DRONE@UAV@UAS

SAFETY

CONTENTS

Check list……..

5. Operational envelope

1. Topcon Sirius Pro
2. Topcon Falcon 8

6. Check list

1. Pre site survey
2. Call Sheet
3. Risk assessment
4. On site survey
5. Embarkation
6. Arrival
7. Assembly and Pre flight
8. Post flight
9. Battery charge log book
10. Maintenance log book
11. Pilot and aircraft log book
12. Incident log book

LiPo battery safety ……

7. LiPo battery safety
8. Fail safe
9. Insurance for 3rd party liability

Fabian Lim

BNUC – S™ Qualified pilot

Topcon Sirius Pro

Topcon Falcon 8

Topcon Sirius Pro by MAVinci

Topcon Falcon 8 by Asctec

INTERNATIONAL CIVIL AVIATION ORGANIZATION

A United Nations Specialized Agency

INTERNATIONAL CIVIL AVIATION ORGANIZATION
A United Nations Specialized Agency

ICAO

Unmanned Aircraft Systems (UAS) in the first place in an aircraft, as such they are in principle subject to aviation rules in all domain (e.g. airworthiness,)

- the principal objective of the aviation regulatory framework is to achieve and maintain the highest possible and uniform level of safety.
- This policy states that **a civil** UAS must not increase the risk to people or property on the ground
- compared with manned aircraft of equivalent category.

Federal Aviation Administration - guidelines

- Follow community based safety guidelines as developed by organizations such as the Academy of Model Aeronautics
- Fly no higher than 400 feet and remain below any surrounding obstacles when possible
- Keep your sUAS in eyesight at all times and use an observer to assist if needed
- Remain well clear of and do not interfere with manned aircraft operations, and you must **see and avoid** other aircraft and obstacles at all times
- Do not intentionally fly over unprotected persons or moving vehicles and remain at least 25 feet away from individual and valuable property.

Federal Aviation Administration - guidelines

- Contact the airport or control tower before flying within five miles of an airport

- Do not fly near or over sensitive infrastructure or property such as power stations, water treatment facilities, correctional facilities, heavily traveled roadways, government facilities.

- Check and follow all local laws and ordinances before flying over private property

- Do not conduct surveillance or photograph persons in areas where there is an expectation of privacy without the individual's permission.


AUSTRALIA
Australian Government
Civil Aviation Safety Authority

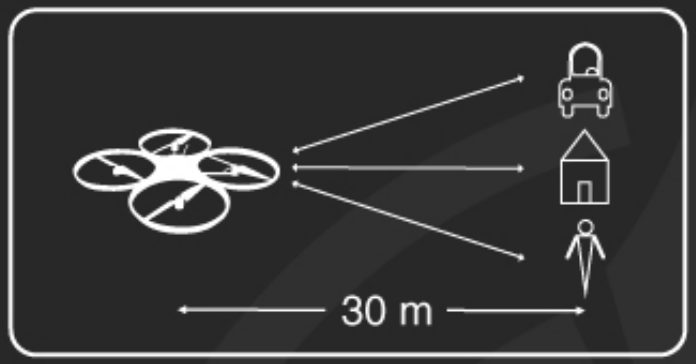
CASA

Civil Aviation Safety Authority (CASA) - Australia


$$$$
!
IT IS ILLEGAL to fly a
DRONE/UAV/RPA for money or economic gain
unless you have an
Unmanned Operator's Certificate issued by the
Civil Aviation Safety Authority (CASA)
IMPORTANT SAFETY INFORMATION

IMPORTANT SAFETY INFORMATION

HOW CLOSE?

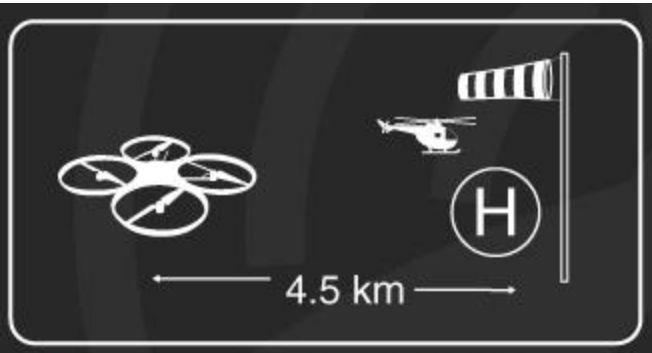


DO NOT fly closer than 30 metres to vehicles, boats, buildings or people

WHERE?

DO NOT fly over any populated areas such as beaches, other people's backyards, heavily populated parks or sports ovals where there is a game in progress

AIRFIELDS



DO NOT operate within 3nm or 4.5km of an aerodrome or helicopter landing site without approval

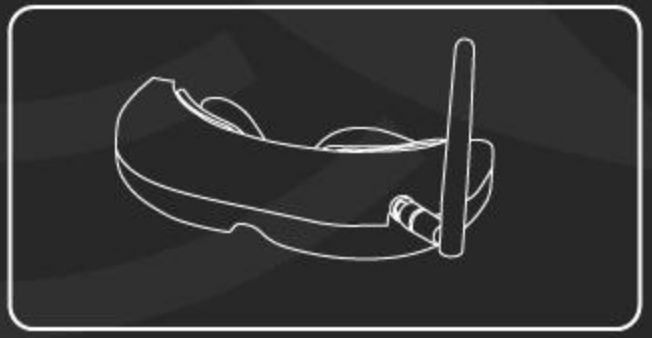
VISIBILITY

ONLY operate your RPA during daylight, good weather and in Visual-Line-of-Sight

HOW HIGH?

DO NOT fly above 400ft

FPV



FPV Flying may be illegal without an Advanced Amateur Radio License

www.rpastraining.com.au
info@rpastraining.com.au
1300 772 787

RPAS TRAINING & SOLUTIONS

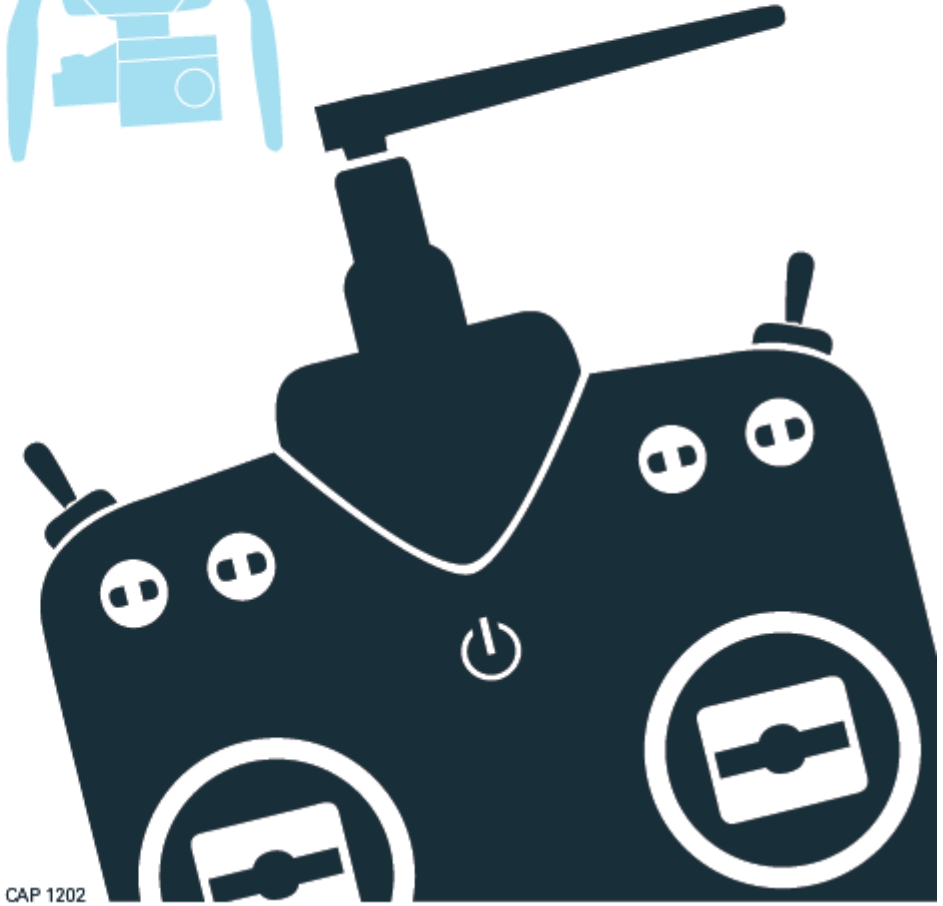
Civil Aviation Authority

You have control

Remember, when you fly an unmanned aircraft (or drone), the responsibility is yours.

Be safe, be legal

www.caa.co.uk/uas



CAP 1202

Always remember:

You are responsible for each flight

You are legally responsible for the safe conduct of each flight.

Take time to understand the rules - failure to comply could lead to a **criminal prosecution.**

Keep your distance

It is illegal to fly your unmanned aircraft over a congested area (streets, towns and cities).

Also, stay well clear of airports and airfields.

BEFORE each flight, check drone for damage

Before each flight check that your unmanned aircraft is not damaged, and that all components are working in accordance with the **Supplier's User Manual.**

Keep your distance 50 metres

Don't fly your unmanned aircraft within 50m of a person, vehicle, building or structure, or overhead groups of people at any height.

Drone is in sight at all times

You must keep the unmanned aircraft within your sight at all times.

Consider rights of privacy

Think about what you do with any images you obtain as you may breach privacy laws. Details are available from the Information Commissioner's Office.

YOU are responsible for avoiding collisions

You are responsible for avoiding collisions with other people or objects - including aircraft.

Do not fly your unmanned aircraft in any way that could endanger people or property.

Permission to use drones for paid work

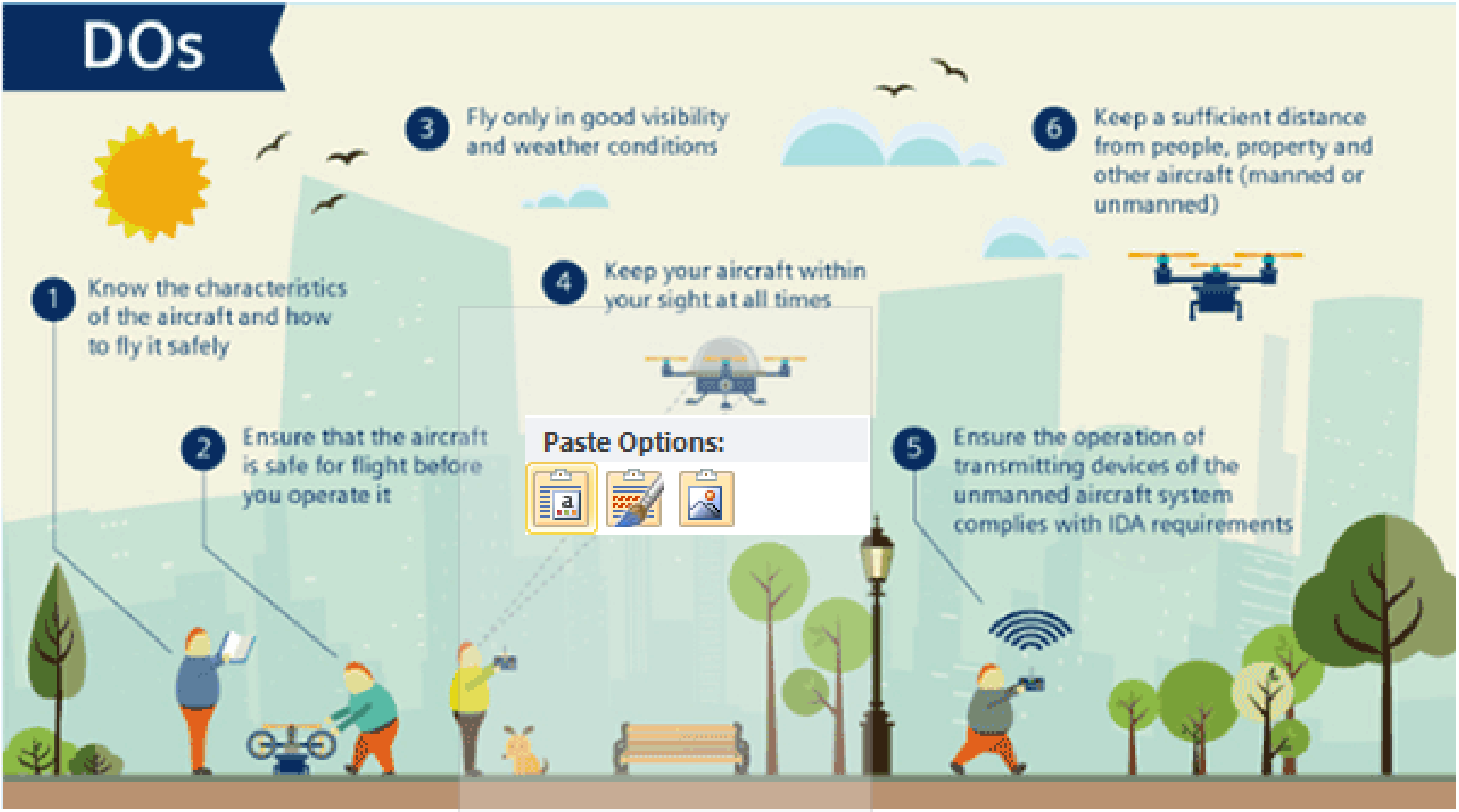
If you intend to use an unmanned aircraft for any kind of commercial activity, you must get a 'Permission' from the Civil Aviation Authority, or you could face prosecution. For more details, visit www.caa.co.uk/uas

Drone flying – A short Guide – CAA UK

SINGAPORE

CAAS

(CIVIL AVIATION AUTHORITY SINGAPORE)


DOs
1 Know the characteristics of the aircraft and how to fly it safely
2 Ensure that the aircraft is safe for flight before you operate it
3 Fly only in good visibility and weather conditions
4 Keep your aircraft within your sight at all times
5 Ensure the operation of transmitting devices of the unmanned aircraft system complies with IDA requirements
6 Keep a sufficient distance from people, property and other aircraft (manned or unmanned)
Paste Options:

DON'Ts


1 Don't fly the aircraft over any crowd
2 Don't fly an aircraft weighing more than 7kg (in total)
3 Don't suspend, carry or attach any item to the aircraft, unless it is manufactured to hold the item
4 Don't carry hazardous substances using the aircraft
5 Don't drop or discharge any item or substance from the aircraft
6 Don't fly where you may interfere with emergency service providers; or over moving vehicles where you can endanger or distract drivers
7 Don't fly the aircraft over or within restricted, prohibited or danger areas, including security-sensitive locations
8 Don't fly within 5km of any airport/military airbase, or higher than 200 feet

AUVSI – Association of Unmanned Vehicle Systems International

KNOW BEFORE YOU FLY

European Aviation Safety Agency

UAS
Safe to be flown
And Flown safely

https://www.youtube.com/watch?v=5Xs_eVx4nuw/

https://youtu.be/5Xs_eVx4nuw


EASA
European Aviation Safety Agency
Flying a Drone
Have fun | Be responsible for safety
DO
Keep your drone in sight at all times
Check your drone before each flight, plan your flight and learn from others
Read the manufacturer's instructions carefully
Keep way from airports and helipads
Remember you are responsible for avoiding collisions
You must have permission to do paid work with your drone
DO NOT
Do NOT fly in any way that could endanger anyone
Choose an unobstructed site and:
Do NOT fly overhead people, property or vehicles
Do NOT fly within 50 meters of people, property or vehicles
Do NOT fly higher than 150 meters from the ground
150m
Do NOT fly near aeroplanes or helicopters
http://easa.europa.eu/drones
Please don't forget to consult your national rules

HUMAN FACTOR

Human Factors

- **Lack of standard training procedure (requires regulatory attentions)**.
  - **Safety dictates 2 primary requirements**
    - Must be proficient in controlling the aircraft.
    - Interacting with other assets in the airspace.
  - **This highlight the need for appropriate automation and ground training**.
    - So pilot can safely avoid mid air and ground impact.
    - Potential impact of ground can be equally dangerous as mid- air collision.
  - **Low altitude hazards**
    - Hazards are not limited to other craft
    - Above 150m there are few things to run into
    - Landing and takeoff and operating under 150m where many UAV are design to spend most of the flight time poses many hazard trees, buildings, wires etc.,
    - GPS could be blocked by trees buildings etc.

WEATHER

Weather

- Accurate weather information is critical to UAV flight planning.
  - Information on wind speed and direction, cloud ceiling, visibility, precipitation, humidity, temperature, atmospheric pressure and present weather (i.e. rain thunderstorms etc.) is crucial for flight plan preparation and execution
- Take off and Landing
  - In preparation for a landing, pilots need accurate information on wind speed and direction (especially runway cross-winds**)**.
  - 84% of UAS mishap occur during take off and landing.
- In Flight
  - UAS are sensitive to certain meteorological events such as surface/terrain-induced (boundary layer) winds, turbulence
  - UAV often fly at low altitude so they are directly affected by the weather.

TOPCON SIRIUS PRO - Operational Envelope		
1	MAXIMUM TAKE OFF MASS 2.8KG ?	
2	OPERATIONAL CEILING ≤ 10,000 FT AMSL	
3	MAXIMUM PERMISSIBLE AIRSPEED - 40 KNOTS	
4	OUTSIDE TEMPERATURE BETWEEN ≥ -5°C & ≤40° C	
5	MAXIMUM PERMISSIBLE WIND SPEED INCLUDING GUSTS - 35 KONTS (18 m/s)	

Topcon Falcon 8 - Operational Envelope		
1	MAXIMUM TAKE OFF MASS 2.2KG ?	
2	OPERATIONAL CEILING ≤ 10,000 FT ? AMSL	
3	MAXIMUM PERMISSIBLE AIRSPEED - 31 KNOTS	
4	OUTSIDE TEMPERATURE BETWEEN ≥ 0°C & ≤ 35° C	
5	MAXIMUM PERMISSIBLE WIND SPEED INCLUDING GUSTS - 29 KONTS (15 m/s)	
6	RAIN ? , SAND STORM ?	

PRE SITE SURVEY

JOB NUMBER	DATE

FLIGHT TEAM COMPOSITION	
PILOT IN COMMAND:	Fabian Lim
OBSERVER:	
UAV REGISTRATION:	2217 / 2218
PAYLOAD OPERATOR:	
SPOTTER:	

OPERATING SITE LOCATION		
OPERATING SITE NAME:		
SITE LATITUDE:		
SITE LONGITUDE:		
ALTITUTUDE AMSL:		ft AMSL
DATE WORK REQUIRED:	3rd May 2016	
DOWLOADED MAP TO GROUNDSTATION: (Tick)		X
IS THERE VEHICULAR ACCESS:	YES	NO
WORK REQUIRED:		

ITEM	ACTION TO COMPLETE	FINDINGS
AIRSPACE	Airspace Class? (A,C,D,E,F,G) - ATC Permission Required?	
TERRAIN	What is the Terrain? (Flat, Mountainous, Boggy)	
PROXIMITIES	Other Aircraft (Aerodromes, Heli Pads, Model Sites)	
HAZARDS	Live Firing, High Intensity Radio Transmissions, Gas Venting	
RESTRICTIONS	Nuclear Power Stations, Prisons, High Intensity Radio	
SENSITIVITIES	Nature Reserves, Recreational Areas, Bye Laws	
PEOPLE	Local Habitation (Do we need to Letter Drop?)	
LIVESTOCK	Local Farms	
PERMISSION	Local Authority, Land Owner, Military Space	
ACCESS	Public Right of Way, Gates & Roads	
CORDON	Is a Cordon Required? (Do we need extra staff?)	
FOOTPATHS	Public Footpaths, Bridal Paths	
ALTERNATE	Alternative Operational / Take Off Sites	
RISK MITIGATION	Can the job be done at another time to avoid School times etc	
WEATHER	24 hour forecast	
NOTAMS	Any Notice to Airmen that may effect operations	

COMPLETED PRE-NOTIFICATION	*If Notified, Record Date, Time & Contact Name*
LOCAL AIR TRAFFIC CONTROL:	
REGIONAL AIR TRAFFIC CONTROL:	
MILITARY CONTROL:	
NOTICE TO AIRMEN:	

CALL SHEET

JOB NUMBER	DATE

START TIME:	
LUNCH:	
FINISH TIME:	

WEATHER FORECAST	
WIND SPEED:	KNOTS
WIND DIRECTION:	
TEMPERATURE:	*C
HUMIDITY:	
CHANCE OF RAIN:	%
SUNRISE:	
SUNSET:	

ROLE	NAME	CONTACT NUMBER
PILOT IN COMMAND:		
OBSERVER:		
PAYLOAD OPERATOR:		
SPOTTER 1:		
SPOTTER 2:		
HELPER 1:		
HELPER 2:		
FIRST AIDER:		
ACCOUNTABLE MANAGER:		

SHOT NUMBER	DESCRIPTION OF WORK REQUIRED
SHOT 1	
SHOT 2	
SHOT 3	
SHOT 4	
SHOT 5	
SHOT 6	
SHOT 7	
SHOT 8	
SHOT 9	
SHOT 10	

NOTES:

RISK ASSESSMENT FORM

SITE LOCATION:		**JOB NUMBER: -**
FLIGHT OPERATION:		**JOB DATE:**
FLIGHT TEAM:	**PILOT-IN-COMMAND: Fabian Lim**	**OBSERVER:**
	PAYLOAD OPERATOR:	**AIRCRAFT: Topcon Sirius Pro & Topcon Falcon 8**

1 - HAZARD (Something with the potential to cause harm, how will it be realised and what is the potential injury?)	2 - AT RISK	3 - EXISTING CONTROL MEASURES	RISK 4 SEVERITY	RISK 5 PROBABILITY	RISK 6 RISK	7 - FURTHER CONTROL MEASURES	RISK 8 SEVERITY	RISK 9 PROBABILITY	RISK 10 RISK

FURTHER ACTIONS (Further control measures which could be implemented at the planning stage to improve safety)

ADDITIONAL COMMENTS (Actions identified by personnel on site, to make the operation safer)

AUTHORISED BY THE ACCOUNTABLE MANAGER	**NAME (Print):**	**SIGNED:**

AT RISK (Column 2)		SEVERITY (Column 4 and 8)		PROBABILITY (Column 5 and 9)	RISK RATING (Columns 6 and 10)		
E - Employees	1	NO INJURY, PROPERTY DAMAGE	1	EXTREMELY UNLIKELY	Severity X Probability - 1 to 5	MIN	Y - Acceptable Risk
C - Client	2	MINOR INJURY	2	REMOTE POSSIBILITY	Severity X Probability - 5 TO 10	LOW	Y - Acceptable Risk
V - Visitors	3	REPORTABLE INJURY	3	WILL POSSIBLY OCCUR	Severity X Probability - 12 TO 15	MED	? - Needs further consideration
P - Public	4	MAJOR INJURY OR FATALITIES	4	WILL PROBABLY OCCUR	Severity X Probability - 16 TO 20	HIGH	N - Unacceptable Risk
A - All			5	ALMOST CERTAIN			

ON SITE SURVEY

DATE	WIND SPEED
	KNOTS

JOB NUMBER:	
PILOT:	Fabian Lim
OBSERVER:	

TEMP.	DIRECTION
°C	

ITEM	ACTION TO COMPLETE	FINDINGS
OBSTRUCTIONS	Masts, Power Lines, Buildings, Train Tracks, Trees. Lakes, Rivers, Canals or Industrial Hazards	
VISUAL LIMITATIONS	Anything that May Impair Vision? (Up to 5KM)	
CORDON	Is a Cordon Required? (Do we need extra staff?)	
LIVESTOCK	Any Animals or Wildlife Present Nearby?	
TERRAIN	Flat Surface, Rough, Sloped, Wet, Trees?	
PERMISSION	Do We Have the Land Owners Permission?	Signature:
PUBLIC	Public Right of Way, Footpaths, Gates	
AIR TRAFFIC	Do We Need & or Have Clearance?	
COMMUNICATION	Are Two Way Radios Required?	
PROXIMITY	Are We Far Enough Away from Buildings?	
TAKE OFF AREA	Where is the Safest Convenient Position?	
LANDING AREA	Where is the Safest Convenient Position?	
OPERATIONAL ZONE	Are there Any Hazards or Obstructions?	
EMERGENCY AREA	Where is the Safest Convenient Position?	
PRESENCE OF TELECOMMUNICATION EQUIPMENT	Are there cell phone repeaters?, telecommunication towers?	

CONTACT NAME AND TELEPHONE NUMBERS	
PILOT:	Fabian Lim
OBSERVER:	
CLIENT:	
LOCAL POLICE:	
LOCAL HOSPITAL:	Queen's Hospital, Burton Upon Trent (Hospital) b. Tel: +44 128 356 6333
LOCAL AIR TRAFFIC CONTROL:	East Midlands Airport ATC Tel: +44 1332 852 993
EuroUSC: Cardinal Point, Park Road, Rickmansworth, Hertfordshire. WD3 1RE - Telephone: +44 (0) 203 005 5755	

NOTES:

Check list

EMBARKATION CHECKLIST - SIRIUS

ITEM	ACTION / CHECK	TICK
1	Carbon fiber tail strip are glued down, straight and not damaged	
2	Tail is straight and elapor is not damaged	
3	Tail plane connector plugs are taped down and pins are clean and straight	
4	Visually inspect cables on outside for cuts, wear etc. if tape is covering them, then they can be considered intact	
5	Black tape/vinyl on the bottom is in good condition	
6	Auto pilot board is not loose	
7	GPS receiver is not loose or damaged	
8	Active cooling system vents are not blocked or dirty	
9	Propeller blades move freely (can easily fold in) but not too loose	
10	Propeller and engine are not loose	
11	Visually inspect all cable, pins/connectors and wires for corrosion and damage	
12	Inspect battery leads and connectors	
13	Engine safety button is not loose and depresses properly	
14	Inspect all control surfaces (main wing, horizontal and vertical stabilizer) for cracks, damages and overall strength	
15	Inspect servos and connecting rods for damages and secureness	
16	Inspect internal plastic skeleton for cracks or damage	
17	Inspect all screw threads (inner and outer)	
18	Camera is secure, correctly position and all plugs are connected	
19	Check the date on the camera is correct	
20	All airframe cutouts are securely taped to the airframe	
22	Inspect airframe Elapor for damage, cracks and excessive wear	
23	Activate UAV, test engine and control surfaces for full and free movement, active cooling fan activates and deactivates	
24	Notebook, battery fully charged	
25	Power inverter	
26	Battery fully charged for power inverter	
27	Portable table	
28	Umbrella	
29	Windsock and 5m telescopic pole	
30	Anemometer, battery	
31	Tripod	
32	GPS antenna, tribrach and rod	
33	Hammer	
34	Sign board, safety tapes and cones	
35	Fluorescent Jacket(s) / Hard Hats	
36	GPS antenna, tribrach and rod	
37	First Aid Kit & Fire Extinguisher	
38	Spare SD card for camera	
39	Sissior, Pen Knife, Flat screw driver (large and small), velcro tapes	
40	Spare parts kit (refer to spare parts list for composition)	
41	File containing paper work (flying permit, insurance certificate, all checklist and manual)	
42	Pen and notepad	
43	Mobile phone battery full charge	
44	GPS tracker battery fully charge, SIM card inside tracker, tested	
45	4 batteries for SIRIUS fully charged	
46	Battery for the RC fully charged?	
47	Call sheet status	

ARRIVAL CHECKLIST

ITEM	ACTION / CHECK	TICK
SITE SURVEY	CARRY OUT SITE SURVEY WITH OBSERVER	
FLIGHT PLAN / BRIEF	CONFIRM FLIGHT PLAN & BRIEF CREW, OBSERVER & CLIENT	
CREW IDENTIFICATION BADGES	ISSUE AS REQUIRED	
HARD HAT / FLOURESCENT JACKETS	ISSUE AS REQUIRED	
TWO WAY RADIOS	ISSUE AS REQUIRED	
CORDON, SIGNS AND SAFETY TAPE	SETUP IF SURVEY FINDS REQUIREMENT	
CREW / HELPERS	POSITION AS REQUIRED TO MAINTAIN SAFE FLYING ZONE	
FIRST AID KIT	POSITION TO BE EASILY ACCESSIBLE & INFORM CREW OF LOCATION	
FIRE EXTINGUISHER	POSITION TO BE EASILY ACCESSIBLE & INFORM CREW OF LOCATION	
AIRFRAME	UNLOAD & CHECK AIRFRAME FOR ANY TRANSIT DAMAGE	
PAYLOAD	ATTATCH TO PLATFORM & FIT SAFETY LANYARD	
AUDIO VISUAL CONNECTION	INSERT A/V PLUG AND SECURE	
PROPELLERS	CHECK CONDITION (Splits, chips or cracks - Replace if Required)	
PROPELLER FIXINGS	CHECK SECURING NYLOCK NUTS FOR TIGHTNESS (Replace if Removed)	
CALIBRATION PLATFORM	POSITION AS REQUIRED & ENSURE LEVEL WITH SPIRIT LEVEL	
GROUND STATION	SETUP, SWITCH ON AND TEST OPERATION	
AUDIO VISUAL MONITOR	SETUP, SWITCH ON AND TEST OPERATION	

Note: The calibration platform displays a compass rose and should be positioned so that North is aligne

correctly. This compass rose can then be consulted in the event of a fly away action to ascertain

approximate heading quickly.

Check list

ASSEMBLY & PRE FLIGHT CHECKLIST SIRIUS

ITEM	ACTION / CHECK	TICK
ASSEMBLY		
1	Activate connector by connecting it to a battery. Connect GPS antenna cable and Radio antenna. Place it somewhere it has clear view to the sky and in every direction. Placing it on metal surfaces as a car could disturb radio links	
2	If you are using MAVinci Products out side of EU, the connector will have a transmission power of up to 1 W. For health reasons make sure that you have a distance of at least 3 m between you or other Humans and the MAVinci Connector or MAVinci Autopilot Antenna during normal operations	
3	Place the connector close to the PC (about 2 m).	
4	On rainy days: cover all front side openings of the UAV, also the Display. Do not cover the cooling openings of the engine! These are on the bottom side of the plane. Please make sure everything is dry, tape would not stick very well on wet surfaces.	
5	Also do not cover the can opening of the autopilot	
6	Connect the elevator and rudder of the plane and fasten with T-pices. To protect the propeller put the nose of the plane on your shoe or in the case. Over tightening of the screws will damage the foam, only tighten as much as necessary	
7	Connect the wings with the carbon fiber rod and fix it at the body with T-pieces. Over tightening of the screws will damage the foam, only tighten as much as necessary	
8	Center the wings. The gap should be fit in the middle.	
9	Connect the servo cables for aleriorns, raddar and elevator.	
10	Put the SD-Card in the plane. Make sure it is empty before…	
11	Insert the battery into the anterior plane chamber (WARNING: Do not connect). In the chamber cover it with tape	
12	Switch on the GPS tracker and insert into the plane, Test the GPS tracker by sending SMS to 00000POS. You will receive an SMS giving the location of the UAV	
13	Close the case of the UAV.	
14	Check the center of gravity of the aircraft by balancing it on two fingers, touching the wings on the marked spots. The aircraft should be balanced. The balance could be adjusted by moving the plane battery.	
15	Fix the cable in the engine compartment such that the cables would not enter the engine.	
16	Check that the the motor security lock is activated (elastic band).	
17	Place the UAV uncovered under the open sky in sufficient distance to cars, buildings etc., so that it has a good GPS signal reception. If possible in shadow.	
Establish Connection		
1	Switch RC to full manual mode	
2	Check that the throttle is zero (right handle of the remote control has to be in zero position: completely down)	
3	Switch on remote control	
4	Activate UAV by connecting it to it's battery	
5	Connect the laptop to Connector WIFI. Password ``mavinciconnector''	
6	Create new session or choose old (prepared) session in MAVinci Desktop	
7	The UAV with a customer specific name (e.g. ``Sirius'') appears in MAVinci Desktop in the ``List of recently recognized Devices'' (Welcome panel)	
8	If this does not happen check if you have a firewall that blocks the UAV signals and switch all firewalls off.	
9	Connect to the UAV in MAVinci Desktop	
10	Please note: The radio link is not stable on too small distances. Ensure connector and UAV has more than 3 m separation to have a good connection	
11	Send your flight plan to the UAV. Without a loaded flight plan the camera cannot be activated	
Pre-flight checks		
1	Remove lens cover	
2	Check the Compass: Near the magnetic poles problems with the compass can occur. Test it by rotating SIRIUS around all axis and check MAVinci Desktop show the correct orientation, pilot checks if the camera takes pictures by rolling the UAV to a Roll angle of 60°.	
3	Check the Rudder in all directions by using the RC: Move the rudders carefully in all directions: pitch elevator, side rudder, roll-aileron. Check the sense of the move direction.	
4	After a short time (max. 10 min) the UAV receives a good GPS signal and the UAV position is displayed in MAVinci Desktop	
5	If you do not see the UAV's position in MAVinci Desktop after 10 min disconnect the UAV from the battery, reconnect it again after a short waiting time and try the last steps again	
6	Check if GPS position of connector is correct	
7	Check if GPS position of plane is correct.	
8	Check that everything is ``green'' in the upper right corner of MAVinci Desktop. E.g. compass quality, RC-link, GPS statys ...	
9	Set the autopilot flight mode (click on ``Flight'')	
10	Switch the RC to Automatic and Autopilot mode	
11	Ensure the sky is clear and press the safety switch to turn on the engine. Listen for any unusual sound and launch against the wind. The engine can be disarm by simply pressing the safety switch.	

POST FLIGHT CHECKLIST-SIRIUS

ITEM	ACTION / CHECK	TICK
1	AFTER LANDING (INDEPENDENTLY FROM THE LANDING MODE), ALAWYS PRESS THE MOTOR SAFETY BUTTON TO DEACTIVATE THE MOTOR BEFORE LIFTING THE UAV OFF THE GROUND	
2	REMOVE THE UAV FROM THE LANDING SITE	
3	REMOVE THE SD CARD FROM THE CAMERA COMPARTMENT	
4	SWITCH THE RC TO MANUAL MODE WITH THE THROTTLE ALL THE WAY DOWN	
5	COPY THE PHOTO LOG. CLICK ON "FTP" IN THE PANEL SELECTOR. IN THE MAIN PANEL ON THE LEFT HAND SIDE YOU WILL SEE A LIST OF FILES ON YOUR COMPUTER AND ON THE RIGHT SIDE A LIST OF FILES IN THE "/logs/" folder on the UAV. REFRESH ON THE UAV LIST BY CLICKING ON REFRESH	
6	SELECT THE PHOTOLOGS (AND IF YOU LIKE THE FLIGHT LOGS) ONE BY ONE AND CLICK DOWNLOAD FOR EACH OF THEM	
7	IF DOWNLOAD FAILS RETRY.	
NOTE	THE RADIO LINK IS NOT STABLE ON TOO SMALL DISTANCES. TAKE CARE TO PREVENT CONNECTOR AND UAV HAS MORE THAN 3M SEPARATED TO HAVE A GOOD CONNECTION	
8	DISCONNECT THE BATTERY FROM THE UAV	
9	SWITCH OFF THE CONTROLLER	
10	DOWNLOAD THE AERIAL IMAGES WITH "GENERATE MATCHING" FUNCTION OF MAVinci DESKTOP	
11	AFTER DOWNLOADING ALL DATA DELETE THE IMAGES FROM THE SD CARD SO THAT THERE IS ENOUGH MEMORY CAPACITY FOR THE NEXT FLIGHT	
12	REPLACE THE SD CARD INTO THE CAMERA.	
13	INSPECT PROPELLER AND MOTOR. CHECK FOR DAMAGE AND ALLOWABLE MOVEMENT	
14	INSPECT MAIN WING FOR DAMAGE. CHECK IF IT IS STILL FIRM AND SECURE .	
15	CHECK TAIL COMPOMENT FOR DAMAGE. CHECK IF IT IS STILL FIRM AND SECURE .	
16	CHECK SERVOS AND COMPONENTS ARE SECURE AND FREE FROM DAMAGAE	
17	INSPECT WIRING AND CONNECTORS. SECURELY CONNECTED AND NO DAMAGE	
18	INSPECT UNDERCARRIAGE FOR DAMAGE. ENSURE TAPE IS STILL SECURE AND NOT TORN	
19	CHECK CAMERA IS SECURE AND POSITION CORRECTLY. CHECK LENS IS CLEAN AND NOT DAMAGE	
20	INSPECT AIRFRAME FOR ANY DAMAGE	

Check list

BATTERY CHARGE LOGBOOK-SIRIUS

BATTERY NUMBER	BATTERY RESIDUAL CHARGE %	DATE OF CHARGE	CHARGE INPUT mAh	PRE-FLIGHT BATTERY CHARGE %	NOTES

MAINTENANCE LOGBOOK-SIRIUS

DATE	REASON FOR MAINTENANCE	WORK COMPLETED	COMPLETED BY	PARTS REPLACED	TEST FLIGHT SIGNATURE	NOTES

Check list

COMBINED PILOT & AIRCRAFT HOURS LOGBOOK

Flight Number	Date (dd/mm/yy)	Take-Off Time (hh:mm)	Landing Time (hh:mm)	Flight Duration (hh:mm)	Aircraft Registration	Aircraft System Name	Battery Number	Pilot-in-Command	Observer Name	Payload Operator Name	Location Name	Latitude (dd°mm'ss")	Longitude (dd°mm'ss")	Purpose of Flight	Comments and Minor Incidents
1				0:00											
2				0:00											
3				0:00											
4				0:00											
5				0:00											
6				0:00											
7				0:00											
8				0:00											
9				0:00											
10				0:00											
11				0:00											
12				0:00											
13				0:00											
14				0:00											
15				0:00											
16				0:00											
17				0:00											
18				0:00											
19				0:00											
20				0:00											
21				0:00											

INCIDENT LOGBOOK

DATE	TIME	INJURIES / DAMAGE	INCIDENT DETAILS	ACTION TAKEN / INCIDENT REPORT	NOTES

Fail safe

- It is important that a pilot fully understand all the fail safe features.
- How it works and what it does.
- How to activate it.
- Understanding and lots of practice will make it second nature and pilot would not panic during emergency.
- Learn to fly in the different mode for fix wing aircraft
  - , Fully automatic, assisted mode and full manual mode
- Common fail safe features for **fix wing** include:-
  - Loss of GPS - Circle down after 5 sec
  - Loss of RC and Data link – return to home after 30 sec
  - Loss of RC link - ignore
  - Loss of Data link - ignore
  - Safety altitude – 50 M
  - Return to home – Return to starting position and circle or land automatically
  - Bounding box – geo-fencing

- Learn to fly in the different mode for multi rotor :-
  - Manual mode, Height mode and GPS mode
- Common fail safe features for multi rotor:-
  - Come home straight
  - Come home High
  - Direct landing
  - Loss of RC and Radio link
    - Return home and circle or land automatically
  - Motor failure
    - Return to home and land if one motor is down.

Insurance:-
especially 3rd party coverage

ALLIANZ GLOBAL CORPORATE & SPECIALTY – AVIATION

Allianz

Date Issued: March 31, 2016 Certificate No. 001

Certificate Holder: Toshiba Asia Pacific Pte Ltd.
20 Pasir Panjang Road, # 13-27/28
Mapletree Business City, Singapore 117439

Named Insured: Topcon Singapore Positioning Sales Pte. Ltd.
1 Jalan Kilang Timor # 09-01
Pacific Tech Centre, Singapore 159303

The above Named Insured is at this date insured with Allianz Global Risks US Insurance Company for the Limits of Coverage stated below:

Policy Numbers: A2PR000724716AM

Effective Dates: March 27, 2016 to April 1, 2017
Both at 12:01 A.M. local time at the Named Insured's mailing address shown above

AIRCRAFT PRODUCTS / COMPLETED OPERATIONS AND GROUNDING LIABILITY COVERAGE

	LIMITS OF LIABILITY	
	EACH OCCURRENCE	ANNUAL AGGREGATE
A) Bodily injury or Property Damage	$ 50,000,000	$ 150,000,000
B) Grounding	$ Not Covered	$ Not Covered
A) & B) Combined	Not Applicable	$ 150,000,000

In the event of cancellation of any policy described above, the insurer will attempt to mail 30 days (10 days for non-pay) written notice to the certificate holder prior to the effective date of cancellation. However, failure to do so will not impose duty or liability upon the insurer, its agents or representatives, nor will it delay cancellation.

This certificate or verification of insurance is not an insurance policy and does not amend, extend or alter the coverage and/or limits afforded by the policies listed herein. Notwithstanding any requirement, term or condition of any contract or other document, with respect to which this certificate or verification of insurance may be issued or may pertain, the insurance afforded by the policies described herein is subject to all terms, exclusions and conditions of such policies.

Issued by: Allianz Global Corporate & Specialty - Aviation
Aviation Operations
1 Progress Point Parkway
O'Fallon, MO 63368

Authorized Signature

5 P’s

PROPER

PLANNING

PREVENTS

POOR

PERFORMANCE

THANK YOU

1. Aspiring Model Actress
2. Wedding crasher