

Introducing Drones to Your Yacht Club

Droning in Annapolis

- Juliet Thompson – Race Officer and drone hobbyist (SSA)
- Tulinda Larsen – licensed Drone Operator (AYC)
- Carlos Linares – Technologist and drone hobbyist (SSA)

1. FAA Regulations, licensing and Insurance
2. Race Management Applications
3. Education and Safety
4. Entertainment and Publicity
5. Video presentation and IT
6. Policy Development
7. Future Directions
8. How to Fly a Drone

FAA Regulations Licensing Insurance

About me....

- Licensed Part 107 Remote Pilot in Command aka Drone Pilot
- Annapolis Yacht Club RC Drone Pilot
- Flew my Drone for RC 2017 Season
 - SAP 505Worlds
 - Ida Lewis Women Junior Double Handed
 - Opti Races
 - AYC Wednesday Night Races
 - J World
 - Severn Sailing Association
- CEO & Founder, Skylark Drone Research



What is a Drone?

- Unmanned Aerial Vehicle (UAV) or Unmanned Aerial Systems (UAS)
 - sUAS = small UAS <55 lbs ... all consumer drones
 - Nicknamed Drones because of the sound they make
- Military has been using drones for decades
- Miniaturization technology evolved in the early 2000s to enable the production of civilian Drones
- Drones are aircraft and regulated by the Federal Aviation Administration
 - Local government regulation of drones is a big issue in the industry
 - Privacy and viewed as a revenue opportunity for registration fees
 - Legally cannot shoot down aircraft in the US, hence can't shoot down drones



Milestones in Civilian Drones

This is a VERY New Industry

Congress mandated
FAA create rules for the
operation of drones

2012

FAA provided authorization for
film and TV production
companies for
Tom Cruise to star in
Top Gun 2 alongside drones

2014

FAA began
requiring small
drones to be
registered

2015

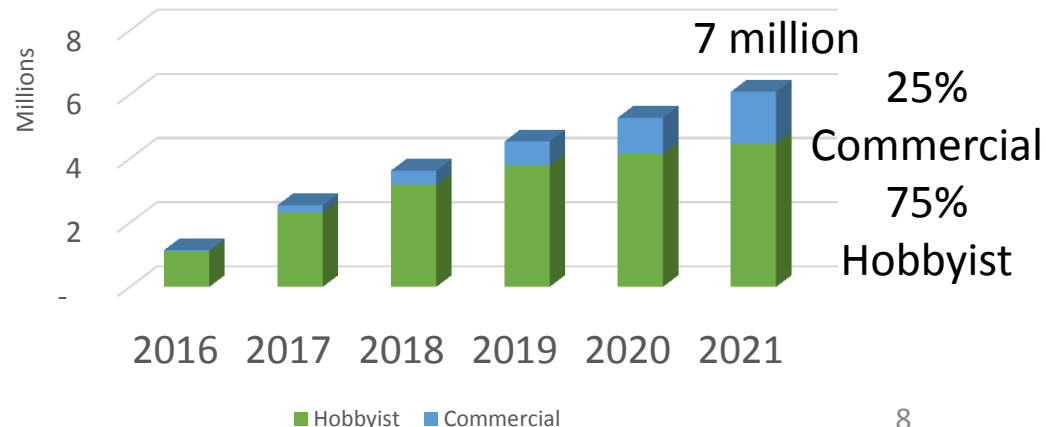
FAA rules regarding
hobbyists versus
commercial drone
operators went
into effect

2016

Today more than 1 million
drones are registered in the
U.S. Forecasts are for 7 million
by 2021

Compare to 250,000
manned aircraft in 100+
years of flight

sUAS Fleet in USA



Is Your Club Hobbyist or Commercial?

Hobbyist

“Flying for enjoyment, recreation, outside of work and not for work, business purposes, or for compensation or hire.”

Considered a model aircraft

Does not require a drone pilot license

EXAMPLES:

- A parent takes a video of junior sailing and shares with the kids
- Members fly their drones during races just for fun and share with friends

Commercial

“Flying for work, business, non-recreational reasons, or commercial gain.”

This typically includes flying a drone for hire, compensation, to provide a service, or for economic benefit of an entity or person. Intended use, not compensation, is the determining factor.

Considered FAA regulated aircraft operations under Part 107 and requires a licensed drone pilot

EXAMPLES:

- A coach, hired by the club, uses personal drone in junior sailing program
- Race Committee uses images from a drone for protest committee or Club uses race images for entertainment
- Club uses a member's drone images for promotion of activities

Licensing & Registration

Licensing – FAA Part 107 Rule

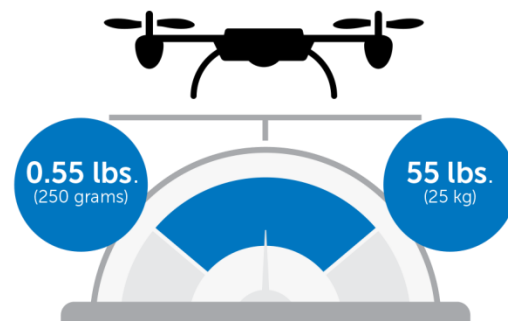
- If a drone is being flown as hobbyist, no licensing is required.
- If a drone is being flown commercially, under the FAA UAS Part 107 rule, the pilot must obtain a "Remote Pilot Airman Certificate" As of the end of 2017, there were 70,000 licensed, commercial drone pilots.
 - **FAA Remote Pilot Knowledge Test:** 60 question multiple-choice exam administered at FAA-approved knowledge testing centers; costs \$150
 - **Other requirements:** Pilot must be 16 years of age and must pass TSA security vetting. There is no practical testing of a pilot's operating skills.
- Penalty for not complying with rules is \$1,100 per violation for the pilot and \$11,000 for the organization



**Part
107**

Registration with FAA

- Federal law requires that ALL small unmanned aircraft (drones) weighing more than .55 pounds and less than 55 pounds be registered with the FAA
- Registration is required for both recreational and commercial use
 - Registration for hobbyist has been controversial, but Congress passed a law Dec 2017 requiring all drones to be registered under the National Defense Authorization Act
- Drones must be marked with the registration number



Insurance Requirements

There is no regulatory requirement for drone insurance



“Owned” Commercial Drone Insurance

- If your club buys a drone, most commercial General Liability policies **exclude** coverage for aviation (and drone) usage if the drone is **owned by the organization**.
- You organization will need to purchase Commercial Drone Liability Coverage for:
 1. Third Party Bodily Injury
 2. Property Damage to others
 3. Personal Injury (coverage for libel, slander, invasion of privacy, and copyright infringement)

“Non-Owned” Commercial Drone Insurance

- If your org contracts drone activities to an outside resource or club volunteer who owns the drone, then your organization needs to make sure that your **General Liability Policy includes liability coverage for "Non-Owned Aviation Usage."**
- You should require that the person/entity operating the drone for you meets the following standards:
 1. Part-107 license (Remote Pilot License/Certificate)
 2. Drone is registered with the FAA
 3. Carry adequate Drone Liability Insurance
 4. Provide Certificate of Insurance

Race Management Applications



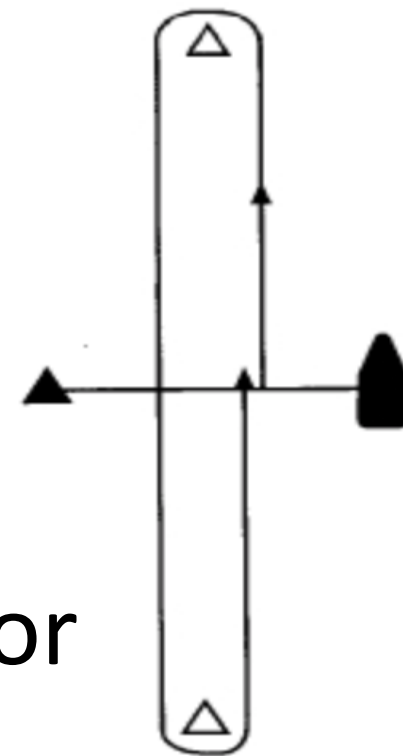
Types of racing determine whether
drone use is appropriate.

Types of Racing

- Short course dingy racing - TESODs, and weekend racing
- Wednesday Night racing - PHRF and one design rolling starts
- One design fleets
- Large one design championships

Tuesday Evening Summer One Design

- Short course
- Multiple starts
- Signal boat in middle
- Competitive sailing
- A lot of coaching taking place
 - competitor to competitor
 - RC to competitors
 - RC to RC



TESOD









Wednesday Night Races

- Drop and government marks
- 7 Rolling starts
- PHRF and one design
- Drone flying for T2P
- Exceptionally long starting line

J World Thursday Night Races

- Short course
- 2 one design fleets
- ~ 20 boats in each fleet
- 3 races
- Some behavior management issues



Large One Design Championships

- Long starting lines
- Difficulty identifying all boats OCS
- “congested” mark roundings



B4UFLY

Utilities



29

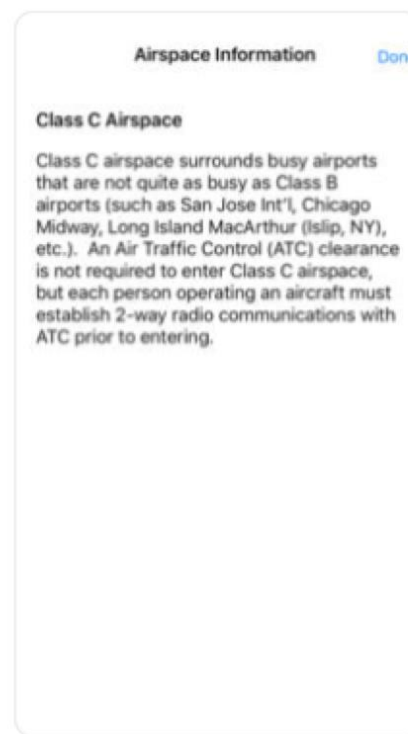
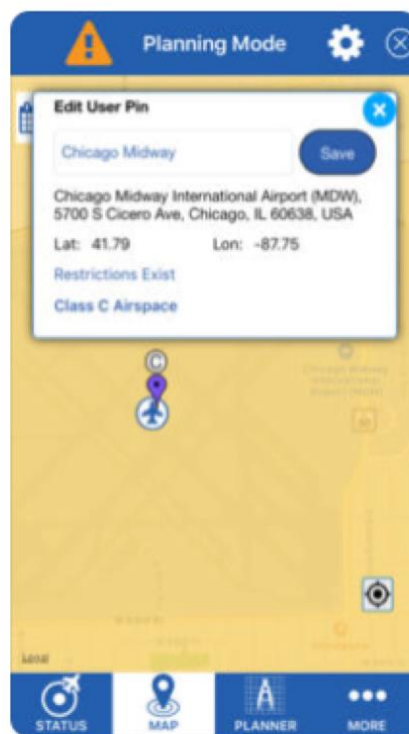
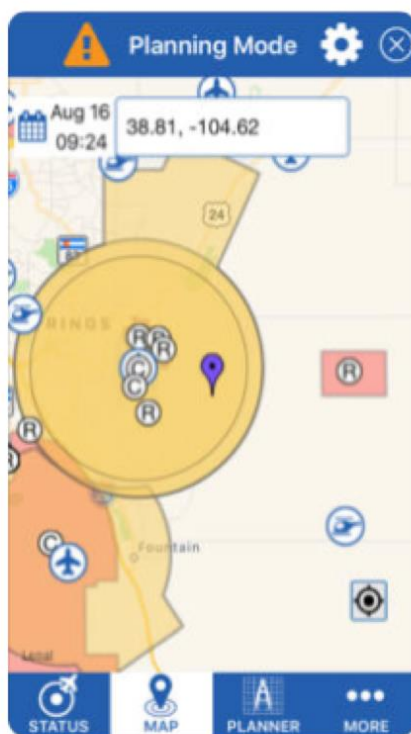


B4UFLY

Utilities

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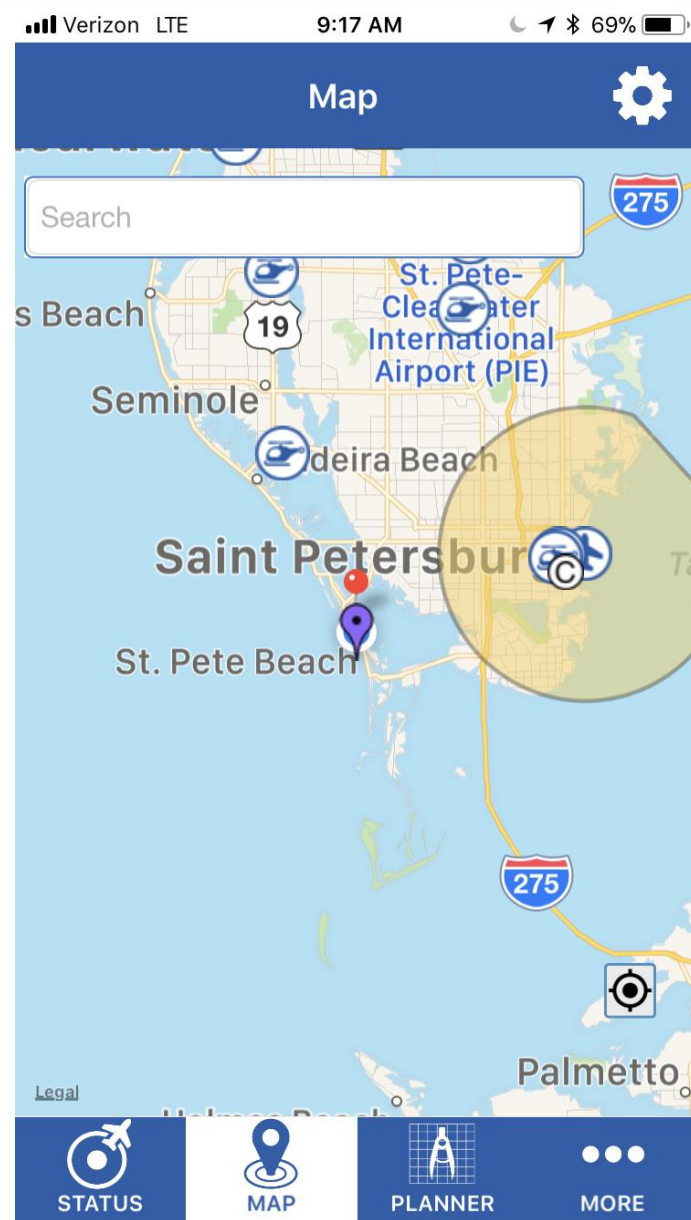
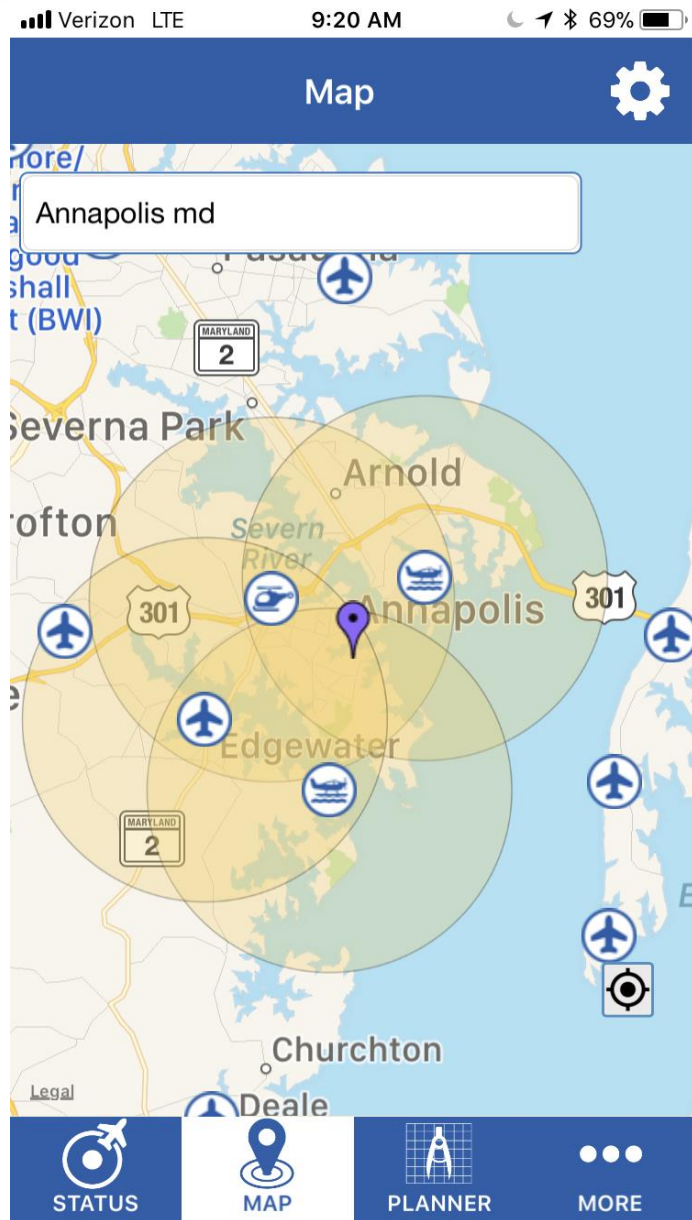
OPEN



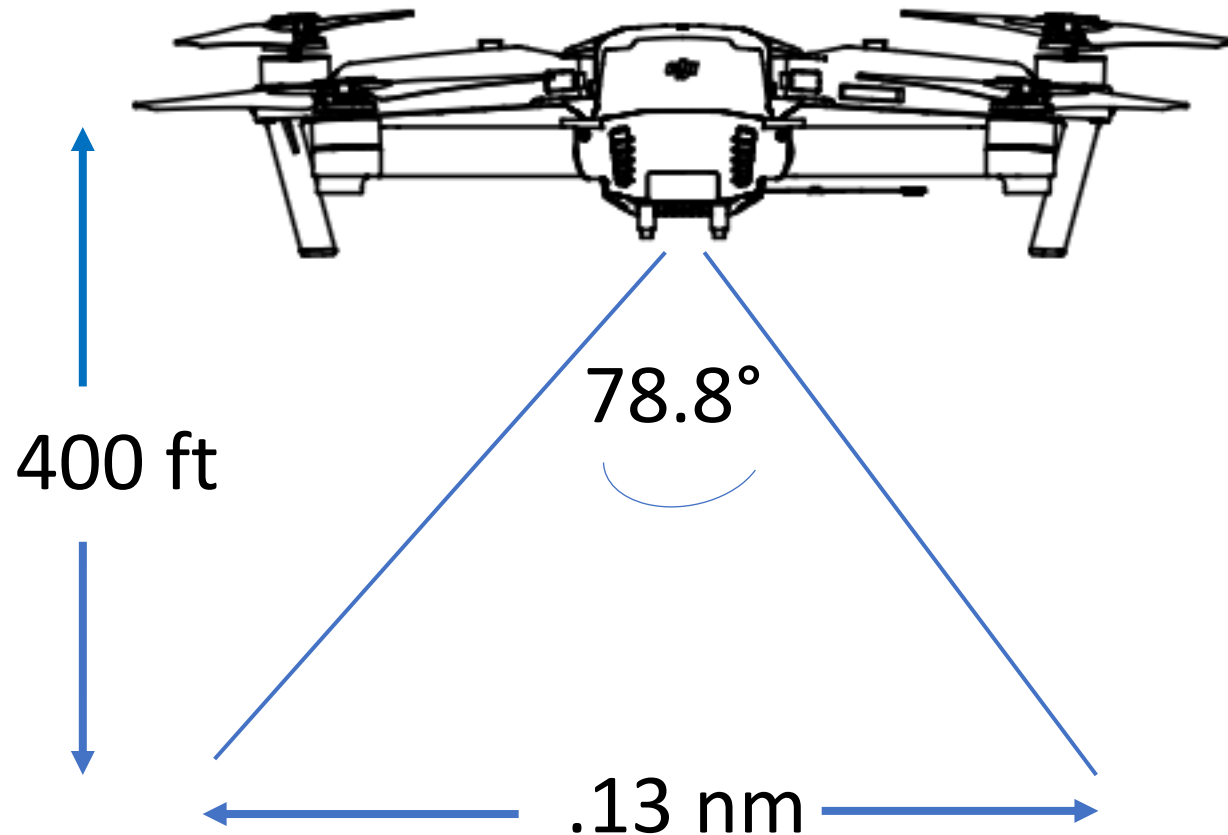


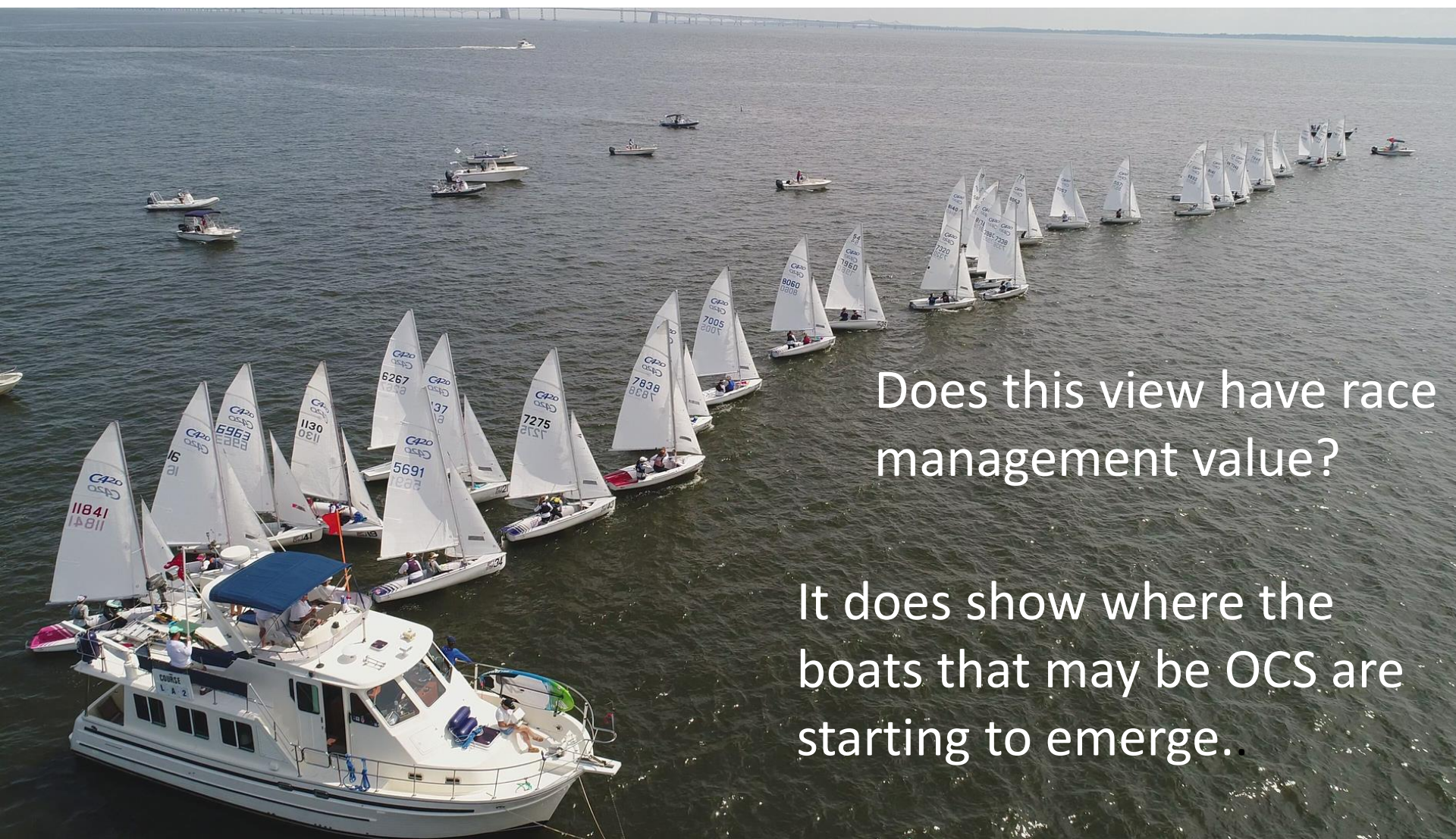
Drone Users

The FAA warns unauthorized drone operators that they may be subject to significant fines if they interfere with emergency response operations. Flying a drone without authorization in or near the disaster area may violate federal, state, or local laws and ordinances, even if a Temporary Flight Restriction (TFR) is not in place. Allow first responders to save lives and property without interference.



Field Of View





Does this view have race management value?

It does show where the boats that may be OCS are starting to emerge.





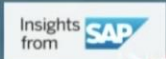
Entertainment and Publicity





Race 8 Leg 6

- 1 Matthew Barry / Thomas Barr...
- 2 Tyler Moore / Rob W... 132 m
- 3 Mike Martin / Adam ... 155 m



David Shelton
Ian Pinnell

Mike Martin
Adam Lowry




Matthew Bar.
Thomas Barr.


Wind
4.1 kts



Race 8

Leg 6

1	 Matthew Barry / Thomas Barr...	
2	 Tyler Moore / Rob W...	131 m
3	 Mike Martin / Adam ...	153 m

Insights from 







SWITCH TO CLUB

RACING | JJ GILTINAN | 18 FOOTERS TV | MERCHANDISE | OTHER NEWS | SPONSORS | GALLERIES

18 FOOTERS TV 2016-17

18 FootersTV - Live Stream

**Australian Championship
Race 3 & 4
Live Stream:
February 4, 2018
2:40pm AEDST**



RECORDED LIVE FROM SYDNEY HARBOUR



1:57 / 2:41



Policy Development

- This policy is to provide a starting point.
- It is expected to be revised as the FAA develops reasonable enforceable regulations



SSA Drone Policy & Application

1. Any drone operations on the race course must first be approved by a member of the standing race committee through this application process.
2. Any drone operator must have either approval or provisional approval.
3. Provisional approval is valid for six months. After six months of no reported issues the drone operator will automatically have full approval status.
4. An active member of the race committee may not operate a drone while performing race committee duties.
5. All equipment used including but not limited to drone, remote control, and receiver (cell phone etc) must be in top working order and fully charged.
6. Drones will never be launched if any error message is present.
7. Drones will only be launched if "GPS Ready" and "home" have been activated.
8. PRO must be notified prior to racing that a drone will be on the race course.
9. PRO should inform racers that a drone will be operating during racing.
10. All drones must be retrieved immediately when
 - a. five-minute battery alarm sounds.
 - b. Any kind of "error" or "disconnected" message appears.
 - c. Conditions become challenging such as wind gusts over 20 knots or temperature drops below 32.

Failure to comply with any of these rules could result in the elimination of approval status.

Drone Operator Approval

1. To become an approved SSA drone operator any individual must fill in an application and submit it to a member of the Standing Race Committee. A copy of the completed form will be given to the drone operator and be available on request. A scanned copy will be made available to the Standing Race Committee via group email.
2. Individuals must demonstrate a history of responsible behavior. Signatures from three members of SSA to confirm history of responsible behavior are needed.

Name:	Date:	Insurance (Company, Type):
Type of drone & Registration #:		Length of Drone experience:
SSA Member's signatures and printed name		
1	2	3
Describe drone expectations.		
Signature of Standing Race Committee Member		
Date Approved:		

Education and Safety



Safety

Future Directions

- Open up the discussion to more of the SSA community
- Build a collaborative drone team
- Include and encourage junior members
- Continue to be sensitive to the apprehension of some of the sailing community
- Make the sharing of video more accessible and timely through the SSA web site and other social media

Video Presentation and IT

Drone Video Editing

- Keep audience desires and interest in mind
- Keep it as short as possible
- Trim pieces of clips into a sequence
- Mix drone footage with camcorder/mobile footage
- Add titling (text on video), and other effects
- Can speed up smooth footage -cool hyperlapse
- Music!

Drone Video

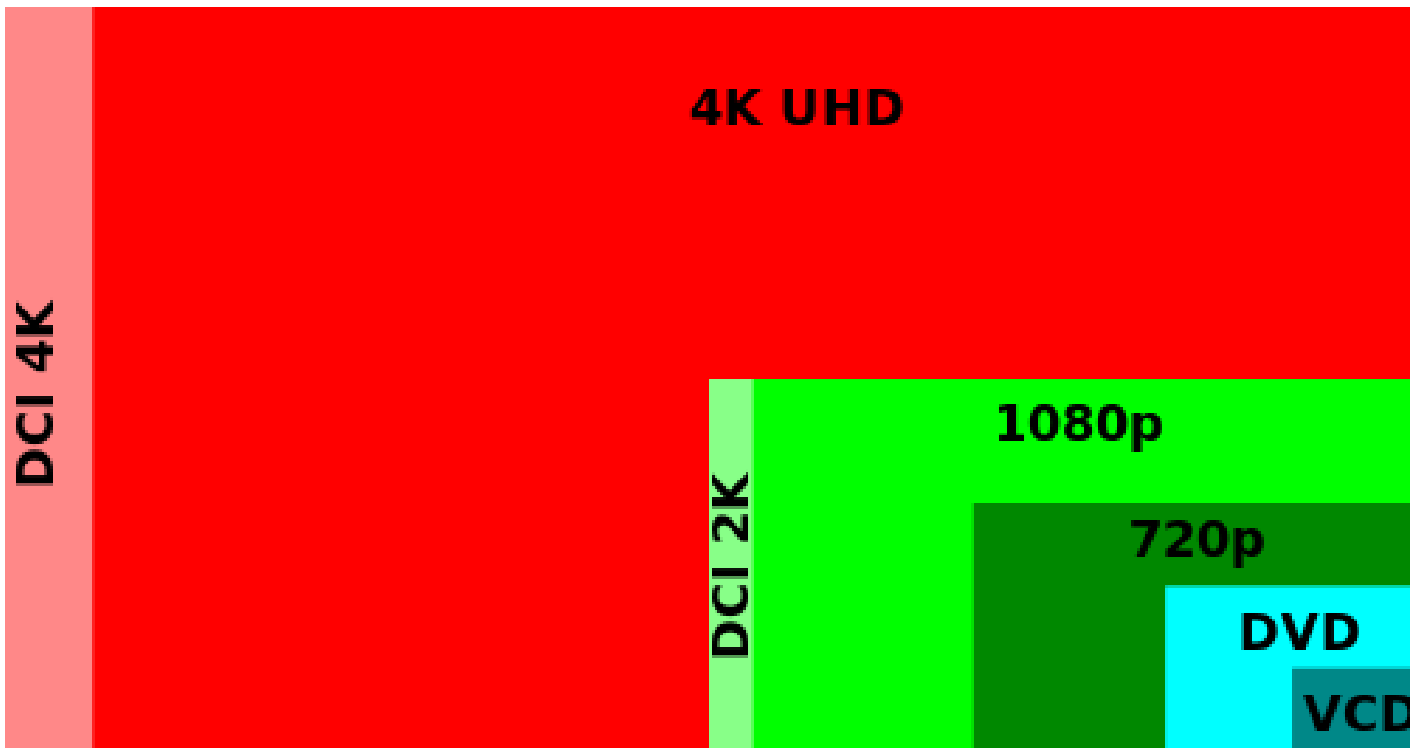
Capture video



Video editing

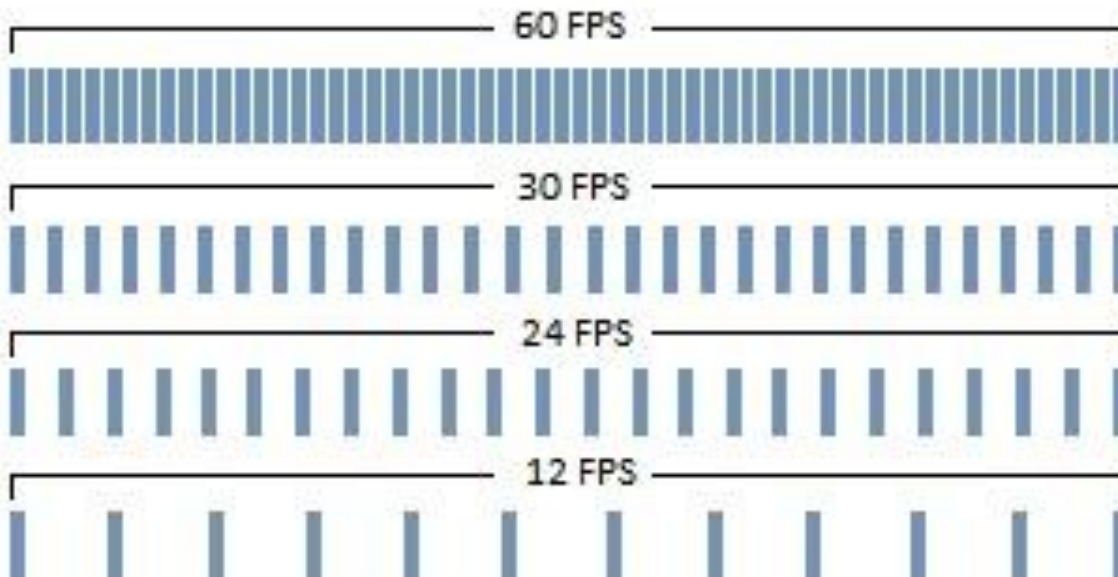
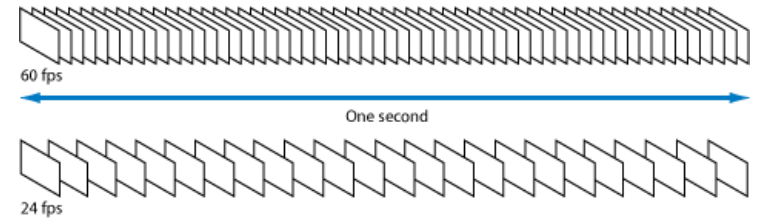


Video Format: Resolution

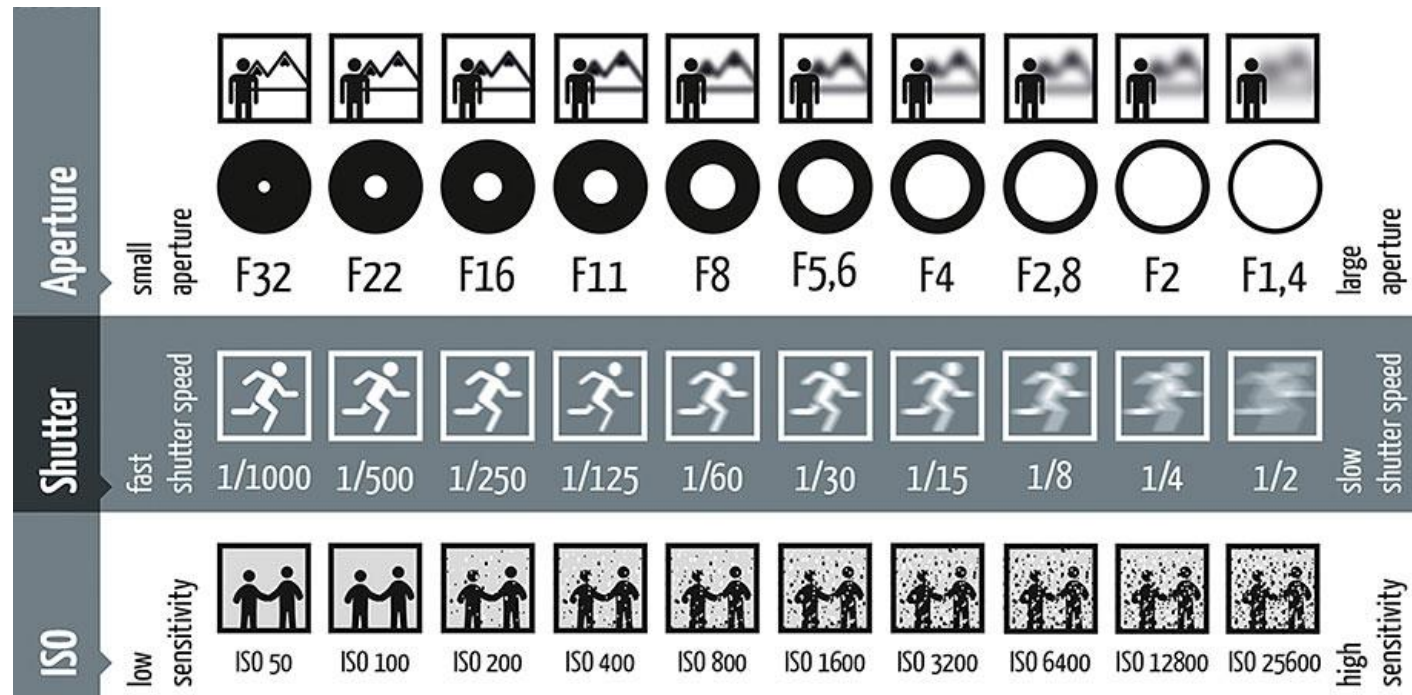


Video Format: Frame rate

1 Second of Animation



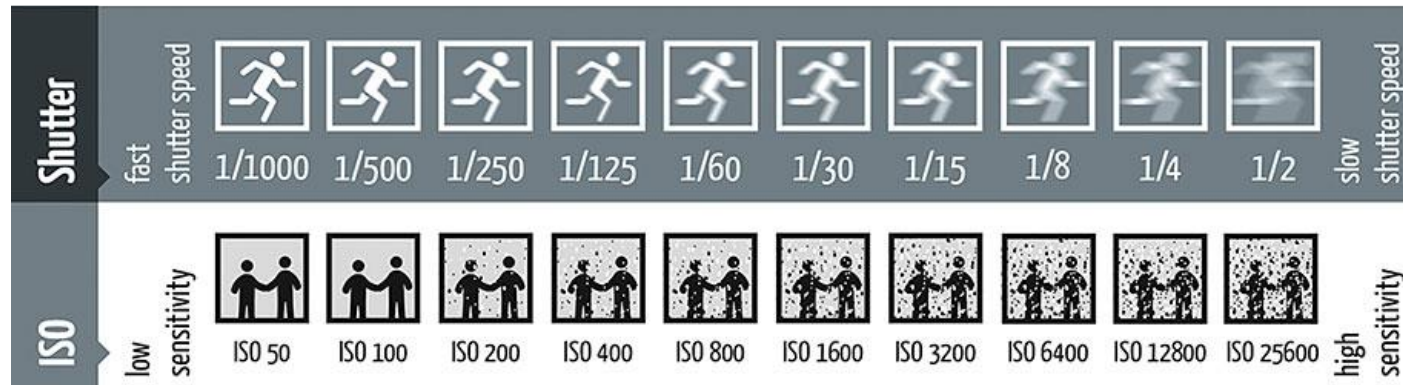
Exposure



Exposure

Fixed aperture on drones

ND Filters



Drone Video



- stored on microSD card in original quality
- stored in drone app on phone
 - lower quality video
 - audio from phone
 - DJI Go 4 makes autoedit videos with music



Drone Video



MicroSD card

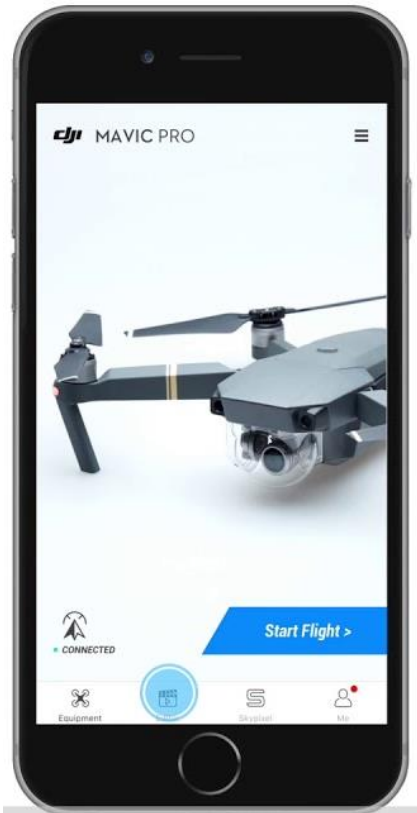


Video
editing





Drone Video



Edit and share
from your
phone



Drone Video

To see more drone videos,
visit me at: <https://vimeo.com/zenodux>



How to fly a drone



DJI Spark - \$500



DJI Mavic Pro - \$1000



DJI Phantom 4 - \$1500





Prepare for Takeoff



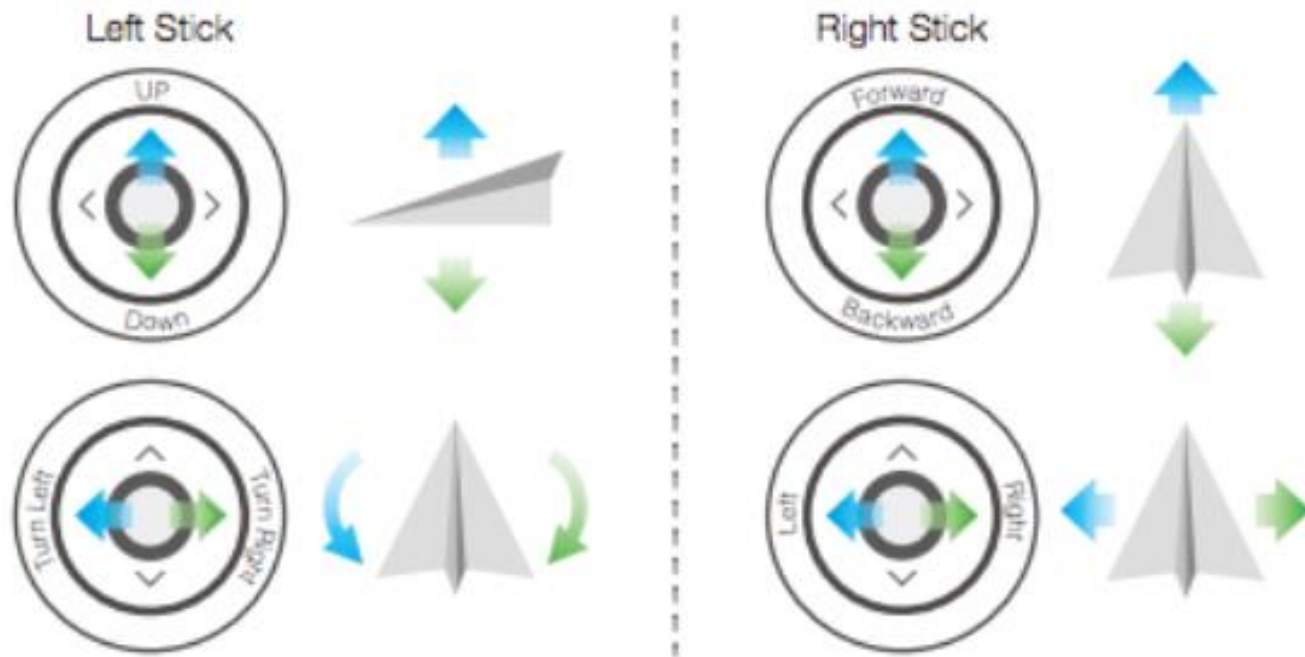
Power on the
remote controller

Power on the aircraft

Launch the DJI GO 4 app

Flight

The default flight control is known as Mode 2. The left stick controls the aircraft's altitude and heading, while the right stick controls its forward, backward, left and right movements. The gimbal dial controls the camera's tilt.



Before taking off, make sure the Aircraft Status Bar in the DJI GO 4 app or on the Remote Controller LCD screen displays 'Ready to Go'.

Ready to Go (GPS)

READY TO GO

Combination stick command to start/stop the motors



Left stick up (slowly) to take off

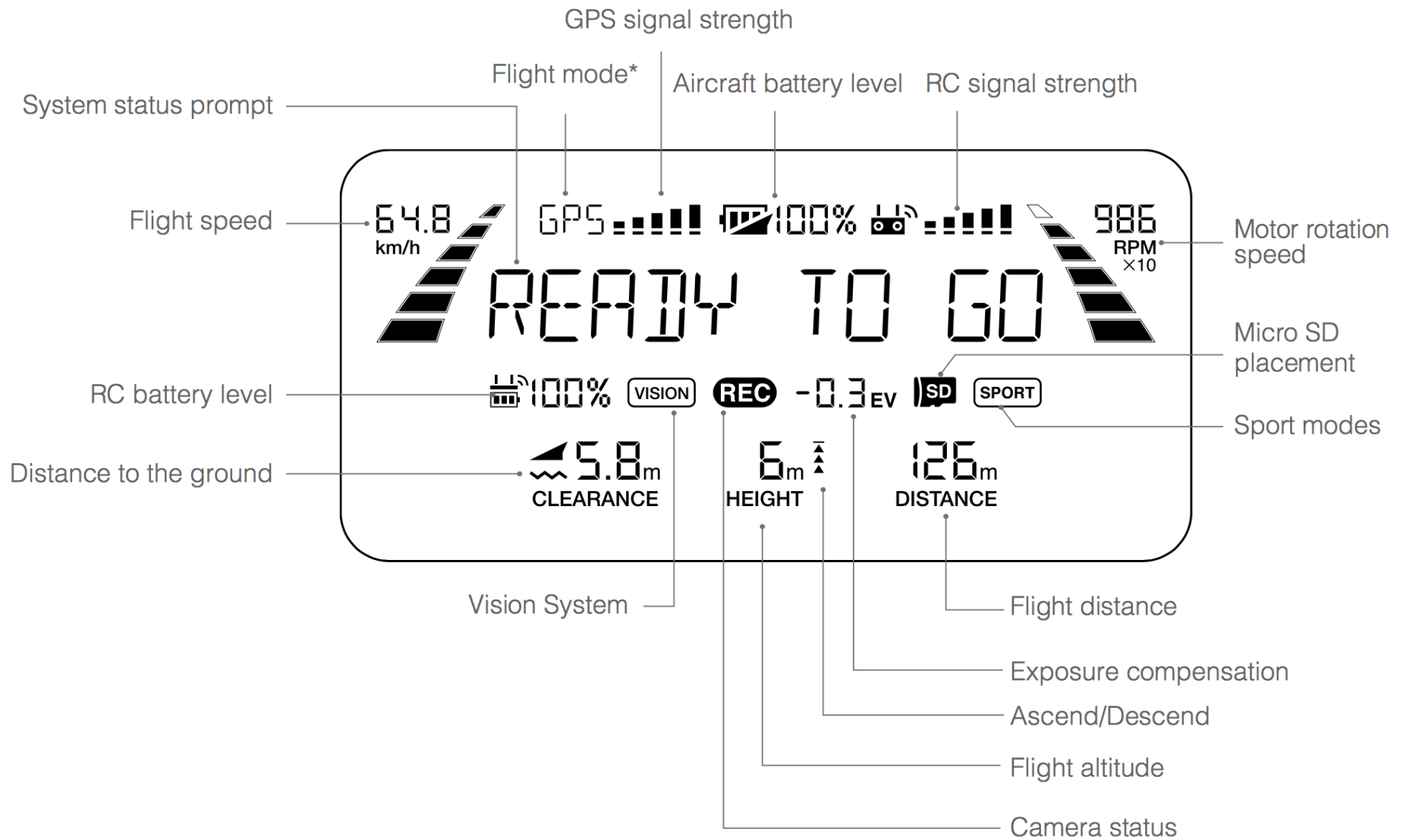


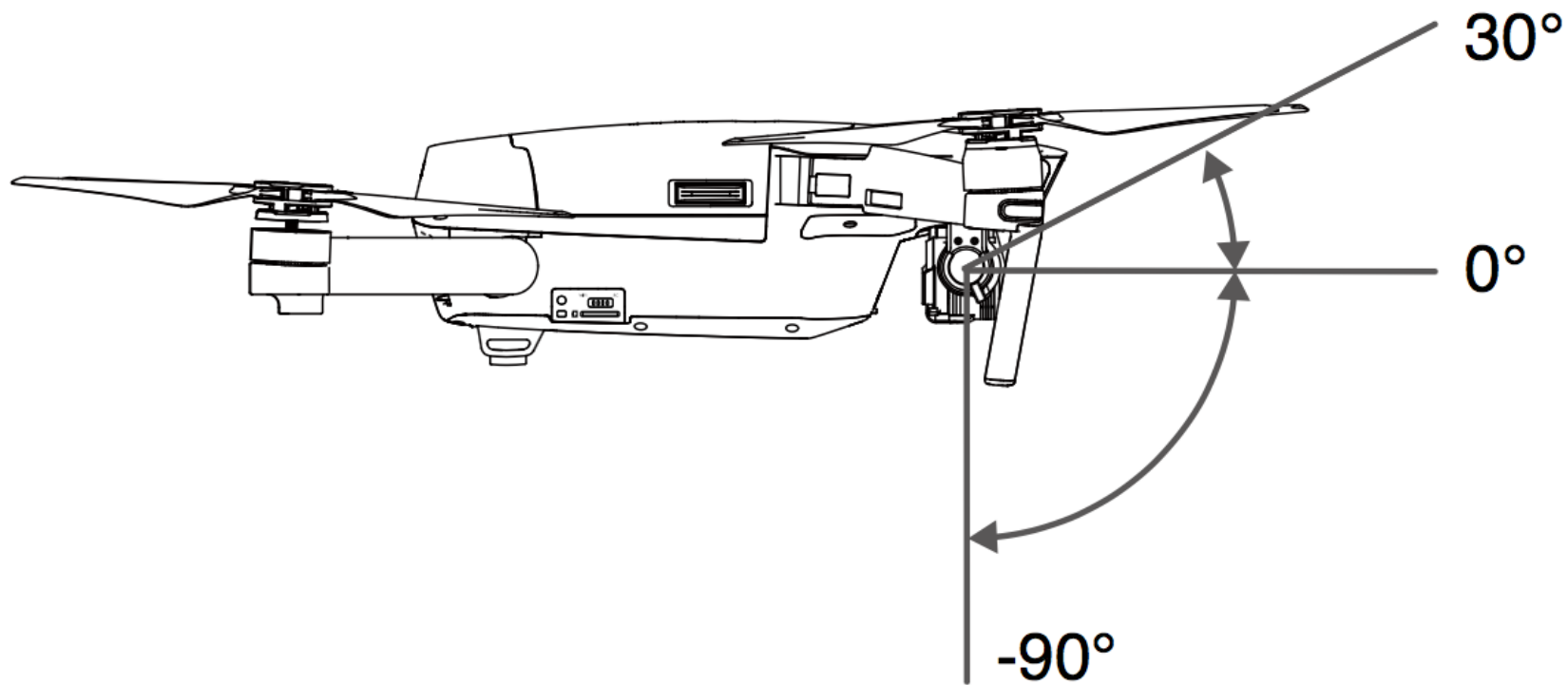
Left stick down (slowly) until you touch the ground
Hold a few seconds to stop the motors



- The motors can only be stopped mid-flight when the flight controller detects critical error.







Launching and Retrieving

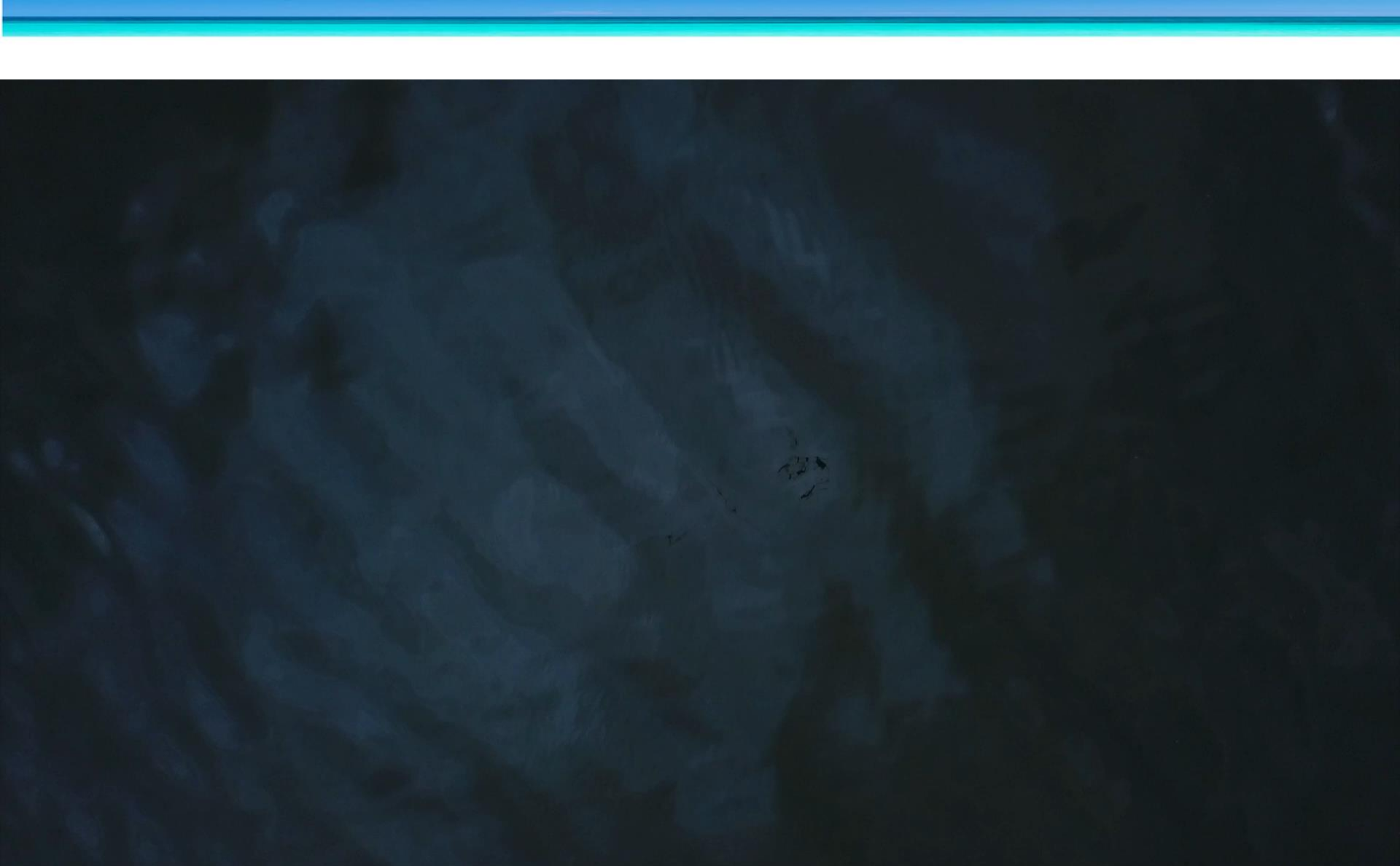












Your Opinion Matters

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Thank you for attending this session