

DRONES for Sailboat Race Management

Presented by:

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Overview

- Definitions/Limitations/Regulations
- Benefits for Sailboat Race Management
- Lessons learned from 2017 season
- Requirements

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

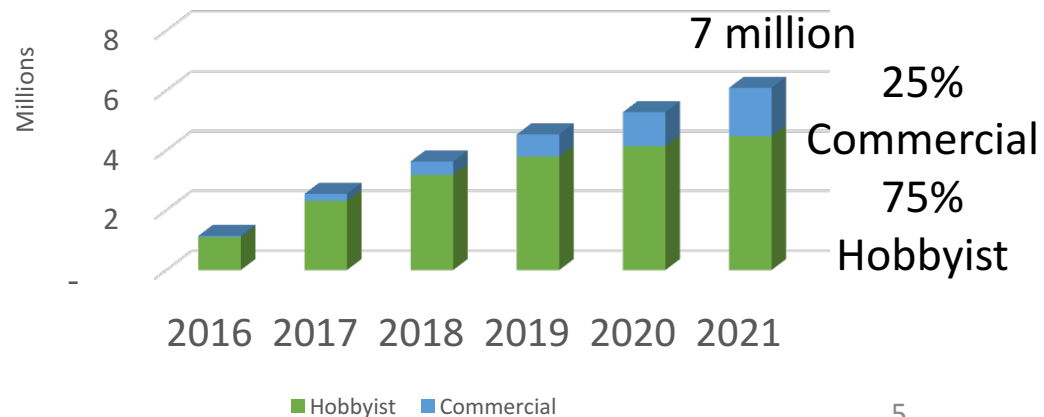
FAA rules regarding hobbyists versus commercial drone operators went into effect

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

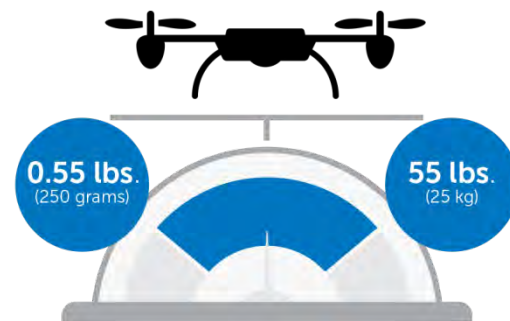
- If a drone is being flown as hobbyist, no licensing is required.
- If a drone is being flown commercially, under the FAA UAS Part 107 rule, the pilot must obtain a "Remote Pilot Airman Certificate" As of the end of 2017, there were 70,000 licensed, commercial drone pilots.
 - **FAA Remote Pilot Knowledge 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

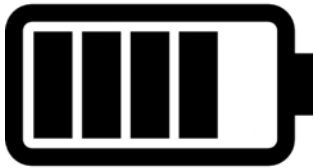
- If your club buys a drone, most commercial General Liability policies **exclude** coverage for aviation (and drone) usage if the drone is **owned by the organization**.
- You organization will need to purchase Commercial Drone Liability Coverage for:
 1. Third Party Bodily Injury
 2. Property Damage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

Operating Limitations

Amazing technology, but has limitations



Battery life – max 25 min, but
with Wind or Cold Temps,
Much Less



Wind – Max 22mph/20knts
Flying Against the Wind
Drains Battery



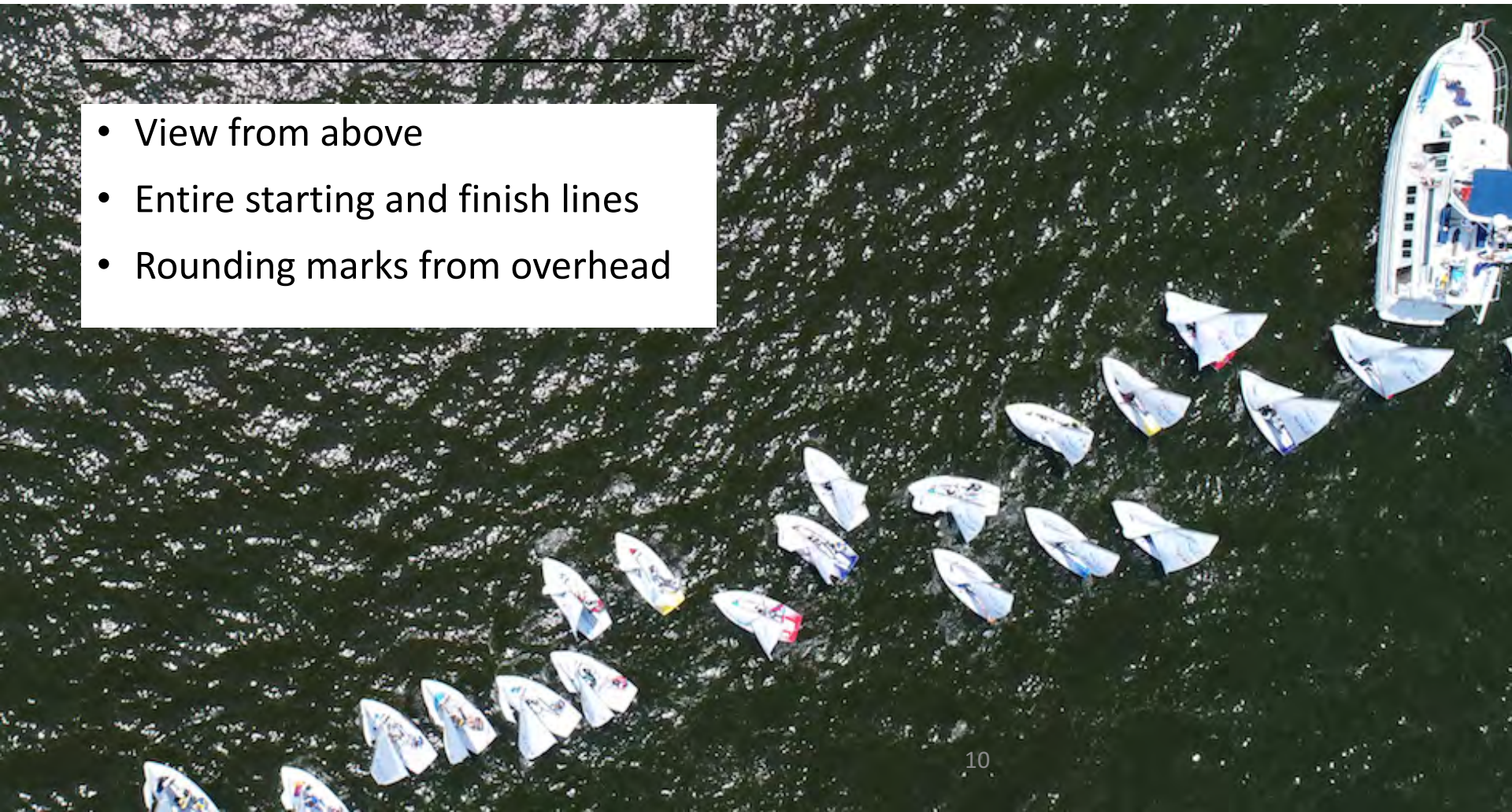
Temperature
Max 107°F
Lowest 32°F
Low Temps Drain Battery



Drones Are Not
Designed to Fly
in the Rain

Drones Provide RC New Perspectives

- View from above
- Entire starting and finish lines
- Rounding marks from overhead



One-Design Races Are Best

- Drone can position to capture starts, roundings and finishes
 - Drone need to be brought in to change battery between starts
- One-design races with multiple races are best for drones because the battery can be changed after the start and then head out to the roundings.
- Continuous starts (Wed Night Races) Don't work well due to battery life



Live Stream to Race Committee

- Drone can live stream the race using Apple TV
- Race Committee can watch starts, roundings, and finishes in real-time
- Post-race analysis requires processing of the video
 - Video is on an SD Card in Drone
 - Files are very large 2gig+ for 15 minutes



Launching Can be Challenging

- Signal/Committee boats
 - Sailboats and some trawlers are very difficult to launch from
 - Rigging hard to navigate drone
 - Open signal boats are the best
- But, you can hand launch and retrieve



Drone Ops & RC Considerations

- Competitors should be informed drone will be operating
- Drone ops need to be discussed with RC to insure a smooth integration
 - Drone pilot needs to announce when drone is being launched to prevent startling race committee
- Be sure to check the weather, air space, and the max height of the masts
- Ideally need a drone pilot AND an assistant to watch drone, direct pilot, and hand launch/retrieve drone



Closing thoughts

- Two drone pilots are optimal to capture starts, roundings, and finishes
 - Keep drones in air by alternating to bring in to change batteries
 - 2nd drone pilot can provide visual observations and launch/capture
 - 2nd drone pilot does not need to be a licensed drone pilot. Can fly under the authority of the Pilot in Command
- Policies and procedures need to be developed
 - Will images be included in protests?
 - Who is in charge of drone?
- Have adequate **insurance coverage** in place and understand club owned drone versus a non-owned drone



Skylark Drone Research has been working with the Annapolis Yacht Club to develop policies and procedures for using drones for sailboat race management, coaching, yacht club events, and other applications.

Contact Skylark Drone Research to work with your sailing organization to develop a drone program designed for use of drones in sailing programs.

Contact Info



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