limitation.

Computer based logging of all battery data is recommended via systems approved by the Maintenance Controller.

Battery conditions are to be monitored by each Remote Pilot. Any defects or discrepancies shall be notified to the Maintenance Controller with the affected components company ID number.

Any battery found to not meet expectations such as:

- Charging to a significantly less than rated capacity amount (20% less)
- Pre flight indications of less than 80% when fully charged
- Unexpectedly discharging more rapidly than expected (25% less flight time)
- Charging Faults
- Significant individual cell voltage differences (0.9v) during balanced charging.
- Significant cell expansion
- Signs of visible damage not as a result of normal wear and tear.

must not be used for commercial operations until the Maintenance Controller determines the battery as serviceable. External maintenance providers may be used to assist in this process in consultation with the Maintenance Controller. Disposal of an unserviceable battery must be completed in accordance with State legislation and manufactures recommendations (if any).

Section 2d – DJI Matrice 210 RTK

2d.1 Pre-flight & Post-flight Check

A CASA approved checklist is to be used for any DJI Inspire flight and must not be altered in any way unless authorised by the Chief Remote Pilot.

All checklists MUST be read, not called out by memory. A systematic approach to ticking off all items on the checklist is required.

Refer to the latest DJI Inspire User Manual for manufacturers guidelines on flight operation. . (http://www.dji.com/matrice-200-series/info#downloads

SITE & SAFETY		TICK
All company documentation packed Check for people or animals Briefings of personnel First Aid kit identified and accessible Signage Weather conditions suitable	Complete Complete Complete Identified Complete Checked and noted	
RPAS FIT FOR FLIGHT		
Visually inspect the airframe Overall condition/cracks Screws and fasteners secure Wiring Connectors Engine & mounting screws Arms Propellers Camera equipment Transmission antennas Ground station (if required) Service check	Checked Checked Checked Checked Checked Checked Checked Checked Checked Checked Checked checked	
PRE FLIGHT		
Battery mounting Battery	Checked Checked	

RC tramsitter Ground station (if required) Connect battery and power up LED indicators and tones Home location Ground station Camera equipment	ON and checked ON and checked Checked Locked Checked PRESS RECORD	
TAKE OFF		
Ensure all people in vicinity are aware of take off Increase throttle and listen for abnormalities Hover RPAS for 5 – 10 seconds @ 1-2 m	Announce “take off”	
POST FLIGHT (inspection)		
Disconnect battery Camera equipment Battery Overall condition/cracks Screws and fasteners Wiring Connectors Engines and mounting screws Arms Propellers Transmission antennas Complete flight log AND battery log	Checked & off Checked & off Checked Checked Checked Checked Checked Checked Checked Checked Checked completed	

2d.2 Maintenance Schedule

Component	Due (Calendar)	Due (time)	Added to Flight Log
Frame	On Condition	On Condition	N/A
ESC	On Condition	On Condition	N/A
Motor	On Condition	On Condition	N/A
Propeller	On Condition	On Condition	N/A

Flight Controller	On Condition	On Condition	N/A
Firmware	As per manufacturer release	N/A	N/A
Receiver	On Condition	On Condition	N/A
Transmitter	On Condition	On Condition	N/A
GNSS receiver	On Condition	On condition	N/A

2d.3 RPAS Maintenance & Operational Manual(s)

Copy of UAV Flight manual is kept in hardcopy in the office or can be also obtained from the web links.

Aircraft type	Title	Web link
DJI Matrice 210 RTK	User manual	http://www.dji.com/matrice-200-series/info#downloads
	Quick Start Guide	http://www.dji.com/matrice-200-series/info#downloads
	Firmware update	see DJI website for latest version
	Online tutorials	http://www.dji.com/matrice-200-series/info#video

2d.4 Battery Management

All batteries are automatically monitored by the inbuilt software in the “Smart” system

All batteries must be charged with a suitable DJI charger system for the battery type.

Where possible, battery systems should not be stored in a fully charged state for extended periods of time (in excess of 1 week).

Flights shall be conducted with a known starting battery percentage shown by the UAVs

onboard system. Remote Pilots are to ensure that battery power is available for the duration of the planned flight.

When in flight, battery capacity remaining may be determined by:

- Amount used in MAH compared to capacity (if fitted with a current sensor)
- Flight time
- Indicated Battery Voltage/Onboard Battery Voltage Alert

Where no telemetry data is available, it is acceptable to operate to a known flight time only.

Where only flight time is used, a minimum battery percentage of 90% is required prior to flight.

Where other telemetry data is available, a combination of methods shall be used.

Flights should only operate to 15% of battery capacity remaining.

eg, 6S 4500 MAH 22.2v battery may use 3825MAH.

Note: Momentary fluctuations below voltage are permitted and are generally correctly ignored by the DJI Inspire 1's onboard system.

Flights that exceed any limitation must land as soon as it is safe to do so. A flight must not knowingly exceed any limitation.

Battery conditions are to be monitored by each Remote Pilot. Any defects or discrepancies shall be notified to the Maintenance Controller with the affected components company ID number.

Any battery found to not meet expectations such as:

- Failing in the onboard system test (Battery Monitoring System)
- Pre flight indications of less than 80% when fully charged
- Unexpectedly discharging more rapidly than expected (25% less flight time)
- Charging Faults
- Significant individual cell voltage differences (0.9v) during charging.
- Significant cell expansion
- Signs of visible damage not as a result of normal wear and tear

must not be used for commercial operations until the Maintenance Controller determines the battery as serviceable. External maintenance providers may be used to assist in this process in consultation with the Maintenance Controller. Disposal of an unserviceable battery must be completed in accordance with State legislation and manufactures recommendations (if any).

Section 2e – DJI Matrice 300 RTK

2e.1 Pre-flight & Post-flight Check

A CASA approved checklist is to be used for any DJI M300 flight and must not be altered in any way unless authorised by the Chief Remote Pilot.

All checklists MUST be read, not called out by memory. A systematic approach to ticking off all items on the checklist is required.

Refer to the latest DJI Matrice 300 User Manual for manufacturers guidelines on flight operation. (https://dl.djicdn.com/downloads/matrice-300/20220509/M300_RTK_User_Manual_EN_v3.2_1.pdf)

SITE & SAFETY		TICK
All company documentation packed	Complete	
Check for people or animals	Complete	
Briefings of personnel	Complete	
First Aid kit identified and accessible	Identified	
Signage	Complete	
Weather conditions suitable	Checked and noted	
RPAS FIT FOR FLIGHT		
Visually inspect the airframe	Checked	
Overall condition/cracks	Checked	
Screws and fasteners secure	Checked	
Wiring	Checked	
Connectors	Checked	
Engine & mounting screws	Checked	
Arms	Checked	
Propellers	Checked	
Motors	Checked	
Camera equipment	Checked	
Transmission antennas	Checked	
Ground station (if required)	Checked	
Service check	Checked	
PRE FLIGHT		
Battery mounting	Checked	
Battery	Checked	

RC transmitter Ground station (if required) Connect battery and power up LED indicators and tones Home location Ground station Camera equipment	ON and checked ON and checked Checked Locked Checked PRESS RECORD	
TAKE OFF		
Ensure all people in vicinity are aware of take off Increase throttle and listen for abnormalities Hover RPAS for 5 – 10 seconds @ 1-2 m	Announce “take off”	
POST FLIGHT (inspection)		
Disconnect battery Camera equipment Battery Overall condition/cracks Screws and fasteners Wiring Connectors Engines and mounting screws Arms Propellers Transmission antennas Complete flight log AND battery log	Checked & off Checked & off Checked Checked Checked Checked Checked Checked Checked Checked Checked completed	

2e.2 Maintenance Schedule

The M300 maintenance manual can be downloaded here:

https://dl.djicdn.com/downloads/matrice-300/20220620/M300_RTK_Maintenance_Manual_v1.2_EN_.pdf

Component	Due (Calendar)	Due (time)	Added to Flight Log
Frame	On Condition	On Condition	N/A
ESC	On Condition	On Condition	N/A
Motor	On Condition	On Condition	N/A

Propeller	On Condition	On Condition	N/A
Flight Controller	On Condition	On Condition	N/A
Firmware	As per manufacturer release	N/A	N/A
Receiver	On Condition	On Condition	N/A
Transmitter	On Condition	On Condition	N/A
GNSS receiver	On Condition	On condition	N/A

REGULAR MAINTENANCE

It is recommended to perform inspection and maintenance regularly by following the items below to keep the aircraft in a good condition and reduce safety risks.

Type	Maintenance Items	Maintenance Advice	Period
Basic Maintenance	1. Regular maintenance items 2. Updates and calibration 3. Deep cleaning	It is recommended to return to the factory or contact an authorized agent.	Total flight time is 200 hours, or the product has been used for 6 months.
Routine Maintenance	1. Regular maintenance items 2. Updates and calibration 3. Deep cleaning 4. Components replacement due to wear and tear	Factory Settings	Total flight time is 400 hours, or the product has been used for 12 months.
Deep Maintenance	1. Regular maintenance items 2. Updates and calibration 3. Deep cleaning 4. Components replacement due to wear and tear 5. Core component replacement	Factory Settings	Total flight time is 600 hours, or the product has been used for 18 months.

2e.3 RPAS Maintenance & Operational Manual(s)

Copy of UAV Flight manual is kept in hardcopy in the office or can be also obtained from the web links.

Aircraft type	Title	Web link
DJI Matrice 300 RTK	User Manual	https://dl.djicdn.com/downloads/matrice-300/20220509/M300_RTK_User_Manual_EN_v3.2_1.pdf
	Quick Start Guide	https://dl.djicdn.com/downloads/matrice-300/20220311QSG/M300_RTK_Quick_Start_Guide_V1.4.pdf
	Maintenance Manual	https://dl.djicdn.com/downloads/matrice-300/20220620/M300_RTK_Maintenance_Manual_v1.2_EN_.pdf

	Disclaimer and Safety Guidelines	https://dl.djicdn.com/downloads/matrice-300/20200928/M300_RTK_Intelligent_Flight_Battery_Safety_Guidelines_V1.2.pdf
	Known Issue List	https://dl.djicdn.com/downloads/matrice-300/20220511KIL/M300_RTK_V4_Known_Issue_List_EN_20210511.pdf
	Intelligent Flight Battery Safety Guidelines	https://dl.djicdn.com/downloads/matrice-300/20200928/M300_RTK_Intelligent_Flight_Battery_Safety_Guidelines_V1.2.pdf
	Firmware Update	See DJI website for latest version
	Online Tutorials	https://www.dji.com/au/matrice-300/video

2e.4 Battery Management

The DJI M300 Intelligent Flight Batteries must be used in accordance with the safety guidelines provided by DJI. Safety guidelines and user manuals can be downloaded here (or see above):

https://www.dji.com/au/matrice-300/downloads

The M300 Intelligent Flight Battery applies has the capacity of 5935 mAh at a nominal voltage of 52.8 V. This product must be operated with caution and expertise.

BATTERY USE

1.) Make sure the battery is fully charged before each flight.
2.) Land the aircraft immediately when the low battery level warning activates in the DJI Pilot app. Replace or recharge the battery.
3.) Before first use, it is recommended to mark two batteries as a pair and continue using them as a pair (charge and discharge them together) to maximize service life and ensure flight performance. The aircraft my fail to take off if the two batteries have different power levels.

BATTERY MAINTENANCE CONDITIONS

Maintenance is required when any of the events below occur.
Every 50 cycles.
The battery is idle for more than three months.
There is a maintenance prompt in the app.

CHECKLIST FOR BATTERY MAINTENANCE

1.) Charge and discharge the battery as per instructions.
2.) Make sure the cell voltage difference is less than 0.1 V after the battery is fully charged and left stationary for six hours.
3.) Make sure the battery is not swollen, leaky, or damaged.
4.) Make sure battery terminals are clean.
5.) Make sure the battery firmware is updated to the latest version.

STANDARD CHARGE AND DISCHARGE OPERATION INSTRUCTIONS

1.) Charge the battery to 100% and leave the battery stationary for more than 24 hours.
2.) Install the battery into the aircraft before flight. If the remaining power level is less than 20%, land the aircraft and remove the battery.
3.) Leave the battery stationary for more than six hours.
4.) Charge the battery to 100% power level.
5.) Repeat the above steps.

BATTERY REPLACEMENT STANDARD

1.) The battery is visibly swollen, leaky, or damaged.
2.) There is a prompt of battery cell damage or over discharge in the app.
3.) The battery is rated for 200 cycles. It is not recommended to continue use afterward.
4.) The battery error still exists after performing the standard charge and discharge operations twice continuously.

BATTERY DISPOSAL

1.) Fully fill in an insulated bucket with 5% salt solution. Put the battery into it for more than 48 hours to fully discharge the battery.
2.) It is recommended to recycle the battery by a recycling agent to avoid environmental pollution.

EMERGENCIES

1.) Put out any battery fire using sand or a dry powder fire extinguisher.
2.) Put the battery into 5% salt solution immediately if the battery shell has visible damage. DO NOT use the battery afterward.
3.) If any electrolytes make contact with your skin, immediately wash the affected area with clean running water or alkaline hand sanitizer for at least 15 minutes. See a doctor immediately.

WARNINGS

1.) It is recommended to charge and discharge the battery in a special explosion-proof cabinet.
2.) DO NOT charge the battery near flammable materials, objects or on flammable surfaces.
3.) DO NOT use the battery in a humid environment to avoid shot circuit.
4.) Never disassemble or pierce the battery in any way.
5.) Store Intelligent Flight Batteries in a well-ventilated and dry place.
6.) Initial RTH immediately when the battery temperature is 80° C (176° F) or higher.

GENERAL BATTERY MANAGEMENT

Each individual battery must be numbered, and all flight time logged as part of the RPAS flight log procedure.

Batteries must be charged with a suitable DJI charger system for the battery type.
Flights shall be conducted with a known starting battery percentage shown by the UAVs onboard system. Remote Pilots are to ensure that battery power is available for the duration of the

planned flight.
Flights should only operate to 15% of battery capacity remaining.
Flights that exceed any limitation must land as soon as it is safe to do so. A flight must not knowingly exceed any limitation.

Battery conditions are to be monitored by each Remote Pilot. Any defects or discrepancies shall be notified to the Maintenance Controller with the affected components company ID number.

Any battery found to not meet expectations such as:

- Failing in the onboard system test (Battery Monitoring System)
- Pre flight indications of less than 80% when fully charged
- Unexpectedly discharging more rapidly than expected (25% less flight time)
- Charging Faults
- Significant individual cell voltage differences (0.9v) during charging.
- Significant cell expansion
- Signs of visible damage not as a result of normal wear and tear

must not be used for commercial operations until the Maintenance Controller determines the battery as serviceable. External maintenance providers may be used to assist in this process in consultation with the Maintenance Controller. Disposal of an unserviceable battery must be completed in accordance with State legislation and manufactures recommendations (if any).

M300 INTELLIGENCE FLIGHT BATTERY SPECIFICATIONS

Nominal Voltage: 52.8 V
Battery Type: LiPo Battery 12S
Operating Temperate Range: -20°C to 50°C
Storing Temperate Range: 22°C to 30°C
Charging Temperate Range: 5°C to 40°C
Compatible Charging Device: BS60 Intelligent Battery Station
Capacity: 5935 mAh
Energy: 274 Wh
Battery Charging Time: 220V input: 60 mins (fully charging 2 x TB60 batteries)
30 mins (charge 2 x TB60 batteries from 20% to 90%)
110V input: 70 mins (fully charging 2 x TB60 batteries)
40 mins (charge 2 x TB60 batteries from 20% to 90%)
Max Charging Power: 470 W
Weight: ~1.35 kg (single battery)

Section 2f – DJI Matrice 600

2f.1 Pre-flight & Post-flight Check

All checklists MUST be read, not called out by memory. A systematic approach to ticking off all items on the checklist is required.

Refer to the latest DJI Matrice User Manual for manufacturers guidelines on flight operation. (https://www.dji.com/matrice600/info#downloads)

SITE & SAFETY		TICK
All company documentation packed	Complete	
Check for people or animals	Complete	
Briefings of personnel	Complete	
First Aid kit identified and accessible	Identified	
Signage	Complete	
Weather conditions suitable	Checked and noted	
RPAS FIT FOR FLIGHT		
Visually inspect the airframe	Checked	
Overall condition/cracks	Checked	
Screws and fasteners secure	Checked	
Wiring	Checked	
Connectors	Checked	
Engine & mounting screws	Checked	
Arms	Checked	
Propellers	Checked	
Camera equipment	Checked	
Transmission antennas	Checked	
Ground station (if required)	Checked	
Daily Certification	checked	
PRE FLIGHT		
Battery mounting	Checked	
Battery	Checked	
RC tramsitter	ON and checked	
Ground station (if required)	ON and checked	

Connect battery and power up LED indicators and tones Home location Ground station Camera equipment	 Checked Locked Checked PRESS RECORD	
TAKE OFF		
Ensure all people in vicinity are aware of take off Increase throttle and listen for abnormalities Hover RPAS for 5 – 10 seconds @ 1-2 m	Announce “take off”	
POST FLIGHT (inspection)		
Disconnect battery Camera equipment Battery Overall condition/cracks Screws and fasteners Wiring Connectors Engines and mounting screws Arms Propellers Transmission antennas Complete flight log AND battery log	Checked & off Checked & off Checked Checked Checked Checked Checked Checked Checked Checked Checked completed	

2f.2 Maintenance Schedule

Component	Due (Calendar)	Due (time)	Added to Flight Log
Frame	On Condition	On Condition	N/A
ESC	On Condition	On Condition	N/A
Motor	On Condition	On Condition	N/A
Propeller	On Condition	On Condition	N/A
Flight Controller	On Condition	On Condition	N/A
Firmware	As per manufacturer release	N/A	N/A

Receiver	On Condition	On Condition	N/A
Transmitter	On Condition	On Condition	N/A
GNSS receiver	On Condition	On condition	N/A

2f.3 RPAS Maintenance & Operational Manual(s)

Copy of UAV Flight manual is kept in hardcopy in the office or can be also obtained from the web links.

Aircraft type	Title	Web link
DJI Matrice 600	User manual	https://www.dji.com/matrice600/info#downloads
	Quick Start Guide	https://www.dji.com/matrice600/info#downloads
	Firmware update	see DJI website for latest version
	Online tutorials	https://www.dji.com/matrice600/info#video

2f.4 Battery Management

DJI Matrice 600 smart batteries must be used in accordance with the safety guidelines provided by DJI. Safety guidelines can be downloaded here:

https://www.dji.com/matrice600/info#downloads

Each individual battery must be numbered and all flight time logged as part of the RPAS flight log procedure.

Where possible, battery systems should not be stored in a fully charged state for periods of more than 1 week.

Flights should commence only with fully charged batteries.

All batteries are automatically monitored by the inbuilt software in the “Smart” system

All batteries must be charged with a suitable DJI charger system for the battery type.

Flights shall be conducted with a known starting battery percentage shown by the UAVsonboard system. Remote Pilots are to ensure that battery power is available for the duration of the planned flight.

When in flight, battery capacity remaining may be determined by:

- Amount used in MAH compared to capacity (if fitted with a current sensor)

- Flight time
- Indicated Battery Voltage/Onboard Battery Voltage Alert

Where no telemetry data is available, it is acceptable to operate to a known flight time only.

Where only flight time is used, a minimum battery percentage of 90% is required prior to flight.

Where other telemetry data is available, a combination of methods shall be used.

Flights should only operate to 15% of battery capacity remaining.

eg, 6S 4500 MAH 22.2v battery may use 3825MAH.

Note: Momentary fluctuations below voltage are permitted and are generally correctly ignored by the DJI M600's onboard system.

Flights that exceed any limitation must land as soon as it is safe to do so. A flight must not knowingly exceed any limitation.

Battery conditions are to be monitored by each Remote Pilot. Any defects or discrepancies shall be notified to the Maintenance Controller with the affected components company ID number.

Any battery found to not meet expectations such as:

- Failing in the onboard system test (Battery Monitoring System)
- Pre flight indications of less than 80% when fully charged
- Unexpectedly discharging more rapidly than expected (25% less flight time)
- Charging Faults
- Significant individual cell voltage differences (0.9v) during charging.
- Significant cell expansion
- Signs of visible damage not as a result of normal wear and tear

must not be used for commercial operations until the Maintenance Controller determines the battery as serviceable. External maintenance providers may be used to assist in this process in consultation with the Maintenance Controller. Disposal of an unserviceable battery must be completed in accordance with State legislation and manufactures recommendations (if any).

Section 2g – DJI Agras T30

2g.1 Pre-flight & Post-flight Check

Please read the safety guidelines before each flight.
(https://dl.djicdn.com/downloads/t30/20210611/T30_T10_Disclaimer_and_Safety_Guidelines_v1.0_9langs.pdf)

Refer to the latest DJI Agras T30 User Manual for manufacturers guidelines on flight operation.
(https://dl.djicdn.com/downloads/t30/20210727/T30_User_Manual_v1.4_EN.pdf)

Please read all checklists thoroughly. A systematic approach to ticking off all items on the checklist is required for each flight.

SITE & SAFETY		TICK
All company documentation packed	Complete	
Check for people or animals	Complete	
Briefings of personnel	Complete	
First Aid Kit identified and accessible	Identified	
Signage	Complete	
Weather conditions suitable	Checked and noted	
RPAS FIT FOR FLIGHT		
Visually inspect the airframe	Checked	
Overall condition/cracks	Checked	
Screws and fasteners secure	Checked	
Wiring	Checked	
Connectors	Checked	
Engine & mounting screws	Checked	
Arms (firmly locked and tightened)	Checked	
Propellers (unfolded)	Checked	
Camera equipment	Checked	
Transmission antennas	Checked	
Ground station (if required)	Checked	
Daily Certification	Checked	
PRE FLIGHT		
Battery mounting	Checked	
Battery (fully charged)	Checked	
RC transmitter (fully charged)	ON and Checked	

Ground station (if required) Connect battery and power up LED indicators and tones Compass calibration (when prompted) Home location Ground station Camera equipment	ON and Checked ON and Checked Checked Complete Locked Checked PRESS RECORD	
TAKE OFF		
Ensure all people in vicinity are aware of take off Increase throttle and listen for abnormalities Hover RPAS for 5 – 10 seconds @ 1 - 2 m	Announce “take off”	
POST FLIGHT (inspection)		
Disconnect battery Camera equipment Battery Overall condition/cracks Screws and fasteners Wiring Connectors Engines and mounting screws Arms Propellers Transmission antennas Complete flight log AND battery log	Checked & off Checked & Off Checked Checked Checked Checked Checked Checked Checked Checked Checked Completed	

2g.2 Maintenance Schedule

Component	Due (Calendar)	Due (time)	Added to Flight Log
Frame	On Condition	On Condition	N/A
ESC	On Condition	On Condition	N/A
Motor	On Condition	On Condition	N/A
Propeller	On Condition	On Condition	N/A
Flight Controller	On Condition	On Condition	N/A
Firmware	As per manufacturer release	N/A	N/A

Receiver	On Condition	On Condition	N/A
Transmitter	On Condition	On Condition	N/A
GNSS receiver	On Condition	On condition	N/A

2g.3 RPAS Maintenance & Operational Manual(s)

Copy of UAV Flight manual is kept in hardcopy in the office or can be obtained from the web links.

Aircraft Type	Title	Web Link
DJI AGRAS T30	User Manual	https://dl.djicdn.com/downloads/t30/20210727/T30_User_Manual_v1.4_EN.pdf
	Quick Start Guide	https://dl.djicdn.com/downloads/t30/20220630/T30_Quick_Start_Guide_v1.4_8langs.pdf
	Safety Guidelines and Disclaimer	https://dl.djicdn.com/downloads/t30/20210611/T30_T10_Disclaimer_and_Safety_Guidelines_v1.0_9langs.pdf
	T30 Intelligent Flight Battery User Guide	https://dl.djicdn.com/downloads/t30/20210929/T30_T10_Intelligent_Flight_Battery_User_Guide_v1.2_10langs.pdf
	Intelligent Flight Battery Station Use Guide	https://dl.djicdn.com/downloads/t30/20210929/T30_T10_Intelligent_Battery_Station_User_Guide_v1.2_10langs.pdf
	Firmware Update	see DJI website for latest version
	Online Tutorials	https://www.dji.com/au/t30?site=ag&from=nav

2g.4 Battery Management

DJI Agras T30 Intelligent Flight Batteries must be used in accordance with the safety guidelines provided by DJI. Safety guidelines and user manuals can be downloaded here (or see above):

https://www.dji.com/au/t30/downloads

The T30 Intelligent Flight Battery applies to DJI AGRAS T30 and has the capacity of 29,000 mAh at a nominal voltage of 51.8 V. This product must be operated with caution and expertise.

BATTERY USE

The battery should be used in the temperature range of -5° to 45° C. The battery can be used again when it returns to a normal temperature. Before operating in a low-temperature environment, make sure the battery is at least above 5°C, ideally above 20°C.

1.) Make sure the battery is fully charged before each flight. If the battery is in power saving mode, press the power button once to check the current battery level.

2.) Make sure the battery is powered off before connecting to or disconnecting from the aircraft.

3.) Press and then press and hold the power button to power on the battery after it is connected to the aircraft.

4.) When the aircraft lands and the motors stop, press and then press and hold the power button to power off the battery, and then disconnect the battery from the aircraft.

Immediately land the aircraft if a critical battery level warning appears and replace with a fully charged battery. DO NOT fly when the battery power level is below 15%.

BATTERY PRECAUTIONS

DO NOT use or leave the battery near heat sources such as a furnace or heater, and DO NOT leave the battery inside a vehicle on hot days.
DO NOT allow the battery to come into contact with any liquid. DO NOT leave the battery near a source of moisture and DO NOT use the battery in humid environments. Otherwise, the battery may corrode, potentially resulting in the battery catching fire or exploding.
DO NOT use swollen, leaking, or damaged batteries. If your battery is abnormal, contact an authorized DJI dealer for further assistance.
DO NOT use the battery in strong electrostatic or electromagnetic environments or near high-voltage transmission lines.
DO NOT disassemble or pierce a battery in any way or it may leak, catch fire, or explode.
The electrolytes in the battery are highly corrosive. If any electrolytes make contact with your skin or eyes, immediately wash the affected area with water and see a doctor immediately.
DO NOT use a battery that has been dropped. Dispose of the battery as described in the Battery Disposal section.
If the battery falls into water while inserted in an aircraft during flight, take it out immediately, and put it in a safe and open area. DO NOT use the battery again and dispose of it properly as described in the Battery Disposal section.
DO NOT put the battery in a microwave oven or a pressurized container.
DO NOT place the battery on or near wires or other metal objects such as eyeglasses, watches, jewelry, and hairpins. Otherwise, the battery ports may be short-circuited.
DO NOT drop or strike batteries, and DO NOT place heavy objects on the batteries or station. If the battery is dropped and damaged, immediately leave the battery in an open area away from people. Wait 30 minutes and soak the battery in water for 24 hours. After making sure the power has completely run out, dispose of the battery in accordance with local laws.
Always use a clean, dry cloth when cleaning the battery terminals.
Make sure the battery is correctly connected. Otherwise, the battery may overheat or even explode due to abnormal charging. Only use approved batteries from authorized dealers.
Make sure to lift the battery by the handle, and DO NOT lift it by holding the cables. Make sure the battery is placed on a flat surface.

BATTERY CHARGING GUIDELINES AND PRECAUTIONS

1.) If the battery is in power saving mode, press the power button once to check the current battery level.
2.) Make sure the battery is powered off before charging. Otherwise, the battery ports may be damaged.
3.) During charging, the LEDs blink in sequence to indicate the current battery level. Disconnect the battery when charging is complete, and always use the officially recommended charging device to charge the battery.
4.) The battery stops charging when charging is complete. It is recommended to disconnect the battery once charging is complete.

DO NOT charge the battery near flammable materials or on flammable surfaces such as carpet or wood.
DO NOT leave the battery unattended during charging. There should be a distance of at least 30 cm between the battery station and any charging batteries. Otherwise, the battery station or charging batteries may be damaged by excessive heating and may even lead to a fire hazard.
DO NOT charge the battery immediately after flight. The battery temperature may be too high and may cause serious damage to the battery. Allow the battery to cool down to close to room temperature before charging. Charge the battery at a temperature range of 0° to 60° C. The ideal charging temperature range is 22° to 28° C.
In scenarios that meet the following two conditions simultaneously, the battery can be charged immediately after flight:

a. The temperature of the flight environment was below 30° C.
b. The temperature of the charging environment is below 30° C and there is no direct sunlight.

DO NOT charge the battery near heat sources such as a furnace or heater.
Regularly check the terminals and battery ports. DO NOT clean the battery using alcohol or other inflammable liquid. DO NOT use a damaged battery station.
Always keep the battery dry.

BATTERY STORAGE

1.) Disconnect the battery from the aircraft and check if there is any build-up in the battery port.

2.) Power off and disconnect the battery from the aircraft during transportation.

3.) If the battery level is critically low, charge the battery to a power level of 40% to 60%.

DO NOT store a battery with a low power level for an extended period.
The battery must be stored in a dry environment away from heat sources, hazardous material or metal objects.
DO NOT attempt to transport a battery that is damaged or has more than 30% power. Discharge the battery to 30% or lower before transportation, and make sure the battery is placed on a flat surface.
If storing the battery for more than 3 months, it is recommended to store battery in a battery safety bag in an environment at a temperature range from -20° to 40° C.
DO NOT store the battery for an extended period after fully discharging. Doing so may over-

discharge the battery and cause irreparable damage to the battery cell.
If a battery with a low power level has been stored for an extended period, the battery will be in deep hibernation mode. Charge to wake the battery.
Disconnect the battery from the aircraft if you intend to store the battery for an extended period. Fully charge and discharge the battery at least once every three months to ensure the performance of the battery.

BATTERY DISPOSAL

Before disposing, make sure to soak the battery in water for 24 hours to completely discharge the battery. Dispose of the battery in specific recycling boxes.

DO NOT place the battery in regular waste containers.

Strictly follow your local regulations regarding the disposal and recycling of batteries. If the battery cannot be discharged completely, DO NOT dispose of the battery in a battery recycling box directly.

GENERAL BATTERY MANAGEMENT

Each individual battery must be numbered, and all flight time logged as part of the RPAS flight log procedure.

The Intelligent T30 Battery has the below functions:

Communication: Battery parameters including the voltage and power level are transmitted to the aircraft to enable the aircraft to take appropriate action when battery parameters change.
Charging Error Detection: Errors that occur during charging are indicated by the status LEDs. When an error occurs, disconnect the battery and wait for the battery to fix the error automatically.
Battery Error Records: The battery records errors such as excessive charging or discharging, exceeding the temperature range when charging and discharging, and storing a battery for an extended period with the power level outside of the recommended range.
Auto Balancing: In certain situations, the battery automatically balances the voltages of the cells.
Auto Discharging: If fully charged for more than one day, the battery automatically discharges to 97%. After 7 days, it automatically discharges to 60%.
Auto Current Adjustment: When using with the provided battery station, the battery intelligently adjusts the charging current based on the temperature of the battery cell. The battery also supports self-protection based on environment temperature.
Temperature Control: The battery ensures the temperature difference between the battery cells are the same and stay within the allowable temperature range.

Battery conditions are to be monitored by each Remote Pilot. Any defects or discrepancies shall be notified to the Maintenance Controller with the affected components company ID number.

Any battery found to not meet expectations such as:

- Charging to a significantly less than rated capacity amount (20% less)
- Pre-flight indications of less than 80% when fully charged
- Unexpectedly discharging more rapidly than expected (25% less flight time)

- Charging Faults
- Significant individual cell voltage differences (0.9v) during balanced charging.
- Significant cell expansion
- Signs of visible damage not as a result of normal wear and tear

must not be used for commercial operations until the Maintenance Controller determines the battery as serviceable. External maintenance providers may be used to assist in this process in consultation with the Maintenance Controller. Disposal of an unserviceable battery must be completed in accordance with State legislation and manufactures recommendations (if any).

T30 INTELLIGENCE FLIGHT BATTERY (BAX501-29000MAH-51.8V) SPECIFICATIONS

Nominal Voltage: 51.8 V
Battery Type: Lithium Battery 14S
Discharge Rate: 11.5 C
Operating Temperate Range: -5°C to 45°C
Charging Temperate Range: 0°C to 60°C
Compatible Charging Device: T30 Intelligent Battery Station or D9000i Multifunction Inverter Generator
Capacity: 29000 mAh
Energy: 1502 Wh
Battery Charging Time*: 9-12 mins when the battery station is connected with two AC power cables; 18-25 mins when the battery station is connected with one AC power cable.
Max Charging Power: 7200 W
Weight: 10.2 kg

Section 2h – DJI Mavic 2 PRO

2h.1 Pre-flight & Post-flight Check

Refer to the latest DJI Mavi 2 PRO User Manual. (https://dl.djicdn.com/downloads/Mavic_2/20180827/Mavic%202%20Pro%20Zoom%20User%20Manual_v1.0.pdf)

Mavic 2 PRO CHECKLIST : RPAS Reg. No. _____						Mission name:	
Mission Checklist							
☐	Airport(s) Notified:	☐	UAV Batteries Charged			☐	Gimbal Protector Installed
☐	Location is OK to fly		Battery 1 level:			☐	Propellers Packed
☐	Weather Forecast OK		Battery 2 level:			☐	Cables Packed
	Temperature:		Battery 3 level:			☐	Camera Filters Packed
	Wind:		Battery 4 level:			☐	Sun Shade Packed
	Precipitation:		☐	Controller Charged		☐	Tools Packed
☐	Firmware up-to-date	☐	Tablet Charged			☐	Flight Plan designed/entered in software
☐	MicroSD Card Formatted	☐	Mobile Phone Charged			☐	Log Book Packed
Launch Site Checklist							
☐	Verify Weather is OK to Fly			☐	Check for obstacles, interference		
	Temperature:			☐	Check for nearby human activity/dangerous situations		
	Wind:			☐	Verify Launch Pad is down-wind from observers		
	Precipitation:			☐	Launch Pad/Barriers Placed Signage in position as per JSA		
☐	**Safety Briefing**						
Equipment Checklist							
☐	Airframe/Landing gear inspected	☐	SD Card Installed			☐	Gimbal/Lens Protector Removed
☐	Propellers Inspected/Attached	☐	Battery Installed			☐	Camera Filters Installed
☐	Controller/Tablet Assembled						

Pre-Flight Checklist			
☐	Aircraft Placed on Launch Pad	☐	Check RC battery level
☐	Turn on Remote Controller	☐	Check Aircraft Battery Level
☐	Antennas Properly Positioned	☐	Check flight mode switch (P-Mode)
☐	Turn on Aircraft	☐	Check Satellite and Compass status
☐	Check the aircraft status LEDs	☐	Set RTH Location and height
☐	Verify the gimbal is level, can move unobstructed	☐	Check camera settings
☐	Turn on radio (if required) and check frequency is correct as per JSA. Volume up.		

Take-Off Checklist			
☐	Check launch site is clear for take off	☐	Make sure the aircraft is stable while hovering
☐	Start the motors. Announce "TAKE OFF"	☐	Check flight controls, make sure they respond as expected
☐	Take off and hover	☐	Start recording video

Post Flight Checklist					
☐	Remove Battery from Aircraft & off	☐	Install Gimbal Guard	☐	Repack all equipment
	Condition of components checked: ☐ Camera (checked & off) ☐ Overall condition of frame (cracks, moisture, dust) ☐ Screws & fasteners; wiring ☐ Propellers				
☐	**Complete the Flight Log**				

2h.2 Maintenance Schedule

Pre and post flight inspections are undertaken so that any minor or major defect can be identified and rectified. Any sign of damage that may inhibit the operation of the RPAS should result in replacement of the component/s.

Component	Due (Calendar)	Due (time)	Added to Flight Log
Frame	On Condition	On Condition	N/A
ESC	On Condition	On Condition	N/A
Motor	On Condition	On Condition	N/A

Propeller	On Condition	On Condition	N/A
Flight Controller	On Condition	On Condition	N/A
Firmware	As per manufacturer release	N/A	N/A
Receiver	On Condition	On Condition	N/A
Transmitter	On Condition	On Condition	N/A
GNSS receiver	On Condition	On condition	N/A

2h.3 RPAS Maintenance & Operational Manual(s)

Copy of UAV Flight manual is kept in hardcopy in the office or can be also obtained from the web links.

Aircraft type	Title	Web link
MAVIC 2 PRO	User manual	https://dl.djicdn.com/downloads/Mavic_2/20180827/Mavic%202%20Pro%20Zoom%20User%20Manual_v1.0.pdf
	Quick Start Guide	https://dl.djicdn.com/downloads/Mavic_2/20180823/Mavic_2_Pro_Quick_Start_Guide_EN.pdf
	Firmware update	see DJI website for latest version
	Online tutorials	https://www.dji.com/mavic-2/info

2h.4 Battery Management

MAVIC 2 PRO smart batteries must be used in accordance with the safety guidelines provided by DJI. A hard copy of the DJI smart flight battery safety guidelines is available from the Chief Remote Pilot. Safety guidelines can be downloaded here:

https://dl.djicdn.com/downloads/Mavic_2/20180823/Mavic_2_Intelligent_Flight_Battery_Safety_Guidelines_EN.pdf

Each individual battery must be numbered and all flight time logged as part of the RPAS flight log procedure. Charge cycles must be balanced after the last flight of the day or prior to the first flight of the day. All other charges are not required to be balanced.

Where possible, battery systems should not be stored in a fully charged state for periods of more than 1 week.

Flights should commence only with fully charged batteries.

All batteries must be charged with a suitable charging system in accordance with that chargers instructions.

Flights shall be conducted with a known starting battery percentage shown by an independent testing system that is not a part of the UAVs onboard system. Controllers are to ensure that battery power is available for the duration of the planned flight.

When in flight, battery capacity remaining may be determined by:

- Amount used in MAH compared to capacity (if fitted with a current sensor)
- Flight time
- Indicated Battery Voltage/Onboard Battery Voltage Alert

Where no telemetry data is available, it is acceptable to operate to a known flight time only.

Where only flight time is used, a minimum battery percentage of 90% is required prior to flight.

Where other telemetry data is available, a combination of methods shall be used.

Flights should only operate to 85% of battery capacity remaining.

eg, 4S 3850 MAH 15.4v battery may use 3080 MAH.

Note: Momentary fluctuations below voltage are permitted under high load situations such as a maximum rate climb; this may cause a Battery Voltage Alert system to momentarily activate.

Flights that exceed any limitation must land as soon as it is safe to do so. A flight must not knowingly exceed any limitation.

Computer based logging of all battery data is recommended via systems approved by the Maintenance Controller.

Battery conditions are to be monitored by each Remote Pilot. Any defects or discrepancies shall be notified to the Maintenance Controller with the affected components company ID number.

Any battery found to not meet expectations such as:

- Charging to a significantly less than rated capacity amount (20% less)
- Pre flight indications of less than 80% when fully charged
- Unexpectedly discharging more rapidly than expected (25% less flight time)
- Charging Faults
- Significant individual cell voltage differences (0.9v) during balanced charging.
- Significant cell expansion
- Signs of visible damage not as a result of normal wear and tear

must not be used for commercial operations until the Maintenance Controller determines the battery as serviceable. External maintenance providers may be used to assist in this process in consultation with the Maintenance Controller. Disposal of an unserviceable battery must be completed in accordance with State legislation and manufactures recommendations (if any).

Section 2i – Mavic Mini 2

2i.1 Pre-flight & Post-flight Check

Refer to the latest DJI Mavic Mini 2 User Manual.
(https://dl.djicdn.com/downloads/DJI_Mini_2/20210630/DJI_Mini_2_User_Manual-EN.pdf)

Mavic Mini 2 CHECKLIST : RPAS Reg. No._____					Mission name:	
Mission Checklist						
☐	Airport(s) Notified:	☐	UAV Batteries Charged		☐	Gimbal Protector Installed
☐	Location is OK to fly		Battery 1 level:		☐	Propellers Packed
☐	Weather Forecast OK		Battery 2 level:		☐	Cables Packed
	Temperature:		Battery 3 level:		☐	Camera Filters Packed
	Wind:		Battery 4 level:		☐	Sun Shade Packed
	Precipitation:	☐	Controller Charged		☐	Tools Packed
☐	Firmware up-to-date	☐	Tablet Charged		☐	Flight Plan designed/entered in software
☐	MicroSD Card Formatted	☐	Mobile Phone Charged		☐	Log Book Packed
Launch Site Checklist						
☐	Verify Weather is OK to Fly			☐	Check for obstacles, interference	
	Temperature:			☐	Check for nearby human activity/dangerous situations	
	Wind:			☐	Verify Launch Pad is down-wind from observers	
	Precipitation:			☐	Launch Pad/Barriers Placed Signage in position as per JSA	
☐	**Safety Briefing**					
Equipment Checklist						
☐	Airframe/Landing gear inspected	☐	SD Card Installed	☐	Gimbal/Lens Protector Removed	
☐	Propellers Inspected/Attached	☐	Battery Installed	☐	Camera Filters Installed	
☐	Controller/Tablet Assembled					
Pre-Flight Checklist						
☐	Aircraft Placed on Launch Pad			☐	Check RC battery level	
☐	Turn on Remote Controller			☐	Check Aircraft Battery Level	
☐	Antennas Properly Positioned			☐	Check flight mode switch (P-Mode)	
☐	Turn on Aircraft			☐	Check Satellite and Compass status	

☐	Check the aircraft status LEDs	☐	Set RTH Location and height
☐	Verify the gimbal is level, can move unobstructed	☐	Check camera settings
☐	Turn on radio (if required) and check frequency is correct as per JSA. Volume up.		

Take-Off Checklist					
☐	Check launch site is clear for take off	☐	Make sure the aircraft is stable while hovering		
☐	Start the motors. Announce "TAKE OFF"	☐	Check flight controls, make sure they respond as expected		
☐	Take off and hover	☐	Start recording video		
Post Flight Checklist					
☐	Remove Battery from Aircraft & off	☐	Install Gimbal Guard	☐	Repack all equipment
	Condition of components checked: ☐ Camera (checked & off) ☐ Overall condition of frame (cracks, moisture, dust) ☐ Screws & fasteners; wiring ☐ Propellers				
☐	**Complete the Flight Log**				

2i.2 Maintenance Schedule

Pre and post flight inspections are undertaken so that any minor or major defect can be identified and rectified. Any sign of damage that may inhibit the operation of the RPAS should result in replacement of the component/s.

Component	Due (Calendar)	Due (time)	Added to Flight Log
Frame	On Condition	On Condition	N/A
ESC	On Condition	On Condition	N/A
Motor	On Condition	On Condition	N/A
Propeller	On Condition	On Condition	N/A
Flight Controller	On Condition	On Condition	N/A
Firmware	As per manufacturer release	N/A	N/A
Receiver	On Condition	On Condition	N/A
Transmitter	On Condition	On Condition	N/A
GNSS receiver	On Condition	On condition	N/A

2i.3 RPAS Maintenance & Operational Manual(s)

Copy of UAV Flight manual is kept in hardcopy in the office or can be also obtained from the web links.

Aircraft type	Title	Web link
Mavic Mini 2	User Manual	https://dl.djicdn.com/downloads/DJI_Mini_2/20210630/DJI_Mini_2_User_Manual-EN.pdf
	Quick Start Guide	https://dl.djicdn.com/downloads/DJI_Mini_2/20210129/DJI_Mini_2_Quick_Start_Guide.pdf
	Firmware Update	see DJI website for latest version
	Online Tutorials	http://www.dji.com/mini-2/video

2i.4 Battery Management

Mavic Mini 2 Intelligent Flight Batteries must be used in accordance with the safety guidelines provided by DJI. A hard copy of the DJI Intelligent Flight Batteries safety guidelines is available from the Chief Remote Pilot. Safety guidelines can be downloaded here:

https://dl.djicdn.com/downloads/DJI_Mini_2/DJI_Mini_2_Disclaimer_and_Safety_Guidelines_12.pdf

BATTERY USE

1.) Check the battery level. Press the power button once to check the battery level. Always ensure that the batteries are fully charged before each flight.

2.) Powering On/Off: Press the power button once, then press again, and hold for two seconds to power the battery on or off. The battery level LEDs display the battery level when the aircraft is powered on.

CHARGING THE BATTERY

Fully charge the Intelligent Flight Battery before using for the first time.

1.) Connect the USB charger to an AC power supply (100-240V, 50/60 Hz). Use a power adapter if necessary.
2.) Attach the aircraft to the USB charger.
3.) The battery level LEDs display the current battery level during charging.
4.) The Intelligent Flight Battery is fully charged when all the battery level LEDs are on. Detach the USB charger when the battery is fully charged.

GENERAL BATTERY MANAGEMENT

The DJI Mavic Mini 2 Intelligent Flight Battery has the below functions:

Balanced Charging: during charging, the voltages of the battery cells are automatically balanced.
Auto-Discharging Function: to prevent swelling, the battery automatically discharges to approx. 96% of the battery level when it is idle for one day, and automatically discharges to approx. 72% of the battery level when it is idle for nine days. It is normal to feel moderate heat being emitted from the battery during the discharging process.
Overcharge Protection: the battery stops charging automatically once fully charged.
Temperature Detection: To prevent damage, the battery only charges when the temperature is between 5° and 40° C (41° and 104° F). Charging stops automatically if the temperature of the battery exceeds 50° C (122° F) during the charging process.
Overcurrent Protection: the battery stops charging if an excess current is detected.
Over-discharge Protection: discharging stops automatically to prevent excess discharge when the battery is not in flight use. Over-discharge protection is not enabled when the battery is in flight use.
Short Circuit Protection: the power supply is automatically cut if a short circuit is detected.
Battery Cell Damage Protection: DJI Fly displays a warning prompt when a damaged battery cell is detected.
Hibernation Mode: if the battery cell voltage is lower than 3.0 V or the battery level is less than 10%, the battery enters Hibernation mode to prevent over-discharge. Charge the battery to wake it from hibernation.
Communication: information about the voltage, capacity, and current of the battery is transmitted to the aircraft.

Each individual battery must be numbered, and all flight time logged as part of the RPAS flight log procedure.

Flights should commence only with fully charged batteries.

All batteries must be charged with a suitable charging system in accordance with the instructions.

Flights shall be conducted with a known starting battery percentage shown by an independent testing system that is not a part of the UAVs onboard system. Controllers are to ensure that battery power is available for the duration of the planned flight.

When in flight, battery capacity remaining may be determined by:

- Amount used in mAh compared to capacity (if fitted with a current sensor)
- Flight time
- Indicated Battery Voltage/Onboard Battery Voltage Alert

Where no telemetry data is available, it is acceptable to operate to a known flight time only.
Where only flight time is used, a minimum battery percentage of 90% is required prior to flight.

Where other telemetry data is available, a combination of methods shall be used.

Flights should only operate to 85% of battery capacity remaining.

Flights that exceed any limitation must land as soon as it is safe to do so. A flight must not knowingly exceed any limitation.

Computer based logging of all battery data is recommended via systems approved by the Maintenance Controller.

Battery conditions are to be monitored by each Remote Pilot. Any defects or discrepancies shall be notified to the Maintenance Controller with the affected components company ID number.

Any battery found to not meet expectations such as:

- Charging to a significantly less than rated capacity amount (20% less)
- Pre flight indications of less than 80% when fully charged
- Unexpectedly discharging more rapidly than expected (25% less flight time)
- Charging Faults
- Significant individual cell voltage differences (0.9v) during balanced charging.
- Significant cell expansion
- Signs of visible damage not as a result of normal wear and tear

must not be used for commercial operations until the Maintenance Controller determines the battery as serviceable. External maintenance providers may be used to assist in this process in consultation with the Maintenance Controller. Disposal of an unserviceable battery must be completed in accordance with State legislation and manufactures recommendations (if any).

MAVIC MINI 2 INTELLIGENCE FLIGHT BATTERY SPECIFICATIONS

Nominal Voltage: 7.7V
Operating Temperate Range: 0°C to 40°C
Capacity: 2250 mAh

Section 2j – HexH20

2j.1 Pre-flight & Post-flight Check

The HexH20 is a waterproof drone manufactured by XtremeVision360 Limited ('we', 'us' and 'our'). The company is registered in England and Wales under company number 08311242 and the registered address is XtremeVision360 Ltd, Martlet House, E1 Yeoman Gate, Yeoman Way, Worthing, West Sussex, BN13 3QZ. Our VAT number is 151 5700 37.

The Hexh20 RPAS is constructed with bespoke moulded bodies and DJI operating components and GoPro gimbal. As such, RPAS Remote Pilots are instructed to follow operating instructions made available at the following link:

https://www.quadh2o.com/hexh2o/hexh2o-ready-to-fly/?tab=downloads

HexH20 Reg No. _____				**Mission name:**	
Mission Checklist					
☐	Airport(s) Notified:	☐	UAV Batteries Charged	☐	Gimbal Protector Installed
☐	Location is OK to fly		Battery 1 volts:	☐	Propellers Packed
☐	Weather Forecast OK		Battery 2 volts:	☐	Cables Packed
	Temperature:		Battery 3 volts:	☐	Camera Filters Packed
	Wind:		Battery 4 volts:	☐	Sun Shade Packed
	Precipitation:	☐	Controller Charged	☐	Tools Packed
☐	Firmware up-to-date	☐	Tablet Charged	☐	Flight Plan designed/entered in software
☐	MicroSD Card Formatted	☐	Mobile Phone Charged	☐	Log Book Packed

Launch Site Checklist			
☐	Verify Weather is OK to Fly	☐	Check for obstacles, interference
	Temperature:	☐	Check for nearby human activity/dangerous situations
	Wind:	☐	Verify Launch Pad is down-wind from observers
	Precipitation:	☐	Launch Pad/Barriers Placed
☐	**Safety Briefing**		

Equipment Checklist					
☐	Airframe/Landing gear inspected	☐	SD Card Installed	☐	Gimbal/Lens Protector Removed
☐	Propellers Inspected/Attached	☐	Battery Installed	☐	Camera Filters Installed
☐	Controller/Tablet Assembled				

Pre-Flight Checklist			
☐	Aircraft Placed on Launch Pad	☐	Check RC battery level
☐	Turn on Remote Controller	☐	Check Aircraft Battery Level
☐	Antennas Properly Positioned	☐	Check flight mode switch (P-Mode)
☐	Turn on Aircraft	☐	Check Satellite and Compass status
☐	Check the aircraft status LEDs	☐	Set RTH Location and height
☐	Verify the gimbal is level, can move unobstructed	☐	Check camera settings

Take-Off Checklist			
☐	Check launch site is clear for take off	☐	Make sure the aircraft is stable while hovering
☐	Start the motors	☐	Check flight controls, make sure they respond as expected
☐	Take off and hover	☐	Start recording video

Post Flight Checklist					
☐	Remove Battery from Aircraft	☐	Install Gimbal Guard	☐	Repack all equipment
☐	**Complete the Flight Log**				

2j.2 Maintenance Schedule

Component	Due (Calendar)	Due (time)	Added to Flight Log
Frame	On Condition	On Condition	N/A
ESC	On Condition	On Condition	N/A
Motor	On Condition	On Condition	N/A
Propeller	On Condition	On Condition	N/A
Flight Controller	On Condition	On Condition	N/A
Firmware	As per manufacturer release	N/A	N/A
Receiver	On Condition	On Condition	N/A

Transmitter	On Condition	On Condition	N/A
GNSS receiver	On Condition	On condition	N/A

2j.3 RPAS Maintenance & Operational Manual(s)

Copy of UAV Flight manual is kept in hardcopy in the office or can be also obtained from the web links.

Aircraft type	Title	Web link
HexH20	Before flying manual	https://www.quadh2o.com/resources/receiving-rtf-hexh2o-kit/
	Building Guide	https://www.quadh2o.com/resources/hexh2o-build-guide-v1/
	Website	https://www.quadh2o.com/hexh2o/hexh2o-kit/
	T10J Transmitter	http://manuals.hobbico.com/fut/10j-manual.pdf

2j.4 Battery Management

HexH20 run with 6S 22.2V 7000mAh LiPO Tattu battery batteries which provide high quality, reliable power for the Multirotor.

When charging LiPo Tattu batties, only use a charger designed for lithium polymer/Lion battery (*such as the SKYRC D100 AC/DC Dual Balance Charger/Discharger*). Do not use a NIMH/ NICD/ LIFEPO4/ LEAD ACID charger.

When using the SKYRC D100 or similar charger, be absolutely sure to select the **Lithium polymer (Lipo) mode**. Failure to do so may cause a fire, which may result in personal injury and property damage.

User should always charge batteries in an open area away from flammable materials, liquids and surfaces.

Never charge batteries below freezing (0°C, 32°F)

Never charge batteries that are hot to the touch (above 100° F). DO NOT handle batteries until they are cool.

User should always set the charger to the proper cell count and/or voltage listed on Batteries' labels.

User should always set the charger to the amp charge rate as listed on Batteries' labels.

The charger should never be set to charge Batteries at a rate greater than 1C (One (1) times the capacity of Batteries in amp hours) unless another C rate is specified in the manufacturer's product documentation or the rate is preset as part of a specific battery and charger combination. DO NOT alter the charge rate once charging has begun.

Tattu LiPos are manufactured for a 150 use life. Each individual battery must be numbered and all flight time logged as part of the RPAS flight log procedure. Charge cycles must be balanced after the last flight of the day or prior to the first flight of the day. All other charges are not required to be balanced.

Where possible, battery systems should not be stored in a fully charged state for periods of more than 1 week.

Flights should commence only with fully charged batteries.

Flights shall be conducted with a known starting battery percentage shown by an independent testing system that is not a part of the UAVs onboard system. Controllers are to ensure that battery power is available for the duration of the planned flight.

When in flight, battery capacity remaining may be determined by:

- Amount used in MAH compared to capacity (if fitted with a current sensor)
- Flight time
- Indicated Battery Voltage/Onboard Battery Voltage Alert

Where no telemetry data is available, it is acceptable to operate to a known flight time only.

Where only flight time is used, a minimum battery percentage of 90% is required prior to flight.

Where other telemetry data is available, a combination of methods shall be used.

Flights should only operate to 85% of battery capacity remaining.

eg, 3S 5200 MAH 11.1v battery may use 4420 MAH.

Note: Momentary fluctuations below voltage are permitted under high load situations such as a maximum rate climb; this may cause a Battery Voltage Alert system to momentarily activate.

Flights that exceed any limitation must land as soon as it is safe to do so. A flight must not knowingly exceed any limitation.

Computer based logging of all battery data is recommended via systems approved by the Maintenance Controller.

Battery conditions are to be monitored by each Remote Pilot. Any defects or discrepancies shall be notified to the Maintenance Controller with the affected components company ID number.

Any battery found to not meet expectations such as:

- Charging to a significantly less than rated capacity amount (20% less)
- Pre flight indications of less than 80% when fully charged
- Unexpectedly discharging more rapidly than expected (25% less flight time)
- Charging Faults
- Significant individual cell voltage differences (0.9v) during balanced charging.
- Significant cell expansion
- Signs of visible damage not as a result of normal wear and tear.

must not be used for commercial operations until the Maintenance Controller determines the battery as serviceable. External maintenance providers may be used to assist in this process in

consultation with the Maintenance Controller. Disposal of an unserviceable battery must be completed in accordance with State legislation and manufactures recommendations (if any).

Specifications of Tattu LiPo 6S 22.2V 7000mAh batteries are as follows:

Capacity: 7000mAh
Voltage: 22.2V
Max Continuous Discharge: 25C
Max Burst Discharge: 50C
Weight: 875g
Dimensions: 136*42*68 mm
Balance Plug: JST-XH
Discharge Plug: EC5
Charge Rate: 1-3C Recommended, 5C Max

Section 2k– Quaternium Hybrix 2.1

2k.1 Pre-flight & Post-flight Check

Refer to the latest Quaternium Hybrix 2.1 user manual (available for download on the RPAS black board site.

QUATERNIUM TECHNOLOGIES S.L.	FLIGHT CHECKLIST	Quaternium

DATE: OP. RESPONSIBLE:

NECESSARY MATERIAL

ITEM	CHECKED
1. Checklists (pre-flight & post-flight)	
2. Aircraft body with charged batteries (49V) & data-link components	
3. Canopy	
4. Aircraft arms with propellers	
5. GCS (Ground Control Station) with its battery charged	
6. Spare parts if necessary	
7. Extra batteries for GCS if necessary	
8. Tablet or PC with battery charged for Telemetry	
9. Recharging fuel station	
10. ToolBox with all tools required	

MINIMUM TOOL LIST (MTL)

1. Hex Wrenches: (1.5mm and 2mm and 2.5mm and 3mm and 4,5mm)	
2. Zip ties	
3. Plain Screwdriver	
4. 2x Fixed Wrenches M8	
5. Phillips screwdriver (PH1, PH2 & PH0)	
6. Calibrated dynamometric wrench 0-10 N/m	

SECURITY EQUIPMENT AND DOCUMENTATION

1. Fire extinguisher	
2. Protection gloves and glasses	
3. First aid kit	
4. Noise protection headphones	
5. Sunglasses	
6. Legal documents appropriate to local regulations (insurance, certif...)	
7. Flight register documents	

SYSTEM ASSEMBLY

ITEMS	COMPROBADO
1. Place the body of the aircraft in a leveled surface	
2. Connect and tighten the screws of the the landing gear	
3. Connect and place the arms (short ones are the front arms)	
4. Tighten each arm screw	
5. Check that the propeller screws are not loose	
6. Check that the rotor screws are not loose	
7. Check that the exhaust screws and nuts are not loose	
8. Visually inspect that all connectors and electronics are OK	
9. Check that the battery voltage is 49V or higher	
10. Check that there is enough fuel for the operation in the tank	
11. Check that the GCS battery is 100%	
12. Check that the tablet or PC battery is 100%	
13. Check Engine power led on the PDB works fine (Kill Switch)	
14. Check fuel pump works when you turn on the EFI	

PRE-FLIGHT - POWER UP

ITEMS	OK
1. Turn on GCS	
2. Connect the main power connector	
3. Lock the main power connector	
4. Connect telemetry viewer system (tablet or PC)	
5. Link the aircraft to the telemetry viewer system	
6. Verify all functionalities are working (flight modes, RTL switch, 3D Fix)	
7. Start the range extender	
8. Push the safety-switch button	
9. Verify that the flight area is clear	
10. Arm the drone and operate it under safe conditions	

POST-FLIGHT & DISASSEMBLY

ITEMS	OK
1. Disarm the drone when it is landed	
2. Push safety-switch button until you hear the motor beep	
3. Disconnect the main power connector	
4. Turn off the GCS and the telemetry system	
5. Drain the remanent fuel if the aircraft is going to be stored	
6. Disassembly the arms	
7. Check that all components seem ok	
8. Store all components in a safe place	

PILOT PERFORMANCE

1. HYBRiX pilot must have deep expertise operating drones, flying them in both manual and assisted modes
2. The pilot must know all the functions of the HYBRiX GCS and how the drone behaves in every situation
3. HYBRiX pilot must have a valid UAV pilot license for the country where the drone is going to be operated
4. The operator and pilot must have appropriate liability insurance
5. The pilot must be familiar with the emergency procedures: RTL, failsafe, killswitch...
6. HYBRiX pilot must be aware of the safety measures and risks: Safety distance, disarm beep, fire extinguisher

2k.2 Maintenance Schedule

Pre and post flight inspections are undertaken so that any minor or major defect can be identified and rectified. Any sign of damage that may inhibit the operation of the RPAS should result in replacement of the components.

Further the maintenance schedule will follow the manufacturer recommendations in the user manual.

DAILY MAINTENANCE

Pre-flight checks

Before starting any operation you must carry out the relevant pre-flight checks and fill in the Annex Pre-flight checklist before the flight. It can be done in parallel to the aircraft preparation for the flight. This procedure is designed to anticipate possible failures that may occur during flight and to prevent hazard situations. It must be performed before each flight by the pilot-in-command or authorized technician.

Post flight review and checks

After completing the operation, you must carry out the checks specified in the Annex Post-flight checklist to confirm that no incidents have occurred during the flight and that the aircraft can be stored safely.

SERVICE MAINTENANCE (each 25 hours of flight)

The pilot or accredited technician must carry out maintenance of service and complete the maintenance register book, made from copies of the Annex maintenance sheet that is supplied. At this step an exhaustive check of all components of the system must be carried out and adjusted or replaced if necessary. A summary is listed below:

Propulsion system

1) Visual check of propeller fixing and tightening of retaining screws.
2) Visual inspection of the correct alignment of the rotors.
3) Manual check of the correct state of rotor bearings.

Power system

1) Visual check of the correct condition of the battery and its connectors: no rust, swelling or damage.
2) Balancing of the battery cells according to section 4.4 of this manual.
3) Checking the combustion engine (see attached Zenoah manual for extended information):
    a) Check / Spark Plug Adjustment (GAP)

Fuselage

1) Comprehensive visual inspection of the fuselage, fuel tank, landing gear and other components to detect cracks, wear, impacts or other damage.
2) Manual check of the condition and elasticity of the dumpers.
3) Visual check of correct screw tightening.

Communication system

Inspection of the condition of the antennas and their fixings.

Navigation system

1) Inspection of the status of the flight controller and GPS.

Ground station

1) Visual inspection of the status of the ground station components.
2) Visual inspection of the absence of damages in the batteries of the ground station and their correct level of load.

Fuel station

1) Visual inspection of the status of the components of the fuel station and its battery. Check for absence of cracks or leaks of fuel.

GENERAL MAINTENANCE (each 12 months or 240 hours of flight)

The accredited technician or the staff of the manufacturing company must carry out the general maintenance and fill in the maintenance record book every 100 hours of flight, drawn from copies of the maintenance sheet supplied. Alternatively, the manufacturer may train a technician of the client to perform the 100 flight-hour maintenance, and take the system back for overhaul at 200 or 500 hr.

Propulsion system

1) Thorough inspection of the propellers and replacement in case of damage.
2) Disassembly of the rotors and inspection of bearing status. Replacement in case of wearing.

Power system

1.) Checking the combustion engine (see Zenoah manual for extended information):

a. Idle review.

b. Clean air filter.

c. Check / Spark Plug Adjustment (GAP).

d. Revision and replacement of piston and segments if applicable.

e. Check and replacement cylinder if applicable.

f. Check and replacement of spark plug if applicable.

Fuselage

1) Thorough inspection of the fuselage, landing gear and other components to detect cracks, wear, impacts or other damage. Replacement of any component with wearing signs.

Electronics

1) Comprehensive visual inspection of all electrical wiring and system connectors, and replacement in case of malfunctions.
2) Comprehensive check of electronic boards and working voltages on the main board.
3) Checking of availability of a stable firmware upgrade for the governor on Quaternium site.

Navigation system

1) Checking of availability of a stable firmware upgrade for the Flight Controller on Quaternium

site.

Software maintenance and update

When the system is received, the software and firmware of the different components is updated to the latest stable version and correctly configured for its proper operation. Periodically, you will receive a notification from the manufacturer with the instructions to update to the latest authorised software or firmware version.

To ensure that the RPAS works correctly, you should NOT modify any configuration parameters without first consulting the manufacturer.

2k.3 RPAS Maintenance & Operational Manual(s)

Copy of UAV Flight manual is kept in hardcopy in the office or can be also obtained from the SCU RPAS Blackboard site.

Aircraft type	Title	Web location
Quaternium Hybrix 2.1	User manual	SCU RPAS Blackboard site

2k.4 Fuel system and Battery Management

FUEL MIX

Before going to the airfield, remember to prepare the fuel mix that you will need for the planned operation. HYBRiX 2.1 aircraft operates on a mixture of 95 octane gasoline and 2-stroke engine synthetic oil at 4% volume . Quaternium recommends using HP Super 2-stroke engine oil from STIHL.

It is essential to make the mixture in the appropriate proportion, with the aid of a measurer, for a correct operation and conservation of the apparatus.

Example:

10 liters of gasoline + 400 milliliters of oil

If the mixed fuel is not fully consumed during the operation, it can be returned to the fuel station and reused another day. The fuel should be stored at a safe place in its appropriate container. Under normal circumstances the mix will be usable after more than one month of storage, but always confirm that the aspect of the mix and its density is correct before using it, if it has been stored for a while. If you must discard the fuel, please make it in an appropriate and safe way.

FUEL CHARGE

Use the fuel station included in the system to fill the tank of the aircraft to the desired volume. To do this, follow the steps below:

1) Identify the fuel quick connectors and, both in the aircraft and the fuel station.

2) Disconnect the connectors from the fuel station and the aircraft, opening the circuit for fuel and air.

3) Make sure that the connector flap is in the correct position and connect both connectors of the fuel station to their complementary ones on the aircraft.

4) Loosen the lid of the fuel station to reduce inside pressure.

5) Activate the filling pump to the desired load level by moving the fuel station switch to the "FILL" position. When finished, place the switch in its middle position and disconnect the fuel station. When the tank is full, the fuel excess will be released through the fuel tube that goes inside the landing gear.

6) Finally, close the circuit by attaching the two connectors of the aircraft to each other. Repeat the process with the fuel station connectors and close the fuel station lid.

FUEL DRAIN

Use the recharging station to empty the tank of the aircraft:

1) Identify the fuel side tube and its connector.

2) Connect the tubes of the aircraft to those of the refueling station, following the same procedure as in above for fuel loading.

3) Move the switch of the fuel station up to its "DRAIN" position until the discharge is complete and no more fuel flows through the tube.

4) Move switch to its center position, turning off the charging station.

5) Disconnect both fuel tubes and connect the aircraft jacks to each other.

6) Finally connect the jacks of the recharging station to each other and check that no element loses fuel.

REFUEL

In order to perform another flight after consuming the fuel in the tank, proceed to disconnect and power off the system once on the ground, according to the instructions in section 4.7, wait for 5 minutes for the aircraft to cool down, and then proceed to load the tank, by following the steps corresponding to the fuel load.

BATTERY CHARGE SAFETY GUIDELINES

HYBRiX 2.1 aircraft, ground station and fuel station use batteries. Please read the following guidelines carefully to prevent them from malfunctioning and avoid unnecessary risks:

1) Use only chargers specific for each type of batteries. Failure to do so could damage the battery and charger and may cause FIRE, resulting in personal injury and / or property damage.

2) Do not leave batteries unattended at any time while being charged or discharged. You should always overview the charging process to be able to react to any problem that might occur. Always provide adequate ventilation around batteries during charge, discharge, while in use and during storage.

3) Always charge batteries in a fireproof location. Do not charge or discharge batteries on carpet, near paper, plastic, vinyl or wood or inside a vehicle.

4) Empty HYBRiX aircraft fuel tank before charging or discharging its batteries.

5) Do not attempt to disassemble any battery packs or cells.

6) Do not allow cells to overheat at any time. Cells which reach greater than 60ºC should be placed in a fireproof location. It is normal for the batteries to become warm during charging, but if the charger or battery becomes excessively hot disconnect the battery from the charger immediately. Always inspect a battery which has previously overheated for potential damage and do not re-use if you suspect it has been damaged in any way.

7) Never store your batteries in a vehicle or in any place where high temperatures can be reached. Extreme temperatures can cause the battery to burn.

8) If at any time you notice that a battery swells or spills liquid, disconnect it immediately and observe it for 15 minutes from a safe place. This could cause ignition of the battery due to the chemical components it contains along with outside air. The place to monitor this must be a safe area outside any building and away from any combustible material.

9) Do not allow battery cells to come in contact with moisture or water at any time.

10) Be careful to NEVER connect both terminals of the battery to each other, this short circuit could cause fire. Additionally, be very careful not to cause a short circuit by connecting the terminals wearing rings or wristbands when handling them, as the terminals can cause serious injuries in touch with metallic surfaces.

11) A battery that has suffered an impact, short circuit or other problem can even catch fire 10-15 minutes after this fact has occurred. Bring the battery to a safe place and observe for 15 minutes.

12) Do not use a battery if you suspect physical damage has occurred to the pack. Carefully inspect the battery for even the smallest of dents, cracks, splits, punctures or damage to the wiring and connectors. DO NOT allow the battery's internal electrolyte to get into eyes or on skin. Wash affected areas immediately if they come in contact with the electrolyte. If in doubt, place the battery in a fireproof location for at least 30 minutes.

AIRCRAFT BATTERY

HYBRiX 2.1 carries two 6S Lithium-Polymer batteries (LiPO). These batteries stay charged above 47.5V under normal circumstances, since they are permanently powered by the range extender. Never allow the batteries to be discharged under 46V in flight, as they do not have enough capacity to fly normally in electric-only mode and discharging is very fast. Under 44V batteries may cause fire.

To charge the batteries, place the aircraft (turned-off) on a safe place according to the safety guidelines. Then connect the battery charger to the left battery, enter the data: LiPO and 6S and charge it in " balancing " mode to 24,5V. Then connect the charger to the right battery and repeat the process.

GCS BATTERY

The ground control station batteries must be recharged before each flight session to ensure safety and proper operation of the system. The GCS includes two batteries:

Radio transmitter

The Taranis station has a 6-cell NiMH (Nickel-metal hydride) battery, which should be charged with the station off using its specific charger, provided with the radio. The charging indicator LED will light up during the process and turn off when charging is complete. Never remove the battery from the transmitter while the voltage alert is flashing, as this could result in the loss of internal settings and data.

Pay attention to the polarity of the battery connector when placing it in its compartment, otherwise the radio will not turn on.

Tablet (optional)

The Android tablet has an internal 13Wh Lithium-ion (Li-Ion) battery, which should be charged using a specific micro-USB charger.

FUEL STATION BATTERY

The fuel station carries a 3s Li-PO battery. It should be charged with the same LiPO charger than the aircraft, but selecting LiPO and 3S, as well as “balancing” on the charger options. Once the charge is finished, check that the battery voltage corresponds to the maximum per cell (4.2 V per cell), 12.6V in this case.

BATTERY RECHARGE

To recharge the batteries of the system, follow the same procedure used to charge them, as explained in Battery charge section above.

The batteries of the drone keep being charged above 47V after an operation under normal circumstances. Therefore it is not mandatory to charge the batteries of the aircraft after flying. Nevertheless the batteries of the aircraft should be balanced periodically to ensure that their cells have the same charge level, following the instructions.

BALANCING THE BATTERIES

It is recommended to perform the balancing process of the batteries prior to each flight, in order to ensure that all cells remain at the same level of charge. To do this, connect the battery charger to the left battery, enter the data: LiPO and 6S and charge it in " balancing " mode to its maximum level (24,5V). Then connect the charger to the right battery and repeat the process. At least repeat the balancing process weekly for ensure the best battery condition. If you are going to fly HYBRiX 2.1 that same day, leave both batteries at the highest charge level. If you are not going to fly, repeat the above process by downloading both batteries to their storage level.

GENERAL BATTERY MANAGEMENT

Each individual battery must be numbered and all flight time logged as part of the RPAS flight log procedure. Charge cycles must be balanced after the last flight of the day or prior to the first flight of the day.

Where possible, battery systems should not be stored in a fully charged state for periods of more than 1 week.

Battery conditions are to be monitored by each Remote Pilot. Any defects or discrepancies shall be notified to the Maintenance Controller with the affected components company ID number.

Any battery found to not meet expectations such as:

- Charging to a significantly less than rated capacity amount (20% less)
- Pre flight indications of less than 80% when fully charged
- Unexpectedly discharging more rapidly than expected (25% less flight time)

- Charging Faults
- Significant individual cell voltage differences (0.9v) during balanced charging.
- Significant cell expansion
- Signs of visible damage not as a result of normal wear and tear

must not be used for commercial operations until the Maintenance Controller determines the battery as serviceable. External maintenance providers may be used to assist in this process in consultation with the Maintenance Controller. Disposal of an unserviceable battery must be completed in accordance with State legislation and manufactures recommendations (if any).

Section 2l – DJI Mavic 3 PRO

2l.1 Pre-flight & Post-flight Check

Refer to the latest DJI Mavic 3 PRO User Manual.

https://dl.djicdn.com/downloads/DJI_Mavic_3_Pro/20230425/DJI_Mavic_3_Pro_User_Manual_EN.pdf

Mavic 2 PRO CHECKLIST : RPAS Reg. No. _____					Mission name:	
Mission Checklist						
☐	Airport(s) Notified:	☐	UAV Batteries Charged		☐	Gimbal Protector Installed
☐	Location is OK to fly		Battery 1 level:		☐	Propellers Packed
☐	Weather Forecast OK		Battery 2 level:		☐	Cables Packed
	Temperature:		Battery 3 level:		☐	Camera Filters Packed
	Wind:		Battery 4 level:		☐	Sun Shade Packed
	Precipitation:	☐	Controller Charged		☐	Tools Packed
☐	Firmware up-to-date	☐	Tablet Charged		☐	Flight Plan designed/entered in software
☐	MicroSD Card Formatted	☐	Mobile Phone Charged		☐	Log Book Packed
Launch Site Checklist						
☐	Verify Weather is OK to Fly			☐	Check for obstacles, interference	
	Temperature:			☐	Check for nearby human activity/dangerous situations	
	Wind:			☐	Verify Launch Pad is down-wind from observers	
	Precipitation:			☐	Launch Pad/Barriers Placed Signage in position as per JSA	
☐	**Safety Briefing**					
Equipment Checklist						
☐	Airframe/Landing gear inspected	☐	SD Card Installed	☐	Gimbal/Lens Protector Removed	
☐	Propellers Inspected/Attached	☐	Battery Installed	☐	Camera Filters Installed	

☐	Controller/Tablet Assembled				
Pre-Flight Checklist					
☐	Aircraft Placed on Launch Pad	☐	Check RC battery level		
☐	Turn on Remote Controller	☐	Check Aircraft Battery Level		
☐	Antennas Properly Positioned	☐	Check flight mode switch (P-Mode)		
☐	Turn on Aircraft	☐	Check Satellite and Compass status		
☐	Check the aircraft status LEDs	☐	Set RTH Location and height		
☐	Verify the gimbal is level, can move unobstructed	☐	Check camera settings		
☐	Turn on radio (if required) and check frequency is correct as per JSA. Volume up.				
Take-Off Checklist					
☐	Check launch site is clear for take off	☐	Make sure the aircraft is stable while hovering		
☐	Start the motors. Announce "TAKE OFF"	☐	Check flight controls, make sure they respond as expected		
☐	Take off and hover	☐	Start recording video		
Post Flight Checklist					
☐	Remove Battery from Aircraft & off	☐	Install Gimbal Guard	☐	Repack all equipment
	Condition of components checked: ☐ Camera (checked & off) ☐ Overall condition of frame (cracks, moisture, dust) ☐ Screws & fasteners; wiring ☐ Propellers				
☐	**Complete the Flight Log**				

2l.2 Maintenance Schedule

Pre and post flight inspections are undertaken so that any minor or major defect can be identified and rectified. Any sign of damage that may inhibit the operation of the RPAS should result in replacement of the component/s.

Component	Due (Calendar)	Due (time)	Added to Flight Log
Frame	On Condition	On Condition	N/A

ESC	On Condition	On Condition	N/A
Motor	On Condition	On Condition	N/A
Propeller	On Condition	On Condition	N/A
Flight Controller	On Condition	On Condition	N/A
Firmware	As per manufacturer release	N/A	N/A
Receiver	On Condition	On Condition	N/A
Transmitter	On Condition	On Condition	N/A
GNSS receiver	On Condition	On condition	N/A

2l.3 RPAS Maintenance & Operational Manual(s)

Copy of UAV Flight manual is kept in hardcopy in the office or can be also obtained from the web links.

Aircraft type	Title	Web link
MAVIC 3 PRO	User manual	https://dl.djicdn.com/downloads/DJI_Mavic_3_Pro/20230425/DJI_Mavic_3_Pro_User_Manual_EN.pdf
	Quick Start Guide	https://dl.djicdn.com/downloads/DJI_Mavic_3_Pro/DJI_Mavic_3_Pro_DJI_RC_Pro_Quick_Start_Guide.pdf
	Firmware update	https://www.dji.com/au/mavic-3-pro/downloads
	Online tutorials	https://www.dji.com/au/mavic-3-pro/video

2l.4 Battery Management

MAVIC 3 PRO smart batteries must be used in accordance with the safety guidelines provided by DJI. A hard copy of the DJI smart flight battery safety guidelines is available from the Chief Remote Pilot. Safety guidelines can be downloaded here:

https://support.dji.com/help/content?customId=03400006549&spaceId=34

Each individual battery must be numbered and all flight time logged as part of the RPAS flight log procedure. Charge cycles must be balanced after the last flight of the day or prior to the first flight of the day. All other charges are not required to be balanced.

Where possible, battery systems should not be stored in a fully charged state for periods of more than 1 week.

Flights should commence only with fully charged batteries.

All batteries must be charged with a suitable charging system in accordance with that chargers instructions.

Flights shall be conducted with a known starting battery percentage shown by an independent testing system that is not a part of the UAVs onboard system. Controllers are to ensure that battery power is available for the duration of the planned flight.

When in flight, battery capacity remaining may be determined by:

- Amount used in MAH compared to capacity (if fitted with a current sensor)
- Flight time
- Indicated Battery Voltage/Onboard Battery Voltage Alert

Where no telemetry data is available, it is acceptable to operate to a known flight time only.

Where only flight time is used, a minimum battery percentage of 90% is required prior to flight.

Where other telemetry data is available, a combination of methods shall be used.

Flights should only operate to 85% of battery capacity remaining.

eg, 4S 3850 MAH 15.4v battery may use 3080 MAH.

Note: Momentary fluctuations below voltage are permitted under high load situations such as a maximum rate climb; this may cause a Battery Voltage Alert system to momentarily activate.

Flights that exceed any limitation must land as soon as it is safe to do so. A flight must not knowingly exceed any limitation.

Computer based logging of all battery data is recommended via systems approved by the Maintenance Controller.

Battery conditions are to be monitored by each Remote Pilot. Any defects or discrepancies shall be notified to the Maintenance Controller with the affected components company ID number.

Any battery found to not meet expectations such as:

- Charging to a significantly less than rated capacity amount (20% less)
- Pre flight indications of less than 80% when fully charged
- Unexpectedly discharging more rapidly than expected (25% less flight time)
- Charging Faults
- Significant individual cell voltage differences (0.9v) during balanced charging.
- Significant cell expansion
- Signs of visible damage not as a result of normal wear and tear

must not be used for commercial operations until the Maintenance Controller determines the battery as serviceable. External maintenance providers may be used to assist in this process in consultation with the Maintenance Controller. Disposal of an unserviceable battery must be completed in accordance with State legislation and manufactures recommendations (if any).

Section 2m – DJI FPV

2m.1 Pre-flight & Post-flight Check

All checklists MUST be read, not called out by memory. A systematic approach to ticking off all items on the checklist is required.

Refer to the latest DJI FPV User Manual for manufacturers guidelines on flight operation. (https://www.dji.com/au/dji-fpv/downloads)

SITE & SAFETY		TICK
All company documentation packed	Complete	
Check for people or animals	Complete	
Briefings of personnel	Complete	
First Aid kit identified and accessible	Identified	
Signage	Complete	
Weather conditions suitable	Checked and noted	
RPAS FIT FOR FLIGHT		
Visually inspect the airframe	Checked	
Overall condition/cracks	Checked	
Screws and fasteners secure	Checked	
Wiring	Checked	
Connectors	Checked	
Engine & mounting screws	Checked	
Arms	Checked	
Propellers	Checked	
Camera equipment	Checked	
Transmission antennas	Checked	
Ground station (if required)	Checked	
Daily Certification	checked	
PRE FLIGHT		
Battery mounting	Checked	
Battery	Checked	
RC tramsitter	ON and checked	
Ground station (if required)	ON and checked	

Connect battery and power up LED indicators and tones Home location Ground station Camera equipment	 Checked Locked Checked PRESS RECORD	
TAKE OFF		
Ensure all people in vicinity are aware of take off Increase throttle and listen for abnormalities Hover RPAS for 5 – 10 seconds @ 1-2 m	Announce “take off”	
POST FLIGHT (inspection)		
Disconnect battery Camera equipment Battery Overall condition/cracks Screws and fasteners Wiring Connectors Engines and mounting screws Arms Propellers Transmission antennas Complete flight log AND battery log	Checked & off Checked & off Checked Checked Checked Checked Checked Checked Checked Checked Checked completed	

2m.2 Maintenance Schedule

Component	Due (Calendar)	Due (time)	Added to Flight Log
Frame	On Condition	On Condition	N/A
ESC	On Condition	On Condition	N/A
Motor	On Condition	On Condition	N/A
Propeller	On Condition	On Condition	N/A
Flight Controller	On Condition	On Condition	N/A
Firmware	As per manufacturer release	N/A	N/A

Receiver	On Condition	On Condition	N/A
Transmitter	On Condition	On Condition	N/A
GNSS receiver	On Condition	On condition	N/A

2m.3 RPAS Maintenance & Operational Manual(s)

Copy of UAV Flight manual is kept in hardcopy in the office or can be also obtained from the web links.

Aircraft type	Title	Web link
DJI FPV	User manual	https://www.dji.com/au/dji-fpv/downloads
	Quick Start Guide	https://www.dji.com/au/dji-fpv/downloads
	Firmware update	see DJI website for latest version
	Online tutorials	https://www.dji.com/au/dji-fpv/video

2m.4 Battery Management

DJI FPV smart batteries must be used in accordance with the safety guidelines provided by DJI. Safety guidelines can be downloaded here:

https://www.dji.com/au/dji-fpv/downloads

Each individual battery must be numbered and all flight time logged as part of the RPAS flight log procedure.

Where possible, battery systems should not be stored in a fully charged state for periods of more than 1 week.

Flights should commence only with fully charged batteries.

All batteries are automatically monitored by the inbuilt software in the “Smart” system

All batteries must be charged with a suitable DJI charger system for the battery type.

Flights shall be conducted with a known starting battery percentage shown by the UAVs

onboard system. Remote Pilots are to ensure that battery power is available for the duration of the planned flight.

When in flight, battery capacity remaining may be determined by:

- Amount used in MAH compared to capacity (if fitted with a current sensor)
- Flight time
- Indicated Battery Voltage/Onboard Battery Voltage Alert

Where no telemetry data is available, it is acceptable to operate to a known flight time only.

Where only flight time is used, a minimum battery percentage of 90% is required prior to flight.

Where other telemetry data is available, a combination of methods shall be used.

Flights should only operate to 15% of battery capacity remaining.

eg, 6S 4500 MAH 22.2v battery may use 3825MAH.

Note: Momentary fluctuations below voltage are permitted and are generally correctly ignored by the DJI Inspire 1's onboard system.

Flights that exceed any limitation must land as soon as it is safe to do so. A flight must not knowingly exceed any limitation.

Battery conditions are to be monitored by each Remote Pilot. Any defects or discrepancies shall be notified to the Maintenance Controller with the affected components company ID number.

Any battery found to not meet expectations such as:

- Failing in the onboard system test (Battery Monitoring System)
- Pre flight indications of less than 80% when fully charged
- Unexpectedly discharging more rapidly than expected (25% less flight time)
- Charging Faults
- Significant individual cell voltage differences (0.9v) during charging.
- Significant cell expansion
- Signs of visible damage not as a result of normal wear and tear

must not be used for commercial operations until the Maintenance Controller determines the battery as serviceable. External maintenance providers may be used to assist in this process in consultation with the Maintenance Controller. Disposal of an unserviceable battery must be completed in accordance with State legislation and manufactures recommendations (if any).

2m.6 First person view goggles

Any pilot conducting flight under VLOS or EVLOS must operate the drone by direct line of sight and visual reference to the drone itself as per CASA regulations. The DJI FPV goggles are not permitted to be used by the flying pilot unless the flight is operated under the BVLOS flight rules and proceedures. Refer to the BVLOS section of this library. Note BVLOS operations require specific approval from CASA for each operation.

Section 2n – DJI Mavic 3 E (Multispec and Thermal)

2n.1 Pre-flight & Post-flight Check

Refer to the latest DJI Mavi3 3 M User Manual.

https://dl.djicdn.com/downloads/DJI_Mavic_3_Enterprise/20221216/DJI_Mavic_3M_User_Manual_EN.pdf

https://www.dji.com/au/downloads/products/mavic-3-enterprise#doc

Mavic 3 E CHECKLIST : RPAS Reg. No. _____					Mission name:
Mission Checklist					
☐	Airport(s) Notified:	☐	UAV Batteries Charged	☐	Gimbal Protector Installed
☐	Location is OK to fly		Battery 1 level:	☐	Propellers Packed
☐	Weather Forecast OK		Battery 2 level:	☐	Cables Packed
	Temperature:		Battery 3 level:	☐	Camera Filters Packed
	Wind:		Battery 4 level:	☐	Sun Shade Packed
	Precipitation:	☐	Controller Charged	☐	Tools Packed
☐	Firmware up-to-date	☐	Tablet Charged	☐	Flight Plan designed/entered in software
☐	MicroSD Card Formatted	☐	Mobile Phone Charged	☐	Log Book Packed

Launch Site Checklist			
☐	Verify Weather is OK to Fly	☐	Check for obstacles, interference
	Temperature:	☐	Check for nearby human activity/dangerous situations
	Wind:	☐	Verify Launch Pad is down-wind from observers
	Precipitation:	☐	Launch Pad/Barriers Placed Signage in position as per JSA
☐	**Safety Briefing**		

Equipment Checklist					
☐	Airframe/Landing gear inspected	☐	SD Card Installed	☐	Gimbal/Lens Protector Removed
☐	Propellers Inspected/Attached	☐	Battery Installed	☐	Camera Filters Installed

☐	Controller/Tablet Assembled				
Pre-Flight Checklist					
☐	Aircraft Placed on Launch Pad	☐	Check RC battery level		
☐	Turn on Remote Controller	☐	Check Aircraft Battery Level		
☐	Antennas Properly Positioned	☐	Check flight mode switch (P-Mode)		
☐	Turn on Aircraft	☐	Check Satellite and Compass status		
☐	Check the aircraft status LEDs	☐	Set RTH Location and height		
☐	Verify the gimbal is level, can move unobstructed	☐	Check camera settings		
☐	Turn on radio (if required) and check frequency is correct as per JSA. Volume up.				
Take-Off Checklist					
☐	Check launch site is clear for take off	☐	Make sure the aircraft is stable while hovering		
☐	Start the motors. Announce "TAKE OFF"	☐	Check flight controls, make sure they respond as expected		
☐	Take off and hover	☐	Start recording video		
Post Flight Checklist					
☐	Remove Battery from Aircraft & off	☐	Install Gimbal Guard	☐	Repack all equipment
	Condition of components checked: ☐ Camera (checked & off) ☐ Overall condition of frame (cracks, moisture, dust) ☐ Screws & fasteners; wiring ☐ Propellers				
☐	**Complete the Flight Log**				

2n.2 Maintenance Schedule

Pre and post flight inspections are undertaken so that any minor or major defect can be identified and rectified. Any sign of damage that may inhibit the operation of the RPAS should result in replacement of the component/s.

Component	Due (Calendar)	Due (time)	Added to Flight Log
Frame	On Condition	On Condition	N/A

ESC	On Condition	On Condition	N/A
Motor	On Condition	On Condition	N/A
Propeller	On Condition	On Condition	N/A
Flight Controller	On Condition	On Condition	N/A
Firmware	As per manufacturer release	N/A	N/A
Receiver	On Condition	On Condition	N/A
Transmitter	On Condition	On Condition	N/A
GNSS receiver	On Condition	On condition	N/A

2n.3 RPAS Maintenance & Operational Manual(s)

Copy of UAV Flight manual is kept in hardcopy in the office or can be also obtained from the web links.

Aircraft type	Title	Web link
DJI FPV	User manual	https://dl.djicdn.com/downloads/DJI_Mavic_3_Enterprise/20221216/DJI_Mavic_3M_User_Manual_EN.pdf
	Quick Start Guide	https://dl.djicdn.com/downloads/DJI_Mavic_3_Enterprise/20221123/DJI_Mavic_3M-Quick_Start_Guide.pdf
	Firmware update	https://www.dji.com/au/downloads/products/mavic-3-m#firmware
	Online tutorials	https://enterprise.dji.com/mavic-3-m/video

2n.4 Battery Management

MAVIC 3 M intelligent flight batteries must be used in accordance with the safety guidelines provided by DJI. A hard copy of the DJI intelligent flight battery safety guidelines is available from the Chief Remote Pilot. Safety guidelines can be downloaded here:

https://support.dji.com/help/content?customId=03400006549&spaceId=34

Each individual battery must be numbered and all flight time logged as part of the RPAS flight log procedure. Charge cycles must be balanced after the last flight of the day or prior to the first flight of the day. All other charges are not required to be balanced.

Where possible, battery systems should not be stored in a fully charged state for periods of more than 1 week.

Flights should commence only with fully charged batteries.

All batteries must be charged with a suitable charging system in accordance with that chargers instructions.

Flights shall be conducted with a known starting battery percentage shown by an independent testing system that is not a part of the UAVs onboard system. Controllers are to ensure that battery power is available for the duration of the planned flight.

When in flight, battery capacity remaining may be determined by:

- Amount used in MAH compared to capacity (if fitted with a current sensor)
- Flight time
- Indicated Battery Voltage/Onboard Battery Voltage Alert

Where no telemetry data is available, it is acceptable to operate to a known flight time only.

Where only flight time is used, a minimum battery percentage of 90% is required prior to flight.

Where other telemetry data is available, a combination of methods shall be used.

Flights should only operate to 85% of battery capacity remaining.

eg, 4S 3850 MAH 15.4v battery may use 3080 MAH.

Note: Momentary fluctuations below voltage are permitted under high load situations such as a maximum rate climb; this may cause a Battery Voltage Alert system to momentarily activate.

Flights that exceed any limitation must land as soon as it is safe to do so. A flight must not knowingly exceed any limitation.

Computer based logging of all battery data is recommended via systems approved by the Maintenance Controller.

Battery conditions are to be monitored by each Remote Pilot. Any defects or discrepancies shall be notified to the Maintenance Controller with the affected components company ID number.

Any battery found to not meet expectations such as:

- Charging to a significantly less than rated capacity amount (20% less)
- Pre flight indications of less than 80% when fully charged
- Unexpectedly discharging more rapidly than expected (25% less flight time)
- Charging Faults
- Significant individual cell voltage differences (0.9v) during balanced charging.
- Significant cell expansion
- Signs of visible damage not as a result of normal wear and tear

must not be used for commercial operations until the Maintenance Controller determines the battery as serviceable. External maintenance providers may be used to assist in this process in consultation with the Maintenance Controller. Disposal of an unserviceable battery must be completed in accordance with State legislation and manufactures recommendations (if any).

Section 2o – DJI Matrice 350 RTK

2o.1 Pre-flight & Post-flight Check

A CASA approved checklist is to be used for any DJI M300 flight and must not be altered in any way unless authorised by the Chief Remote Pilot.

All checklists MUST be read, not called out by memory. A systematic approach to ticking off all items on the checklist is required.

Refer to the latest DJI Matrice 300 User Manual for manufacturers guidelines on flight operation.

https://dl.djicdn.com/downloads/matrice_350_rtk/20250326UM/Matrice_350_RTK_User_Manual_v1.2_en3.pdf

SITE & SAFETY		TICK
All company documentation packed	Complete	
Check for people or animals	Complete	
Briefings of personnel	Complete	
First Aid kit identified and accessible	Identified	
Signage	Complete	
Weather conditions suitable	Checked and noted	
RPAS FIT FOR FLIGHT		
Visually inspect the airframe	Checked	
Overall condition/cracks	Checked	
Screws and fasteners secure	Checked	
Wiring	Checked	
Connectors	Checked	
Engine & mounting screws	Checked	
Arms	Checked	
Propellers	Checked	
Motors	Checked	
Camera equipment	Checked	
Transmission antennas	Checked	
Ground station (if required)	Checked	
Service check	Checked	
PRE FLIGHT		
Battery mounting	Checked	

Battery RC transmitter Ground station (if required) Connect battery and power up LED indicators and tones Home location Ground station Camera equipment	Checked ON and checked ON and checked Checked Locked Checked PRESS RECORD	
TAKE OFF		
Ensure all people in vicinity are aware of take off Increase throttle and listen for abnormalities Hover RPAS for 5 – 10 seconds @ 1-2 m	Announce “take off”	
POST FLIGHT (inspection)		
Disconnect battery Camera equipment Battery Overall condition/cracks Screws and fasteners Wiring Connectors Engines and mounting screws Arms Propellers Transmission antennas Complete flight log AND battery log	Checked & off Checked & off Checked Checked Checked Checked Checked Checked Checked Checked Checked completed	

2o.2 Maintenance Schedule

The M300 maintenance manual can be downloaded here:

https://dl.djicdn.com/downloads/matrice_350_rtk/20250326UM/Matrice_350_RTK_User_Manual_v1.2_en3.pdf

Component	Due (Calendar)	Due (time)	Added to Flight Log
Frame	On Condition	On Condition	N/A
ESC	On Condition	On Condition	N/A

Motor	On Condition	On Condition	N/A
Propeller	On Condition	On Condition	N/A
Flight Controller	On Condition	On Condition	N/A
Firmware	As per manufacturer release	N/A	N/A
Receiver	On Condition	On Condition	N/A
Transmitter	On Condition	On Condition	N/A
GNSS receiver	On Condition	On condition	N/A

REGULAR MAINTENANCE

It is recommended to perform inspection and maintenance regularly by following the items below to keep the aircraft in a good condition and reduce safety risks.

Type	Maintenance Items	Maintenance Advice	Period
Basic Maintenance	1. Regular maintenance items 2. Updates and calibration 3. Deep cleaning	It is recommended to return to the factory or contact an authorized agent.	Total flight time is 200 hours, or the product has been used for 6 months.
Routine Maintenance	1. Regular maintenance items 2. Updates and calibration 3. Deep cleaning 4. Components replacement due to wear and tear	Factory Settings	Total flight time is 400 hours, or the product has been used for 12 months.
Deep Maintenance	1. Regular maintenance items 2. Updates and calibration 3. Deep cleaning 4. Components replacement due to wear and tear 5. Core component replacement	Factory Settings	Total flight time is 600 hours, or the product has been used for 18 months.

2o.3 RPAS Maintenance & Operational Manual(s)

Copy of UAV Flight manual is kept in hardcopy in the office or can be also obtained from the web links.

Aircraft type	Title	Web link
DJI Matrice 300 RTK	User Manual	https://dl.djicdn.com/downloads/matrice_350_rtk/20250326UM/Matrice_350_RTK_User_Manual_v1.2_en3.pdf
	Quick Start Guide	https://enterprise.dji.com/matrice-350-rtk/downloads
	Maintenance Manual	https://enterprise.dji.com/matrice-350-rtk/downloads

	Disclaimer and Safety Guidelines	https://enterprise.dji.com/matrice-350-rtk/downloads
	Known Issue List	https://enterprise.dji.com/matrice-350-rtk/downloads
	Intelligent Flight Battery Safety Guidelines	https://enterprise.dji.com/matrice-350-rtk/downloads
	Firmware Update	See DJI website for latest version
	Online Tutorials	https://enterprise.dji.com/matrice-350-rtk/videottps

2o.4 Battery Management

The DJI M300 Intelligent Flight Batteries must be used in accordance with the safety guidelines provided by DJI. Safety guidelines and user manuals can be downloaded here (or see above):

https://enterprise.dji.com/matrice-350-rtk/downloads

The M300 Intelligent Flight Battery applies has the capacity of 5935 mAh at a nominal voltage of 52.8 V. This product must be operated with caution and expertise.

BATTERY USE

1.) Make sure the battery is fully charged before each flight.
2.) Land the aircraft immediately when the low battery level warning activates in the DJI Pilot app. Replace or recharge the battery.
3.) Before first use, it is recommended to mark two batteries as a pair and continue using them as a pair (charge and discharge them together) to maximize service life and ensure flight performance. The aircraft my fail to take off if the two batteries have different power levels.

BATTERY MAINTENANCE CONDITIONS

Maintenance is required when any of the events below occur.
Every 50 cycles.
The battery is idle for more than three months.
There is a maintenance prompt in the app.

CHECKLIST FOR BATTERY MAINTENANCE

1.) Charge and discharge the battery as per instructions.
2.) Make sure the cell voltage difference is less than 0.1 V after the battery is fully charged and left stationary for six hours.
3.) Make sure the battery is not swollen, leaky, or damaged.
4.) Make sure battery terminals are clean.
5.) Make sure the battery firmware is updated to the latest version.

STANDARD CHARGE AND DISCHARGE OPERATION INSTRUCTIONS

1.) Charge the battery to 100% and leave the battery stationary for more than 24 hours.
2.) Install the battery into the aircraft before flight. If the remaining power level is less than 20%, land the aircraft and remove the battery.
3.) Leave the battery stationary for more than six hours.
4.) Charge the battery to 100% power level.
5.) Repeat the above steps.

BATTERY REPLACEMENT STANDARD

1.) The battery is visibly swollen, leaky, or damaged.
2.) There is a prompt of battery cell damage or over discharge in the app.
3.) The battery is rated for 200 cycles. It is not recommended to continue use afterward.
4.) The battery error still exists after performing the standard charge and discharge operations twice continuously.

BATTERY DISPOSAL

1.) Fully fill in an insulated bucket with 5% salt solution. Put the battery into it for more than 48 hours to fully discharge the battery.
2.) It is recommended to recycle the battery by a recycling agent to avoid environmental pollution.

EMERGENCIES

1.) Put out any battery fire using sand or a dry powder fire extinguisher.
2.) Put the battery into 5% salt solution immediately if the battery shell has visible damage. DO NOT use the battery afterward.
3.) If any electrolytes make contact with your skin, immediately wash the affected area with clean running water or alkaline hand sanitizer for at least 15 minutes. See a doctor immediately.

WARNINGS

1.) It is recommended to charge and discharge the battery in a special explosion-proof cabinet.
2.) DO NOT charge the battery near flammable materials, objects or on flammable surfaces.
3.) DO NOT use the battery in a humid environment to avoid shot circuit.
4.) Never disassemble or pierce the battery in any way.
5.) Store Intelligent Flight Batteries in a well-ventilated and dry place.
6.) Initial RTH immediately when the battery temperature is 80° C (176° F) or higher.

GENERAL BATTERY MANAGEMENT

Each individual battery must be numbered, and all flight time logged as part of the RPAS flight log procedure.

Batteries must be charged with a suitable DJI charger system for the battery type.
Flights shall be conducted with a known starting battery percentage shown by the UAVs onboard system. Remote Pilots are to ensure that battery power is available for the duration of the planned flight.
Flights should only operate to 15% of battery capacity remaining.

Flights that exceed any limitation must land as soon as it is safe to do so. A flight must not knowingly exceed any limitation.

Battery conditions are to be monitored by each Remote Pilot. Any defects or discrepancies shall be notified to the Maintenance Controller with the affected components company ID number.

Any battery found to not meet expectations such as:

- Failing in the onboard system test (Battery Monitoring System)
- Pre flight indications of less than 80% when fully charged
- Unexpectedly discharging more rapidly than expected (25% less flight time)
- Charging Faults
- Significant individual cell voltage differences (0.9v) during charging.
- Significant cell expansion
- Signs of visible damage not as a result of normal wear and tear

must not be used for commercial operations until the Maintenance Controller determines the battery as serviceable. External maintenance providers may be used to assist in this process in consultation with the Maintenance Controller. Disposal of an unserviceable battery must be completed in accordance with State legislation and manufactures recommendations (if any).

M300 INTELLIGENCE FLIGHT BATTERY SPECIFICATIONS

Nominal Voltage: 52.8 V
Battery Type: LiPo Battery 12S
Operating Temperate Range: -20°C to 50°C
Storing Temperate Range: 22°C to 30°C
Charging Temperate Range: 5°C to 40°C
Compatible Charging Device: BS60 Intelligent Battery Station
Capacity: 5935 mAh
Energy: 274 Wh
Battery Charging Time: 220V input: 60 mins (fully charging 2 x TB60 batteries)
30 mins (charge 2 x TB60 batteries from 20% to 90%)
110V input: 70 mins (fully charging 2 x TB60 batteries)
40 mins (charge 2 x TB60 batteries from 20% to 90%)
Max Charging Power: 470 W
Weight: ~1.35 kg (single battery)

Section 2p – DJI Mavic 4 Pro

Specifics: DJI Mavic 4 Pro 512 GB Creator Combo (DJI RC Pro 2)

2p.1 Pre-flight & Post-flight Check

Refer to the latest DJI Mavic 4 Pro User Manual.

https://dl.djicdn.com/downloads/mavic-4-pro/20250513/DJI_Mavic_4_Pro_User_Manual_v1.0_en.pdf

Mavic 4 Pro Checklist: RPAS Reg. No. _____					Mission name:	
Mission Checklist						
☐	Airport(s) notified:	☐	UAV batteries charged		☐	Gimbal protector installed
☐	Location is OK to fly		Battery 1 level:		☐	Propellers attached
☐	Weather forecast OK		Battery 2 level:		☐	Charging cables packed
	Temperature:		Battery 3 level:		☐	Camera Filters packed
	Wind:	☐	DJI Fly app downloaded		☐	Sunshade packed
	Precipitation:	☐	Controller charged		☐	Tools packed
☐	Firmware up to date	☐	Tablet charged		☐	Flight plan designed/entered in software
☐	MicroSD card formatted	☐	Mobile phone charged		☐	Logbook packed
Launch Site Checklist						
☐	Verify weather is OK to fly	☐	Check for obstacles, interference			
	Temperature:	☐	Check for nearby human activity/dangerous situations			
	Wind:	☐	Verify launch pad is downwind from observers			
	Precipitation:	☐	Launch pad/barriers placed Signage in position as per JSA			
☐	**Safety Briefing**					
Equipment Checklist						
☐	Airframe/landing gear inspected	☐	Screws and fasteners secured	☐	Gimbal/lens protector removed	
☐	Propellers inspected/attached	☐	Battery installed		SD card installed	

Pre-Flight Checklist					
☐	Unfolded aircraft placed on launch pad	☐	Check the flight mode switch (N-Mode)		
☐	Turn on the remote controller (manual or automatic)	☐	Check the mode of the control sticks		
☐	Antennas positioned downwards	☐	Set obstacle avoidance action		
☐	Check the aircraft status LEDs	☐	Check satellite and compass status		
☐	Verify the gimbal is level, and can move unobstructed	☐	Set RTH location and height		
☐	Turn on the radio (if required) and check that the frequency is correct as per JSA. Volume up.	☐	Check camera settings		
☐	Check RC battery level	☐			
☐	Check aircraft battery level	☐			
Take-Off Checklist					
☐	Check that the launch site is clear for take-off	☐	Make sure the aircraft is stable while hovering		
☐	Start the motors. Announce “TAKE-OFF”	☐	Check flight controls, make sure they respond as expected		
☐	Take off and hover	☐	Start recording video		
Post Flight Checklist					
☐	Remove battery from aircraft & turn off	☐	Install gimbal guard	☐	Repack all equipment
	Condition of components checked: ☐ Camera (checked & off) and gimbal ☐ Overall condition of frame (cracks, moisture, dust) ☐ Screws & fasteners; wiring ☐ Propellers				
☐	**Complete the Flight Log**				

2p.2 Maintenance Schedule

Pre- and post-flight inspections are undertaken to identify and rectify any minor or major defects. Any sign of damage that may inhibit the operation of the RPAS should result in the replacement of the component/s.

Component	Due (Calendar)	Due (time)	Added to Flight Log
Frame	On Condition	On Condition	N/A

ESC	On Condition	On Condition	N/A
Motor	On Condition	On Condition	N/A
Propeller	On Condition	On Condition	N/A
Flight Controller	On Condition	On Condition	N/A
Firmware	As per the manufacturer's release	N/A	N/A
Receiver	On Condition	On Condition	N/A
Transmitter	On Condition	On Condition	N/A
GNSS receiver	On Condition	On condition	N/A

2p.3 RPAS Maintenance & Operational Manual(s)

It is recommended to perform inspection and maintenance regularly by following the items below to keep the aircraft in a good condition and reduce safety risks.

Type	Maintenance items	Maintenance advice	Period
Basic maintenance	1. Regular maintenance items 2. Updates and calibration 3. Deep cleaning	It is recommended to return to the factory or contact an authorised agent.	Total flight time is 200 hours, or the product has been used for 6 months.
Routine maintenance	1. Regular maintenance items 2. Updates and calibration 3. Deep cleaning 4. Components replacement due to wear and tear	Factory settings	Total flight time is 400 hours, or the product has been used for 12 months.
Deep maintenance	1. Regular maintenance items 2. Updates and calibration 3. Deep cleaning 4. Components replacement due to wear and tear 5. Core component replacement	Factory settings	Total flight time is 600 hours, or the product has been used for 18 months.

A copy of the UAV Flight manual is kept in hard copy in the office and can be obtained from the web links.

Aircraft type	Title	Web link
Mavic 4 Pro	User manual	https://dl.djicdn.com/downloads/mavic-4-pro/20250513/DJI_Mavic_4_Pro_User_Manual_v1.0_en.pdf
	Beginner's guide	https://support.dji.com/help/content?customId=en-us03400012002&spaceId=34&re=GB&lang=en

	Quick start guide	https://dl.djicdn.com/downloads/mavic-4-pro/20250513/DJI_Mavic_4_Pro_Quick_Start_Guide_CreatorCombo_v1.0.pdf
	Safety guidelines	https://dl.djicdn.com/downloads/mavic-4-pro/20250513/DJI_Mavic_4_Pro_Safety_Guidelines_RCPro2_v1.0.pdf
	Parallel charging hub	https://dl.djicdn.com/downloads/mavic-4-pro/20250513/DJI_Mavic_4_Pro_Parallel_Charging_Hub_User_Guide_v1.0.pdf
	Firmware update	https://www.dji.com/au/downloads/products/mavic-4-pro#app
	Online tutorials	https://www.dji.com/au/mavic-4-pro/video

Downloads for Mavic Pro 4 can be accessed at:

https://www.dji.com/au/mavic-4-pro/downloads?site=brandsite&from=insite_search

2p.4 Battery Management

Mavic 4 Pro smart batteries must be used in accordance with the safety guidelines provided by DJI.

Safety guidelines can be downloaded here:

https://dl.djicdn.com/downloads/mavic-4-pro/20250513/DJI_Mavic_4_Pro_Safety_Guidelines_RCPro2_v1.0.pdf

Also see section 5.8 Intelligent Flight Battery in the user manual:

https://dl.djicdn.com/downloads/mavic-4-pro/20250513/DJI_Mavic_4_Pro_User_Manual_v1.0_en.pdf

Each battery must be numbered, and all flight time logged as part of the RPAS flight log procedure. Charge cycles must be balanced after the last flight of the day or before the first flight of the day. All other charges are not required to be balanced.

Where possible, battery systems should not be stored in a fully charged state for periods of more than 1 week.

Flights should commence only with fully charged batteries.

All batteries must be charged with a suitable charging system in accordance with that charger's instructions.

Flights shall be conducted with a known starting battery percentage shown by an independent testing system that is not a part of the UAV's onboard system. Controllers are to ensure that battery power is available for the duration of the planned flight.

When in flight, battery capacity remaining may be determined by:

- Amount used in MAH compared to capacity (if fitted with a current sensor)

- Flight time
- Indicated Battery Voltage/Onboard Battery Voltage Alert

Where no telemetry data is available, it is acceptable to operate to a known flight time only.

Where only flight time is used, a minimum battery percentage of 90% is required prior to flight.

Where other telemetry data is available, a combination of methods shall be used.

Flights should only operate to 85% of battery capacity remaining.

e.g., 4S 3850 MAH 15.4v battery may use 3080 MAH.

Note: Momentary fluctuations below voltage are permitted under high load situations such as a maximum rate climb; this may cause a Battery Voltage Alert system to momentarily activate.

Flights that exceed any limitation must land as soon as it is safe to do so. A flight must not knowingly exceed any limitation.

Computer-based logging of all battery data is recommended via systems approved by the Maintenance Controller.

Battery conditions are to be monitored by each Remote Pilot. Any defects or discrepancies shall be notified to the Maintenance Controller with the affected components company ID number.

Any battery found not to meet expectations, such as:

- Charging to a significantly less than rated capacity amount (20% less)
- Pre-flight indications of less than 80% when fully charged
- Unexpectedly discharging more rapidly than expected (25% less flight time)
- Charging Faults
- Significant individual cell voltage differences (0.9v) during balanced charging.
- Significant cell expansion
- Signs of visible damage not because of normal wear and tear

must not be used for commercial operations until the Maintenance Controller determines the battery as serviceable. External maintenance providers may be used to assist in this process in consultation with the Maintenance Controller. Disposal of an unserviceable battery must be completed in accordance with State legislation and manufacturer's recommendations (if any).

APPENDIX 1: Operations between 30 and 15 m Pre-op Briefing & Consent

PRE-OPERATIONAL BRIEFING: Operations between 30 & 15 m of non-company personnel	
ACTION	
Overview of the mission as planned	☐
Instruct non-operational personnel of the CASA regulations regarding operation within 30 metres of non-company/operational personnel.	☐
Validate the JSA and ensure all additional safety measures are made clear to all non-operational personnel. This will include details of - Speed of the RPAS - Size of the RPAS - Flight path - Identify safety crew - Identify pre-determined plan of action in case of RPAS malfunction - Instruct each individual of their position (fixed or moving) and movement limitations during the RPAS flight	☐
Ensure all parties have consented to the RPAS flight.	☐
CONSENT – NON-OPERATIONAL PERSONNEL	**DATE**

NAME (print)	SIGNATURE

APPENDIX 2: BVLOS Operations

These procedures apply to company BVLOS operations and override any contradictory VLOS procedures detailed in the company operations manual suite, except where the provision expressly says otherwise.

1. Definitions

AIP	Aeronautical Information Publication
CCN	Crew Communication Network – a radiotelephony system used for communication between operational crew
Controlled Ground Area	A ground area with access control which provides the Remote Pilot certainty that there are no ground risks beneath the aircraft
BVLOS	Beyond Visual Line of Sight – a set of operating procedures that utilises digital information for situational awareness of air and ground risks to allow the RPIC to not have constant VLOS with the RPA during all stages of flight
RPIC	Remote Pilot in Command
RPA	Remotely Piloted Aircraft
RPL	Remote Pilot Licence
Observer	Observer trained to assist on BVLOS operations

2. Area approval

Prior to RPAS operations being conducted Beyond Visual Line of Sight (BVLOS) an area approval must be obtained from CASA. Remote Pilots are to familiarise themselves with the contents of the Area Approval including any restrictions that may have been put in place.

3. Requirements for BVLOS Crew

3.1 Requirements for Remote Pilot

Any Remote Pilot engaged in BVLOS operations must:

hold a pass in the CASA Instrument Rating Exam (IREX) or have an equivalent qualification (as recognised by CASA)
have at least 20 hours operating RPA above 250 grams of which:
at least 5 hours shall be on the aircraft type to be operated BVLOS
hold an Aeronautical Radio Operators Certificate or higher aviation radio qualification
have a visual acuity that complies with the Austroads standard for private motor vehicle licensing visual acuity

(https://austroads.com.au/__data/assets/pdf_file/0022/104197/AP-G56-17_Assessing_fitness_to_drive_2016_amended_Aug2017.pdf)

have completed company BVLOS training
have passed an BVLOS proficiency check within:
the past 12 months; or

the past 24 months, provided the remote pilot has completed at least 3 BVLOS flights in each of the 12-month periods before the BVLOS operation

Training and proficiency checks are to be recorded in Remote Pilot Training records located in Appendix 12. Induction and proficiency check details can be found in Schedules 1 and 2 to this Appendix.

3.2 Requirements for Observer

Unless otherwise approved by the Chief Remote Pilot, there will be an observer assigned to each flight operating beyond line of sight where:

the Remote Pilot does not have VLOS of the RPA during take-off or landing

the RPA is operated in an area that requires VLOS for airspace separation and the Remote Pilot does not have a clear view of the airspace in which the RPA is operated.

Any Observer engaged in BVLOS operations must have completed company BVLOS observer training.

4. BVLOS training

4.1 Remote Pilot Training

Prior to commencement of BVLOS operations each Remote Pilot shall receive training in accordance with Schedule 1 of this Appendix. The training shall be provided by the Chief Remote Pilot or suitably qualified person or organisation delegated by the Chief Remote Pilot.

Completion of training shall be recorded in the Remote Pilot's training records and maintained for a period of at least 7 years

4.2 BVLOS Observer training

Prior to commencement of BVLOS operations each Observer shall receive training in accordance with Schedule 3 to this Appendix. The training shall be provided by the Chief Remote Pilot or suitably qualified person or organisation delegated by the Chief Remote Pilot.

Details of observers who have successfully completed training shall be entered in the trained BVLOS Observer register contained in Schedule 3. Each entry in the register shall be retained for a period of 7 years from the date of entry.

5. BVLOS proficiency Checks

BVLOS proficiency checks covering the items detailed in Schedule 2 shall be carried out by the Chief Remote Pilot or, at the Chief Pilot's direction, a person who:

Is certified to conduct an RPL training course;

holds an IREX pass; and

has experience operating RPAS under a BVLOS approval,

on each BVLOS approved Remote Pilot within the periods specified in section 3.1.

Results of BVLOS proficiency checks shall be recorded in the Remote Pilot's training records and maintained for a period of at least 7 years

6. Responsibilities and accountabilities of BVLOS Crew

6.1 Responsibilities and Accountabilities of Remote Pilot

The Remote Pilot is responsible for the overall safety of flight from start to finish. Either directly or by the use of trained Observers the Remote Pilot is shall ensure:

- the position of the aircraft is known at all times and separation is maintained with other airspace users and persons or property at risk on the ground
- appropriate aviation radio communication is made
- communication between all relevant crew is maintained throughout the flight
- operations are conducted in accordance with company operating procedures including the JSA and Flight Authorisation.

6.2 Responsibilities and Accountabilities of Observer

During an BVLOS operation utilising an observer it is the Observer's duty to:

restrict access to RPAS take-off and landing area

keep watch for aircraft and other hazards

7. RPA equipment requirements for BVLOS operations

In addition to any other equipment requirements detailed in the company operations manual suite (such as equipment for operations at night), any time while an RPA is operated BVLOS the aircraft must have:

- a lock on a minimum of 5 GNSS satellites or such other higher number as specified by the manufacturer as the minimum number for automated flight operations
- a command and control link with the Remote Pilot station that shows the position, direction of flight and height of the RPA at all staged during flight
- when operating over an area which is not a controlled ground area and outside of the Remote Pilot or Observer's VLOS of the ground area below the RPA, a live video feed of the ground area below the RPA sufficient for the Remote Pilot or Observer to determine and ground risks below the RPA prior to the RPA flying over or in the vicinity of the ground risk.

If at any stage during flight any of the above equipment requirements are not met the Remote Pilot shall immediately return the RPA to VLOS operations or land the RPA in a safe location.

Where available ADS-B in should be used as a situational awareness tool. It is important to note ADS-B does not see all aircraft and most aircraft which pose a risk to the operation will not be shown.

8. BVLOS aviation radiotelephony procedures and requirements

The relevant CTAF or FIA frequency must be used during all operations. When operating in class G airspace, the Remote Pilot shall ensure broadcasts are made at least 15 minutes prior to launch and every 15 minutes thereafter until completion of BVLOS flight operations.

The Remote Pilot may delegate an appropriately trained and certified Observer to make radio broadcasts. Where the Observer is not co-located with the Remote Pilot, any relevant aviation radio transmission received shall be immediately communicated to the Remote Pilot.

Unless utilising an aviation radio system with an antenna elevated above the surrounding ground obstacles (e.g. trees) and range of at least 5km beyond the maximum distance the RPA is to be operating from the radio system, aviation radio broadcasts shall be made from a position no greater than 1500m from the RPA. Where due to the tracking of the RPA a change of aviation radio operator is required, the Remote Pilot shall broadcast to all crew the change instruction and confirm that the instruction has been understood by the present and new aviation radio operator.

9. BVLOS crew radiotelephony procedures and requirements

9.1 Communication System(s)

Unless co-located, all operational crew are to be in constant communication with each other during BVLOS flight operations via a CCN. The radiotelephony system for the CCN is via a live mobile telephone link (conference call where applicable) to facilitate duplex communications. In the event mobile telephone communication are not available, not reliable or not appropriate for the operation (for example where there are a large number of crew such that congestion on a conference call may cause an operational risk), UHF communications will be utilised.

A secondary CCN must be available throughout BVLOS operations. Mobile telephone **must not** be used as both the primary and secondary CCN.

The primary and secondary CCN is to be tested onsite at the crew allocated locations prior to launch of the RPA to unsure adequacy and reliability. Caution should be exercised when utilising an unencrypted UHF system due to the possibility of third-party transmission. Where unencrypted UHF communications are utilized the operating crew are to assess UHF channel usage in the area of operations and select a channel that has the lowest likelihood of third-party transmission. Where there is a high likelihood of third-party transmissions interfering with the safety of RPAS operations the UHF system is deemed unserviceable.

9.2 Content of Communications

The content of crew communication is operational dependent. As a minimum the Remote Pilot is to communicate:

- ready for take-off
- proceeding to mission
- on mission
- off mission
- landing

The Observers is to communicate:

- area clear prior to launch and landing
- details of any air or ground obstacle is likely to or has entered the operational area

Where simplex communication systems are used, aviation radio protocols as detailed in AIP will be adopted. When conveying risk locations, Observers are to adopt the clock code where practicable, referencing the nose of the aircraft.

10. BVLOS pre-flight briefing

All personnel involved in an BVLOS operation must participate in a Safety Briefing prior to flight to ensure that everyone has an understanding of the operation and of individual roles and responsibilities.

In addition to items detailed in the company standard pre-flight briefing, the following should be listed as additional items on the standard prefight briefing and discussed prior to commencement of BVLOS operations:

- Aircraft flight paths when BVLOS
- Primary and secondary communication links (if applicable)
- BVLOS communication protocols
- Anticipated BVLOS flight area and any relevant no-fly zones
- Emergency procedures when BVLOS
- Behaviour of aircraft upon return to home and link loss during all stages of flight
- Location specific BVLOS hazards
- Incident/Accident response when BVLOS
- Location of crew
- Personnel roles/responsibilities and assignment of tasks
- Any proposed change crew during flight
- Crew callsigns

The brief should include the use of any relevant maps or aeronautical charts, ensure the pilot and observers are familiar the flight area and any prominent features within the section.

11. Maximum distance for BVLOS operations

11.1 Maximum Operating Range (Link)

The Chief Remote Pilot shall not approve a BVLOS operations where the aircraft manufacturer has not published a maximum link range.

Unless otherwise approved by CASA, the RPA shall not be operated during BVLOS operations at a distance from the remote pilot station that is greater than 80% of the maximum link range published by the manufacturer for flights below 500ft.

The Remote Pilot shall ensure that there are no obstructions between the remote pilot station and the RPA during BVLOS operations that would result in a loss of command and control link.

11.2 Maximum Operating Range (endurance)

During BVLOS operations the Remote Pilot shall ensure that the RPA has at least 1.5X the endurance required to return to home (or to a planned safe alternate landing area) and execute a landing. In the event that a planned landing area becomes unavailable during an BVLOS flight the Remote Pilot shall immediately reassess the flight endurance based on the remaining landing areas and reduce flight time accordingly.

12. BVLOS approved areas

BVLOS operations shall only be conducted in locations approved for BVLOS RPAS operations through the area approval from CASA. Locations specific operations requirements are detailed in Schedule 5

of this Appendix. Where a no-fly area is listed in Schedule 5 the Remote Pilot must ensure that the RPA is not operated BVLOS over the no-fly area. Where a requirement for stakeholder engagement for the area is listed in Schedule 5 the Chief Remote Pilot must not authorise BVLOS operations at the area until completion of stakeholder engagement.

13. Takeoff/Landing areas

Unless specifically approved by the Chief Remote Pilot, the Remote Pilot shall be positioned with a clear view of the takeoff and landing area.

Where the Remote Pilot is not positioned with a clear view of the takeoff or landing area:

- an Observer must be located at each takeoff and landing area to ensure clearance from persons on the ground during takeoff or landing. The Observer used for this purpose must be trained in the ground handling procedures for the particular RPA
- the Remote Pilot shall personally inspect each takeoff and landing area to confirm suitability prior to flight
- landing shall be made automated where possible
- any additional procedures and considerations relating to the takeoff and landing areas must be included in the prefight brief, including:
    - possible link loss on landing and consequences including any requirement to update RPA home location
    - any need to mark landing area centre to ensure visibility when utilising a live video stream to assist ground clearance
    - any additional communication requirements between the Remote Pilot and Observer(s) during the takeoff and landing phases

14. BVLOS ground risk mitigation

14.1 Obstacle avoidance and no fly zones

Standard distance limits from people must be maintained at all times. Flight is not to be conducted over a populous area. Where ground personnel may exist, no fly zones are to be detailed and briefed prior to the RPAS operations being conducted.

14.2 Flight over M, A and B class roadways

Flights over M, A or B class roadways are to be conducted perpendicular to the direction of the roadway and at such a height which, in the event of an emergency or failure of the RPA, the RPA is able to safely avoid the road.

14.3 Operations where ground area not in VLOS of Observer or Remote Pilot

The RPA must not be operated BVLOS over a ground area that is not within VLOS of the Remote Pilot or an Observer unless either:

- the RPA is fitted with a video camera:
    - of sufficient resolution to identify at risk persons and property beneath the RPA
    - oriented in such a manner that the ground area beneath the aircraft including any area that the aircraft may impact in the event of a system or control failure is in view
    - that has a live link to the Remote Pilot on an observer with a display of sufficient:
        - brightness
        - resolution
        - size
        - contract; and
        - lack of latency
    - that is monitored at sufficient intervals to ensure the ground area is clear

or:

- The RPA is operating over a Controlled Ground Area.

If at any stage during flight the Remote Pilot does not have sufficient information to meet the separation requirements with persons or property on the ground the Remote Pilot shall immediately discontinue the operations.

15. BVLOS Weather

In addition to any weather requirements for the specified RPA and for normal company RPA operations, BVLOS operations shall not be commenced where the visibility is less than 5000m measured in all directions from the position of the RPA. In the event visibility falls below 5000m whilst operating BVLOS, the Remote Pilot shall, as soon as safely possible, return the RPA to VLOS operations or land the RPA.

While operating BVLOS the RPA is to be maintained at least 1000ft below the cloud base.

Wherever possible information from an aviation weather station (AWIS, METAR, ATIS) shall be used to determine visibility and cloud base. When not in the vicinity of an aviation weather station the

Remote Pilot shall determine visibility and cloud base by utilising topographical features in the vicinity of drone operations.

16. BVLOS in controlled airspace

BVLOS operations in controlled airspace shall be conducted in accordance with all applicable requirements and considerations for the VLOS operation of RPA in controlled airspace.

Prior to the Chief Remote Pilot approving BVLOS operations within controlled airspace consideration of any additional risks should be had and appropriate risk mitigators implemented.

17. BVLOS at night

BVLOS operations conducted at night shall be in accordance with the requirements and provisions for the VLOS operation of an RPA at night.

Prior to the Chief Remote Pilot approving BVLOS operations at night consideration of any additional risks should be had and appropriate risk mitigators implemented.

18. BVLOS operations in the vicinity of an aerodrome

BVLOS operations conducted within 3nm of an aerodrome (Airport/HLA/ALA) shall be in accordance with the requirements and provisions for the VLOS operation of an RPA in the vicinity of aerodromes.

In addition,

Aerodromes within the vicinity are to be advised (where practical) detailing:

the location of the RPAS operations (including minimum planned distance from the aerodrome)

the frequency(s) the Remote Pilot will be monitoring

a contact number for the Remote Pilot/Spotter

what will take place in the event of an emergency

the elevation difference between the aerodrome (as published in the AIP) and the zero height of the RPA shall be noted on all devices used to identify the RPA's height so that the relevant crew can establish the RPA's height relative to the aerodrome

19. Co-ordination with local air traffic

To mitigate the risk of collision with locally operated piloted aircraft when operating BVLOS, remote pilots shall contact the relevant local operators prior to commencement of flight BVLOS to advise the operators of the following:

- the location of BVLOS operations
- the nature of BVLOS operations
- expected time of BVLOS operations
- expected altitude

The Chief Remote Pilot may arrange a standing notification with local air traffic in lieu of notification for each sortie.

20. BVLOS deconflict with manned aircraft when BVLOS

Procedural separation with other air traffic must be ensured. A minimum of 500 feet vertically and 1500 metres horizontally must be maintained at all times. Where separation comes into question the RPAS operations are to give way immediately to manned aircraft.

To mitigate the risk of collision with manned aircraft whilst operating BVLOS, the Remote Pilot or a suitably qualified and Observer must monitor the relevant aviation VHF frequency for the area of operations for the entire duration of the flight.

Where a manned aircraft is identified within the distances mentioned below, the corresponding actions must be taken;

- Within 5 nm of BVLOS RPA operations, and ≤ 1000 ft. vertical separation;
    - Contact manned aircraft via VHF and advise;
        - RPA position, height & intention
    - Conduct loiter in present position
    - Do not resume mission from loiter unless:
        - 1000 ft. or greater vertical separation can be maintained; or
        - Manned aircraft verified outside 5nm of operations
- Within 3 nm of BVLOS RPA operations, and ≤ 1000 ft. vertical separation;
    - Conduct emergency descent to lowest safe altitude
    - Contact manned aircraft via VHF and advise;
        - RPA position, height, intention
    - Conduct loiter in present position until manned aircraft is outside 3nm radius, or
- If position of manned aircraft cannot be verified, separation cannot be maintained, and the Remote Pilot believes further operations will increase risk of collision, conduct emergency landing of the RPA.

The Remote Pilot shall advise Observers of any deviation from the planned flight as soon as practicable.

21. BVLOS NOTAM requirements

Unless otherwise approved by CASA, the Remote Pilot shall ensure a NOTAM is published advising other aircraft of the intended BVLOS operations prior each BVLOS flight. The Chief Remote Pilot shall be responsible for the issue of the NOTAM.

22. BVLOS traffic log

The Remote Pilot shall keep a traffic log (See Schedule 6 of this Appendix) during BVLOS operations detailing all manned aircraft movements and radio communications that occur within the vicinity of the operational area.

The Chief Remote Pilot shall review the traffic logs from time to time and make any required amendments to the applicable location specific procedures and stakeholder engagement to ensure conflict with manned traffic is minimised.

23. BVLOS Emergency Planning and Reaction

Prior to the commencement of BVLOS operations over an area with a population density of sparsely (See JARUS SORA) or greater, the Chief Remote Pilot must confirm that the operator has undergone a tabletop or onsite emergency simulation to test the company emergency response plan within the past 12 months.

In the event of an emergency, the Remote Pilot is to follow the emergency procedures for the RPA flown, as specified by the manufacturer. The Remote Pilot is to advise the plan of action to the observer, who may then contact any relevant parties detailed in the pre-operational brief. Consideration is to be made of other airspace users and those on the ground. If positive separation from people or aircraft cannot be maintained the emergency motor stop is to be used over a known safe area.

24. RPAS Emergencies Procedures when BVLOS

24.1 Loss of link when BVLOS

- Observer (where applicable) sight RPA and confirm tracking as per program (return to home, loiter, etc.)
- Remote Pilot attempt to re-establish link
- Monitor airspace and make appropriate radio calls

24.2 Loss of flight data when operating BVLOS

- Climb aircraft to safe height (caution overflying aircraft)
- Broadcast to all crew that aircraft lost
- Confirm safe return to home from last known position
    - If return to home safe:
        - activate return to home
    - If not safe to return to home:
        - Loiter aircraft
        - Available Observer(s) to move to RPA last know position
        - Broadcast on aviation radio including “caution lost RPA, last known position [X]”
        - Once VLOS or flight data regained, land aircraft in nearest safe location

19.3 GPS loss when BVLOS

- Climb aircraft to safe height (caution overflying aircraft)
- Broadcast to all crew “GPS lost”
- All available Observers to move toward RPA last know position until VLOS and then maintain VLOS

If **live camera feed available**:

- Orient camera to RPA nose
- Yaw RPA to find home
- Track RPA home and land as soon as possible

If tracking home not safe:

- Track to nearest safe location (preferably where Observer can sight landing)
- Land RPA in nearest safe location (caution, landing without GPS and VLOS likely to result in controlled crash, Remote Pilot to ensure ground area clear)

If **reliable heading data available** (but no video data):

- Turn RPA toward Remote Pilot where direct track allows (adjusting for wind drift)
- If track to Remote Pilot has obstacles, turn RPA to nearest Observer that has a safe track (adjusting for wind drift)
- Broadcast on aviation radio including "caution lost RPA, last known position [X]"
- When VLOS regained, land aircraft in nearest safe location

If unable to recover VLOS or video data:

- Track aircraft from dead reckoned position to nearest large open area (adjusting for wind drift)
- Once assured over open area, activate RPA emergency flight termination

If no VLOS, reliable heading data or video data:

- Track aircraft from dead reckoned position to nearest large open area (adjusting for wind drift)
- Broadcast on aviation radio including "caution lost RPA, last known position [X]"
- Once assured over open area, activate RPA emergency flight termination

24.4 Suspected or actual loss of voice communications (aviation or company)

- Immediately broadcast "radio check"
- If no response, change to alternate radio / radio system where available
- Where radio communication cannot be re-established, continue to make radio broadcasts prefixed with "transmitting blind"
- Land aircraft as soon as possible in safe location

24.5 Emergency flight termination when BVLOS

- Maintain control of aircraft where possible

- Maneuver aircraft where possible to safe impact zone
- Execute flight termination

Schedule 1 – BVLOS Remote Pilot Training Syllabus

The below training is in addition to the remote pilot obtaining a pass in the CASA IREX theory and any general induction and aircraft type training.

BVLOS-DT: Beyond visual line of sight - Description of training

1 Unit description

This unit describes the skills and knowledge required for a remote pilot to operate an RPA beyond visual line of sight.

2 Elements and performance criteria

2.1 Pre-flight preparation

The remote pilot confirms that:

(a) the RPA meets the equipment requirements for a BVLOS flight.

(b) a risk assessment is completed taking into account BVLOS conditions.

2.2 BVLOS Operations

(a) Perform all normal manoeuvres under BVLOS conditions using either manual control or an AFMS.

(b) Orient and navigate the RPA efficiently and safely BVLOS.

(c) Maintain an effective situational awareness for other aircraft and persons/property in the operational area and take appropriate action to maintain separation and prevent conflict.

(a) Perform emergency manoeuvres under BVLOS conditions using both manual control and an AFMS.

3 Range of variables

(a) Various payloads and RPA configurations

(b) Various weather conditions

4 Underpinning knowledge of the following:

(a) RPA equipment requirements

(b) Human performance considerations

(c) Airspace considerations

(d) Knowledge of rules and considerations under BVLOS

(e) Management of risk to persons/property on ground in area

(f) BVLOS operational requirements for operations near aviation landing facilities

(g) Airband radio procedures under BVLOS

(h) Command and control link considerations under BVLOS

Schedule 2 – BVLOS Remote Pilot Proficiency Check Requirements

BVLOS-T: Beyond visual line of sight - Theory

Beyond Visual Line of Site Theory test requirements

1 A remote pilot operating under a beyond visual line of sight (BVLOS) approval must demonstrate his or her knowledge and understanding of the items of theory detailed in clause 2 by answering an oral test provided by the Chief Remote Pilot or their delegate.

2 The student:

(a) Is aware of any RPA equipment requirements when operating BVLOS

(b) Understands any human performance considerations for operations BVLOS

(c) Understands likely traffic flow of piloted aircraft in BVLOS area

(d) Knows the definition of VLOS and when an aircraft is considered to be BVLOS

(e) Can detail how to manage risk to persons and property on the ground BVLOS

(f) Knows airband radio procedures for operations under BVLOS and limitations of airband radio

(g) Understands specific requirements of CASA BVLOS approval for the operational area

(h) Understands limitations of command and control link

(i) Can describe the additional considerations for coping with equipment failures BVLOS

(j) Describe and list any special precautions a remote pilot might take for a BVLOS operation

(k) Can detail how to manage air risks when BVLOS

(l) Knows how to operate company communication system(s) to be utilised when BVLOS

B-VLOS-P: Beyond visual line of sight - Practical

Flight test requirements

1 A person operating under a beyond visual line of sight (BVLOS) approval must demonstrate his or her competency, in the units of competency mentioned in clause 4, by performing manoeuvres with an aircraft in the category he or she wishes to operate, within the accuracy/tolerances specified clause 2.

2 For clause 1, a sustained deviation outside the applicable flight tolerance is not permitted.

3 Note that flight tests elements for BVLOS approval may be combined into a single test or conducted over a number of flights.

4 Practical flight standards:

Ensures the aircraft is fit to fly and equipped for BVLOS flight
Competently conducts all normal manoeuvres BVLOS manually or with AFCS as applicable
Competently conducts link loss manoeuvre BVLOS manually and with AFCS
Maintains situational awareness for other aircraft when BVLOS and takes appropriate action to maintain separation and prevent conflict
Maintains situational awareness for persons/property on ground when BVLOS and takes appropriate action to maintain separation and prevent conflict
Correctly utilises airband radio to assist in separation when BVLOS
Utilises crew effectively when BVLOS

Schedule 3 – BVLOS Observer Training

Beyond visual line of sight trained observer - syllabus of training

1 Unit description

This unit describes the skills and knowledge required to operate as a BVLOS observer on company BVLOS operations.

2 BVLOS Observer Theory

(a) Duties of BVLOS trained observers

(b) Communication protocols while BVLOS

(c) Observer role in emergency response

(d) BVLOS approval details

(e) Operation and limitations of digital flight information system

(f) Operation and limitations of live video data for risk avoidance

(g) Human factors relating to sighting air and ground traffic

(h) Wind drift on GPS loss

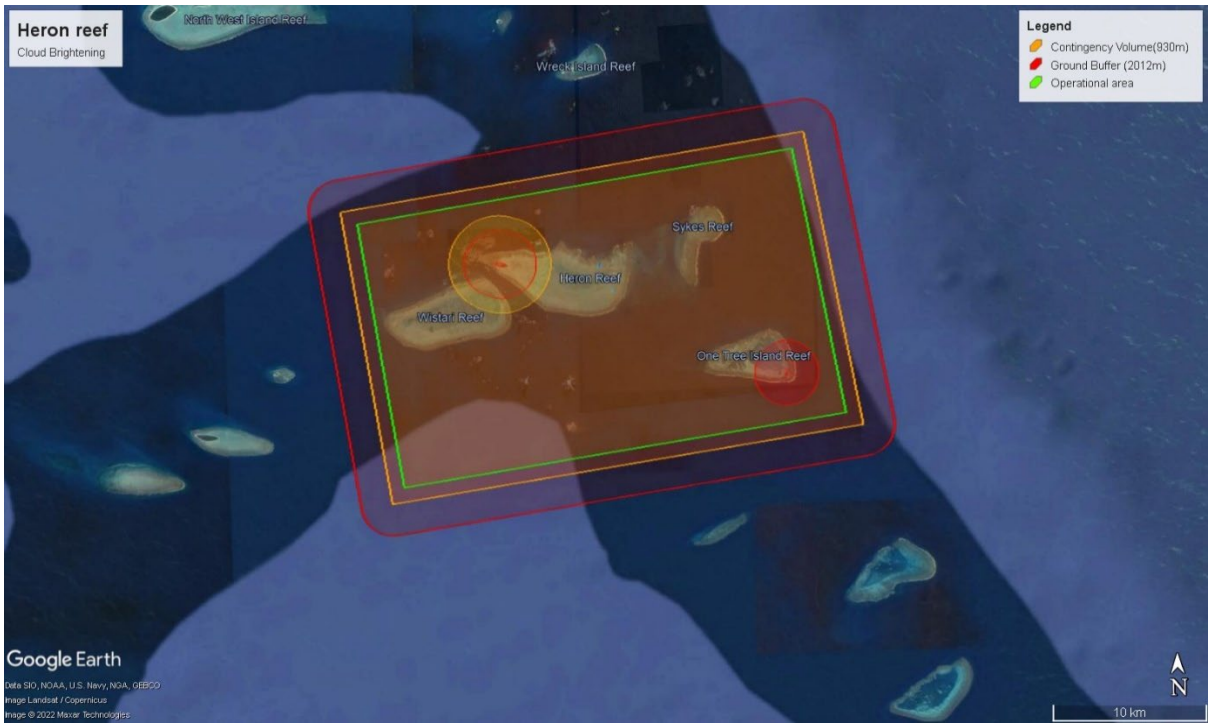
Schedule 4 – Register of BVLOS Trained Observers

Observer Name	Date of Training Completion	Signature of Chief Remote Pilot

Schedule 5 – Location specific procedures

1. Heron Reef, QLD

1.1 Operational Area



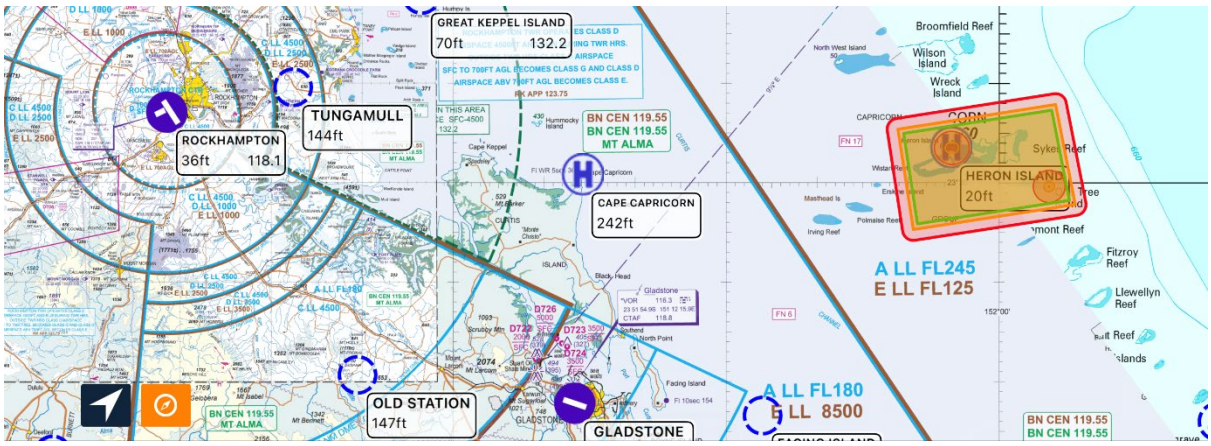
Heron Reef buffered.kml

1.2 Contingency Volume

A 930m contingency volume surrounds the Flight Geography. Should the RPA enter the contingency volume for any reason when BVLOS the Remote Pilot shall take immediate action to recover the aircraft (preferred) or land the aircraft safely within the area.

Should the aircraft escape the contingency zone immediate termination of the flight shall be carried out.

1.3 Airspace & Traffic



1.3.1 Nearby Airport / HLS / ALA

- Heron Island

1.3.2 Airspace

- Class G SFC – 12500

1.3.3 Radio frequencies

- FIA Brisbane Centre 119.55MHz
- Unicom 126.70MHz

1.3.4 Special air traffic

Reserved

1.3.5 Airspace Operational Requirements

In addition to any other requirements, before operations BVLOS:

- Remote Pilot to ensure RPA and manned aircraft are be separated by at least 500 ft (vertically) and 1500 m (horizontally) at all times.
- ADSB in to be utilised throughout operations to aid in situational awareness.

1.4 Ground Risk Mitigation

1.4.1 Ground Operational Requirements

Prior to commencement of BVLOS operations the Remote Pilot shall confirm location of any maritime traffic using ship radar and plan flight to avoid surface traffic.

A 1:1 ground buffer exists around one tree island where person not directly associated with the operation are located outside of a sheltered environment. Where persons not directly involved with the operation are inside of a sheltered environment the ground buffer does not apply.

A 1:1 ground buffer exists around all marine traffic.

1.5 Stakeholder Engagement

Prior to commencement of BVLOS operations stakeholder engagement (detailed in Schedule 7 to this Appendix shall be carried out with the following parties. Any issues identified in stakeholder engagement and the relevant remedies are to be detailed as part of the prefight briefing.

Air operators

1. Marine Helicopters – Heron Island transfers – Ph 07 4978 0129 Email operations@marinehelicopters.com https://www.heronislandhelicopters.com/

Maritime operators

1. Heron Islander – Heron Island Resort - Ph 1800 875 343 e: heronisland@aldestarreservations.com https://www.heronisland.com/

Other stakeholders

One Tree Island – University of Sydney - Ph 07 4972 9697, 07 4972 8531 Email science.onetree@sydney.edu.au https://www.sydney.edu.au/science/our-research/research-facilities/one-tree-island.html

Schedule 6 – Traffic Log

Date	Remote Pilot	Aircraft Registration	Aircraft Location & Altitude	Aircraft tracking	Observation method (ADS-B, radio, visual)	Proximity to BVLOS RPA

Schedule 7 – BVLOS Stakeholder Engagement Plan

1. Summary

Where the Location Specific requirements (Schedule 5 of this Appendix) require stakeholder engagement the following procedure must be carried out prior to the commencement of BVLOS operations. This procedure is to reduce the potential for conflict with other airspace users by advising the potential users of the RPA operations and giving them an opportunity to provide feedback on operations procedures so that the Chief Remote Pilot can make any necessary adjustments to increase operational safety.

2. Minimum Requirements

BVLOS operations shall not be commenced until:

- the relevant stakeholder has been provided 14 days notice of the operations and has not provided an objection of relevant feedback;
- the relevant stakeholder has provided feedback notifying of no relevant safety issues; or
- the relevant stakeholder has provided feedback notifying of a relevant safety issue and the issue has been mitigated.

3. Type of Communications

Stakeholder communication is not considered complete until notice of the operations is provided in writing and the minimum response requirements detailed in section 2 have been fulfilled. Where initial engagement is carried out in person or by telephone, follow up by written communication shall be provided.

4. Conflict of Operations

In the event that a conflict of operations is found with aircraft or personnel on the ground through the stakeholder engagement plan, RPAS operations must yield to these activities to reduce operational risk as much as possible.

APPENDIX 3: Above 400ft Operations

Above 400ft AGL training and checking

Prior to commencement of above 400ft AGL operations, each Remote Pilot and required Observer, shall receive training in accordance with Schedule 1. The training shall be provided by the Chief Remote Pilot or suitably qualified person delegated by the Chief Remote Pilot (e.g. a Senior Base Pilot).

Prior to commencement of above 400ft AGL operations, each Observer shall receive training in accordance with Schedule 2. The training shall be provided by the Chief Remote Pilot or suitably qualified person delegated by the Chief Remote Pilot (e.g. a Senior Base Pilot).

Proficiency checks for operations above 400ft are to be conducted by the Chief Remote Pilot or suitably qualified person delegated by the Chief Remote Pilot (e.g. a Senior Base Pilot) every 12 months. Training and proficiency checks are to be recorded in Remote Pilot Training records located in Schedule 3.

Above 400ft AGL operational requirements

Operations above 400ft AGL are not to be undertaken

- if the Remote Pilot becomes aware of a piloted aircraft within 3 nautical miles of the operating area whose altitude would cause vertical separation between the aircraft and RPA to be less than 1000ft
- if aviation radio is not available
- if a NOTAM is not published advising airspace users of the operations (the Chief Remote Pilot is responsible for issuing a NOTAM

When operating in uncontrolled airspace radio broadcasts are to be made on the local aeronautical frequency at least 15 minutes prior to commencement of above 400ft operations and then at intervals not exceeding 15 minutes until completion of above 400ft operations.

In addition to the above, any location specific requirements detailed in Schedule 4 shall be complied with.

Where the location specific requirements require stakeholder engagement, the Chief Remote Pilot shall ensure that stakeholder engagement has been carried out in accordance with Schedule 5 prior to authorising the flight above 400ft AGL.

Maintaining VLOS when operating above 400ft AGL

When operating above 400ft AGL the Remote Pilot will need to alter the maximum distance the PRA is operated from the pilot based on aircraft height to maintain Visual Line of Sight. The higher the aircraft is operated, the further away the aircraft will be from the pilot at the same location.

Slant distance table

Horizontal Distance from Remote Pilot in Metres

Height in Feet	200	400	600	800	1000	1200	1400	1600	1800	2000
100	202	401	601	801	1000	1200	1400	1600	1800	2000
200	209	405	603	802	1002	1202	1401	1601	1801	2001
300	220	410	607	805	1004	1203	1403	1603	1802	2002
400	234	418	612	809	1007	1206	1405	1605	1804	2004
500	251	428	619	814	1012	1210	1408	1607	1806	2006
600	271	440	627	821	1017	1214	1412	1610	1809	2008
700	292	453	637	828	1023	1219	1416	1614	1813	2011
800	315	468	648	836	1029	1225	1421	1618	1816	2015
900	339	485	660	846	1037	1231	1427	1623	1821	2019
1000	365	503	673	856	1045	1238	1433	1629	1826	2023

Schedule 1: Remote Pilot Training – Above 400ft AGL

Knowledge requirements

The applicant must demonstrate his or her knowledge of the privileges and limitations of the approval and of the following topics to the Chief Remote Pilot or suitably qualified person delegated by the Chief Remote Pilot (e.g. a Senior Base Pilot):

(a) RPA requirements and performance limitations for above 400ft AGL operations.

(b) Describe the normal practices, procedures, including applicable regulations set out in the Part 101 MOS 2019 for above 400ft AGL operations.

(c) Weather considerations for operations above 400ft AGL.

(d) Knows the applicable definitions as they relate to above 400ft AGL operations as set out in the Part 101 MOS 2019.

(e) Describe the considerations and procedures for managing non-normal and emergency situations during an above 400ft AGL operation.

(f) Wind drift on GPS loss

(g) Describe the considerations for carrying out an above 400ft AGL flight at a controlled or non-controlled aerodrome (if applicable).

(h) Understands some of the visual illusions and human performance limitations that may eventuate during above 400ft AGL operations.

(i) Communication protocols and requirements during above 400ft AGL operations, including radio frequencies, broadcasting intervals and if present, Observer interactions.

(j) Communication procedures with the applicable Aerodome Reporting Officers and other stakeholders.

Schedule 2: Observer Training – Above 400ft AGL

Knowledge requirements

The applicant must demonstrate his or her knowledge of the privileges and limitations of the approval and of the following topics to the Chief Remote Pilot or suitably qualified person delegated by the Chief Remote Pilot (e.g. a Senior Base Pilot):

(i) Duties of above 400FT AGL operations for trained Observers

(j) Communication protocols and requirements during above 400ft AGL operations

(k) Observer role in emergency response

(l) Describe the normal practices, procedures, including applicable regulations set out in the Part 101 MOS 2019 for above 400ft AGL operations.

(m) Understands some of the visual illusions and human performance limitations that may eventuate during above 400ft AGL operations.

(n) Human factors relating to sighting air and ground traffic.

(o) Operation and limitations of digital flight information system

(p) Operation and limitations of live video data for risk avoidance

(q) Wind drift on GPS loss

(r) Weather considerations for operations above 400ft AGL

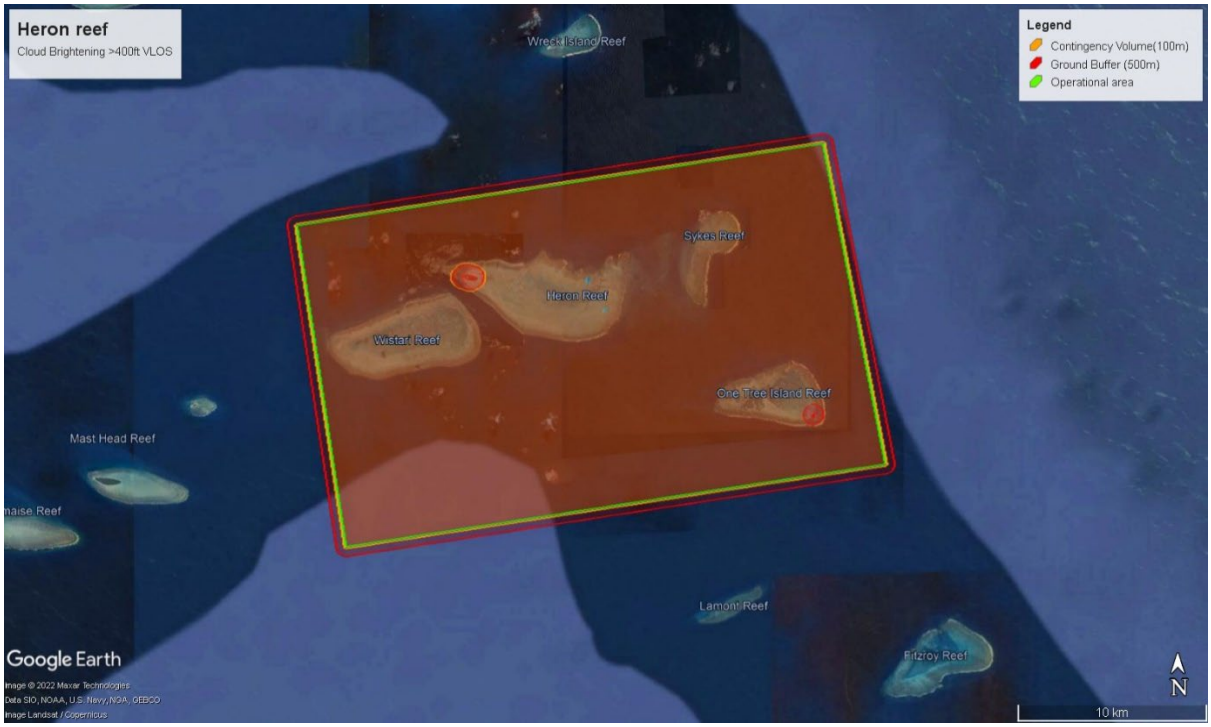
Schedule 3: Remote Pilot and Observer Training Record – Above 400ft AGL

Training events and proficiency checks conducted by the Chief Remote Pilot are to be recorded using this form. These may include induction training, type training, proficiency checks or specialised operations training.

Date	Name	Training type (Remote Pilot or Observer)	Chief Pilot Sign off

Schedule 4: Above 400ft operations – location specific procedures

Operational Area – Heron Reef



Heron Reef 400 buffered above 400.

Geo-fence

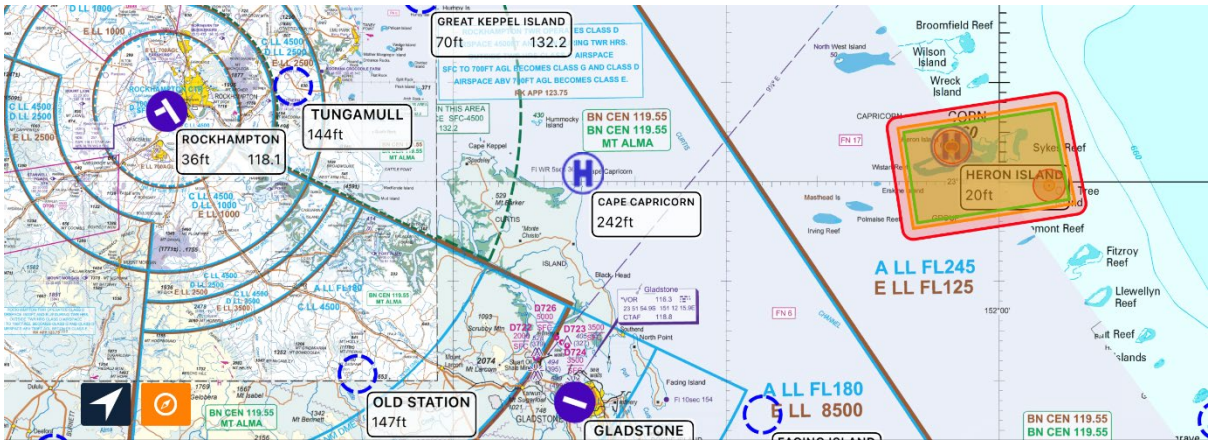
Prior to commencement of operations a vertical and horizontal geo-fence shall be activated (maximum flight distance and maximum height settings). The horizontal geo-fence shall be set to a maximum distance of as close as possible to the boundary of the operational area or anticipated Visual Line of Sight distance. The vertical geo-fence shall be set to a maximum of the specified AGL limit under the CASA instrument of approval.

Contingency Volume

A contingency zone of 100m laterally surrounds the operational volume. Should the RPA enter the contingency zone for any reason when above 400ft the Remote Pilot shall take immediate action to reduce the height of the aircraft to below 400ft AGL.

Should the aircraft escape the contingency zone while above 400ft AGL, an immediate termination of the flight shall be carried out.

Airspace & Traffic



Nearby Airport / HLS / ALA

Heron Island Heliport is within the operational volume

Airspace

Class G SFC – 12500

Radio frequencies

- FIA Brisbane Centre 119.55MHz
- Unicom 126.70MHz

Airspace Operational Requirements

In addition to any other requirements, before operations above 400ft:

- the Remote Pilot shall confirm that a NOTAM has been published notifying other airspace users of the operations and that the period and details of the published NOTAM covers the period and area of the proposed operations.

Ground Risk Mitigation

Ground Operational Requirements

Prior to commencement of above 400ft operations:

Non-operational personnel are confirmed to be outside of the ground buffer area. Should non-operational personnel be within the ground buffer, operations are limited to 400ft.

Stakeholder Engagement

Prior to commencement of above 400ft operations stakeholder engagement (detailed in Schedule 5 to this Appendix shall be carried out with the following parties. Any issues identified in stakeholder engagement and the relevant remedies are to be detailed as part of the prefight briefing.

Air operators

2. Marine Helicopters – Heron Island transfers – Ph 07 4978 0129 Email operations@marinehelicopters.com https://www.heronislandhelicopters.com/

Maritime operators

2. Heron Islander – Heron Island Resort - Ph 1800 875 343 e: heronisland@aldestarreservations.com https://www.heronisland.com/

Other stakeholders

One Tree Island – University of Sydney - Ph 07 4972 9697, 07 4972 8531 Email science.onetree@sydney.edu.au https://www.sydney.edu.au/science/our-research/research-facilities/one-tree-island.html

Schedule 5: Stakeholder Engagement Plan (above 400ft operations)

Summary

Where the Location Specific requirements (Appendix 14) require stakeholder engagement the following procedure must be carried out prior to the commencement of above 400ft operations. This procedure is to reduce the potential for conflict with other airspace users by advising the potential users of the RPA operations and giving them an opportunity to provide feedback on operations procedures so that the Chief Remote Pilot can make any necessary adjustments to increase operational safety.

Timing of Communications

Initial communication with stakeholders must be at least 14 days prior to time of intended operations.

Type of Communications

Initial communication with stakeholders must be via email, post or facsimile (template provided below). Follow up communication may be by any other means as determined appropriate by the Chief Remote Pilot and relevant stakeholder.

Sequence of Communications

Communications with stakeholders will be initiated with the stakeholder engagement email (or letter). This is to advise stakeholders of the general intention of operations, and to expect further communications prior to the commencement of above 400ft drone operations. Items that appear in *bold and italics* must be prepopulated.

Once operations have been approved by CASA, contacts and stakeholders will be contacted again to notify intention of operations and provide more specific details. This notification must be at least 2 days prior to the initial commencement of operations.

Conflict of Operations

In the event that a conflict of operations is found with aircraft or personnel on the ground through the stakeholder engagement plan, RPAS operations must yield to these activities to reduce operational risk as much as possible.

Updating contents of SEP

Where contacts provided through the SEP are found to be outdated or not representative of all affected parties, the Remote Pilot will report this to the Chief Remote Pilot. The Chief Remote Pilot will then update the SEP with additional contacts.

Stakeholder Engagement Email Template

To whom it may concern,

<Insert company name> is a Remote Operator Certificate holder operating drones throughout Australia on survey and inspection operations.

<Insert company name> is in the process of obtaining approval to operate drones up to XXXXft AGL in the areas depicted on the below chart. We understand that such operations are potentially in the vicinity of your aviation activities, and wish to engage all relevant stakeholders to ensure safe aviation activities within the area.

INSERT CHART/ OPERATIONAL AREA IMAGE

The operations are to be conducted between sunrise and sunset every day with individual flights not exceeding <Enter time> minutes.

A NOTAM will be issued once the approval is granted detailing the coordinates and heights of the operations.

Drone operations will only be conducted within Visual Line of Sight of the Remote Pilot.

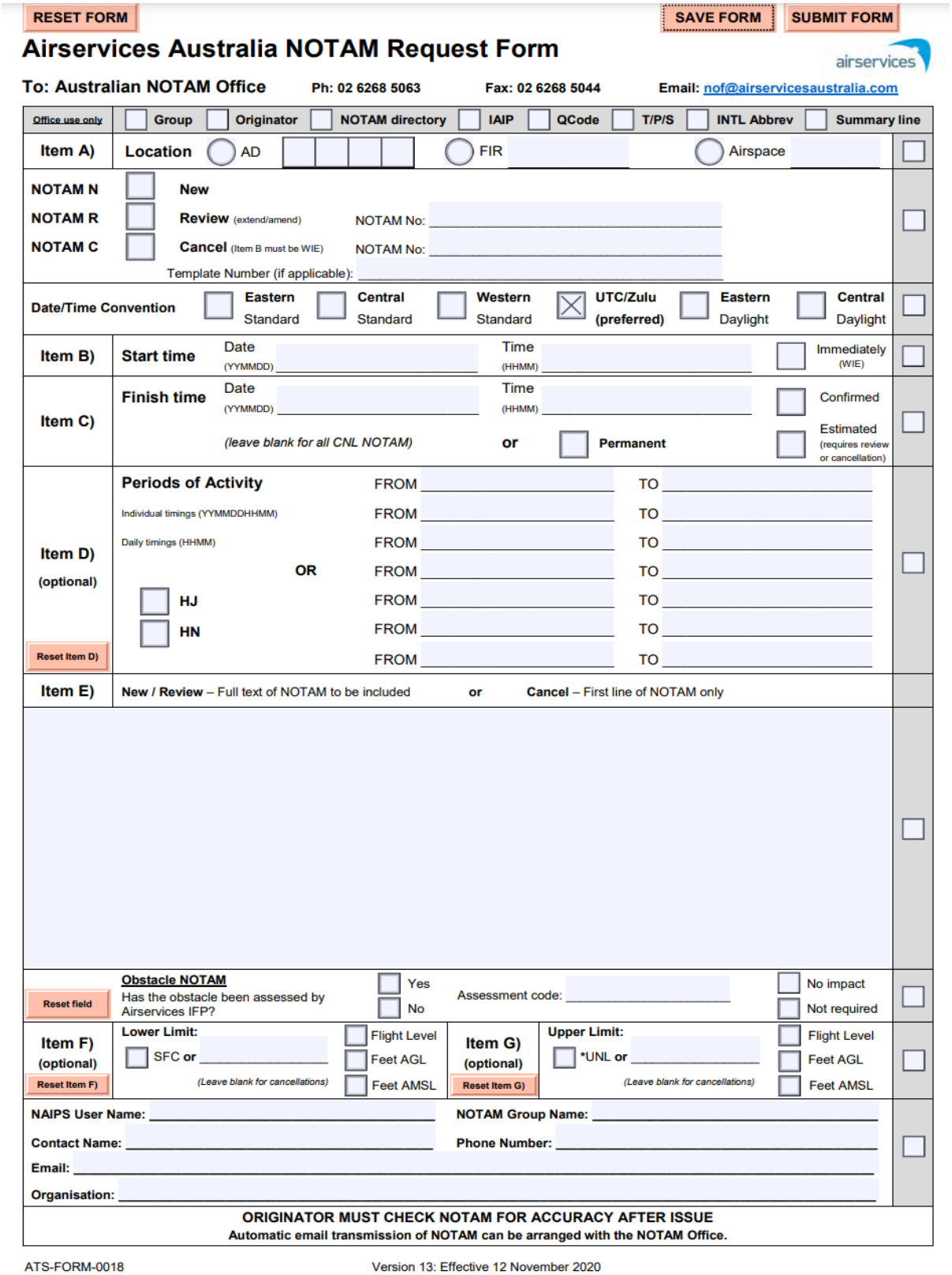
Remote Pilots will be in communication with the other aircraft using the relevant CTAF/UNICOM frequency.

If you could please via return email advise:

- *That your operating teams have been advised of the current and planned drone operations by "Insert company name"*
- *Any potential issues your organisation may see with the planned drone operations.*

Thank you for your time and we look forward to working closely with you to ensure the safety of future drone operations in the area.

Schedule 6: NOTAM Request Form



RESET FORM | SAVE FORM | SUBMIT FORM

Airservices Australia NOTAM Request Form

airservices

To: Australian NOTAM Office Ph: 02 6268 5063 Fax: 02 6268 5044 Email: nof@airservicesaustralia.com

Office use only	☐ Group ☐ Originator ☐ NOTAM directory ☐ IAIP ☐ QCode ☐ T/P/S ☐ INTL Abbrev ☐ Summary line
Item A)	**Location** ◯ AD ☐☐☐☐ ◯ FIR _____ ◯ Airspace _____ ☐
NOTAM N ☐ **New** **NOTAM R** ☐ **Review** (extend/amend) NOTAM No: _____ **NOTAM C** ☐ **Cancel** (Item B must be WIE) NOTAM No: _____ Template Number (if applicable): _____	☐
Date/Time Convention	☐ **Eastern** Standard ☐ **Central** Standard ☐ **Western** Standard ☒ **UTC/Zulu (preferred)** ☐ **Eastern** Daylight ☐ **Central** Daylight ☐
Item B)	**Start time** Date (YYMMDD) _____ Time (HHMM) _____ ☐ Immediately (WIE) ☐
Item C)	**Finish time** Date (YYMMDD) _____ Time (HHMM) _____ ☐ Confirmed ☐ Estimated (requires review or cancellation) *(leave blank for all CNL NOTAM)* **or** ☐ **Permanent** ☐
Item D) (optional) Reset Item D)	**Periods of Activity** Individual timings (YYMMDDHHMM) FROM _____ TO _____ Daily timings (HHMM) FROM _____ TO _____ **OR** FROM _____ TO _____ ☐ **HJ** FROM _____ TO _____ ☐ **HN** FROM _____ TO _____ FROM _____ TO _____ ☐
Item E)	**New / Review** – Full text of NOTAM to be included **or** **Cancel** – First line of NOTAM only
	☐
Reset field	**Obstacle NOTAM** Has the obstacle been assessed by Airservices IFP? ☐ Yes ☐ No Assessment code: _____ ☐ No impact ☐ Not required ☐
Item F) (optional) Reset Item F)	**Lower Limit:** ☐ SFC **or** _____ (Leave blank for cancellations) ☐ Flight Level ☐ Feet AGL ☐ Feet AMSL
Item G) (optional) Reset Item G)	**Upper Limit:** ☐ *UNL **or** _____ (Leave blank for cancellations) ☐ Flight Level ☐ Feet AGL ☐ Feet AMSL ☐
NAIPS User Name: _____ **NOTAM Group Name:** _____ **Contact Name:** _____ **Phone Number:** _____ **Email:** _____ **Organisation:** _____	☐

ORIGINATOR MUST CHECK NOTAM FOR ACCURACY AFTER ISSUE
Automatic email transmission of NOTAM can be arranged with the NOTAM Office.

ATS-FORM-0018 Version 13: Effective 12 November 2020

NOTAM Data Quality Requirements for Unmanned Aircraft Operators

C-MAN0284

Version 3

Effective 08 February 2021

Prepared:	Air Traffic Management Information Specialist
Endorsed:	AIS Quality & Service Improvement Mngr
Approved:	AIS

Ensure document is current before use

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