

# The BVLOS Experts

JAKE ZELMAN

EMERGENT AIRCRAFT SYSTEMS AND THE DISPATCHER WORKSHOP

MARCH 14, 2018

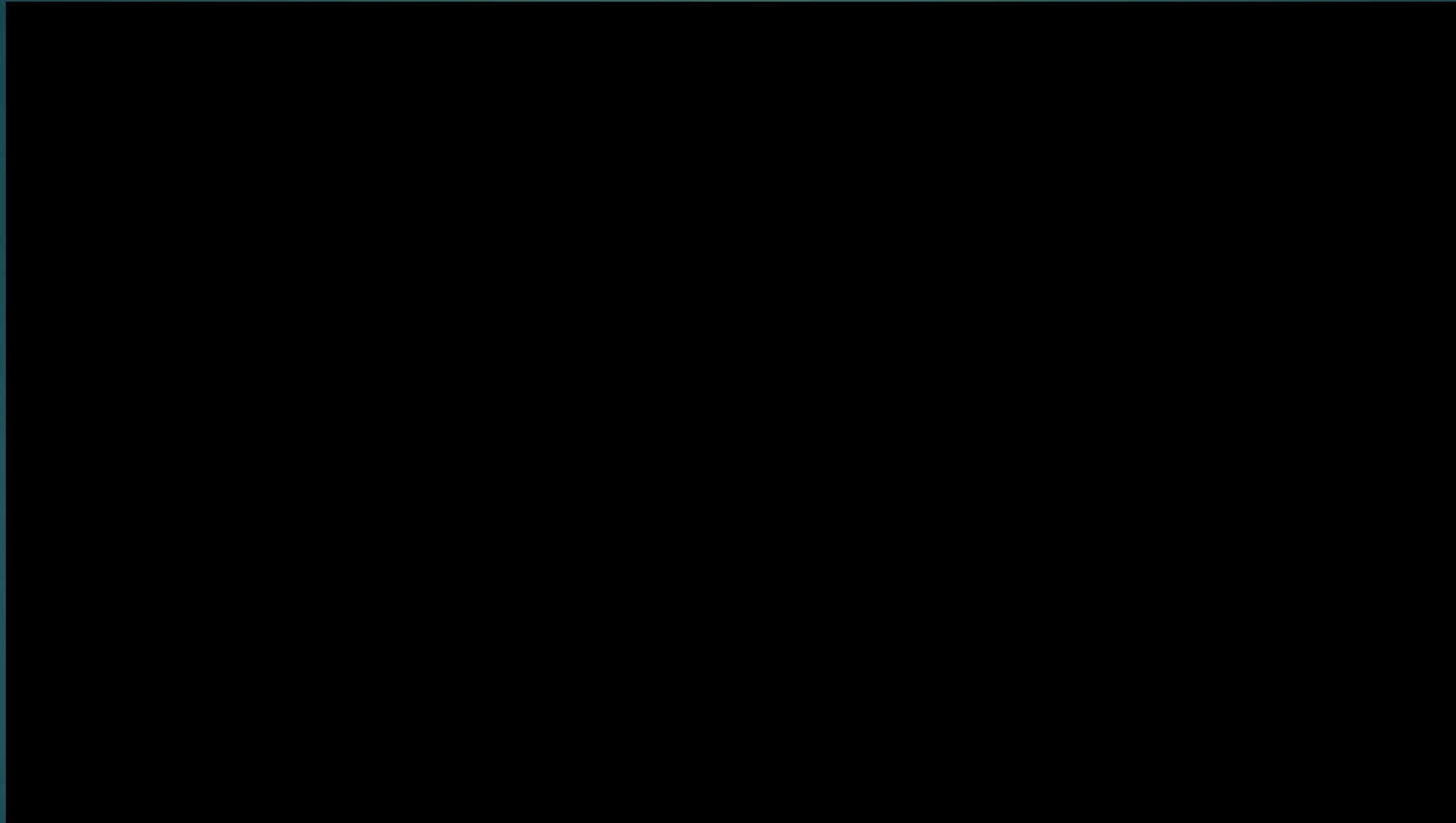
# Jake Zelman

- ▶ Vice President, Information/Technology, Airline Dispatchers Federation
- ▶ Dispatcher, Southwest Airlines
- ▶ Certifying Officer, Federal Aviation Administration

warning!



so different, yet so similar



# BVLOS waiver granted

## **GreenSight Agronomics Granted FAA Waiver For Beyond Visual Line Of Sight (BVLOS) Drone Operations**

Posted on *January 19, 2018* by *greensight*

*GreenSight is 9th Company to receive waiver for BVLOS in the United States*

BOSTON, MA, January 19th, 2017 – GreenSight Agronomics, a drone services and agricultural intelligence provider, has secured a waiver from the Federal Aviation Administration to operate its drone system beyond visual line of sight (BVLOS). BVLOS operations allows GreenSight to control its drone systems stationed anywhere in the world remotely from its Boston command center. While this waiver still requires a local visual observer, it is an important first step toward unattended operations.

# the vision

- ▶ aircraft dispatchers are integral to the aviation industry, monitoring thousands of aircraft movements on a daily basis
- ▶ the UAS generational paradigm shift shares countless similarities to today's FAR Part 121 operation, therefore it should adopt the utilization of aircraft dispatchers

countless similarities what?!



**SHARK TANK**



automated



automated



# why?

- ▶ what factors/considerations could possibly justify the use of a human monitoring the progress of a UAS, such as an aircraft dispatcher?
- ▶ there are considerations where a human is absolutely necessary





# pillars of dispatch



# pillars of dispatch

- ▶ regulations
- ▶ asset monitoring
- ▶ weather
- ▶ navigation
- ▶ supply chain management

# regulations

- ▶ the aircraft dispatcher is certificated
- ▶ operations specifications (ops-specs)
- ▶ current rules
- ▶ future rules
- ▶ operational control

# operational control

## 14 Code of Federal Regulations- Federal Air Regulation 121.533 Part B- Responsibility for Operational Control:

### Sec. 121.533 — Responsibility for operational control: Domestic operations.

(a) Each certificate holder conducting domestic operations is responsible for operational control.

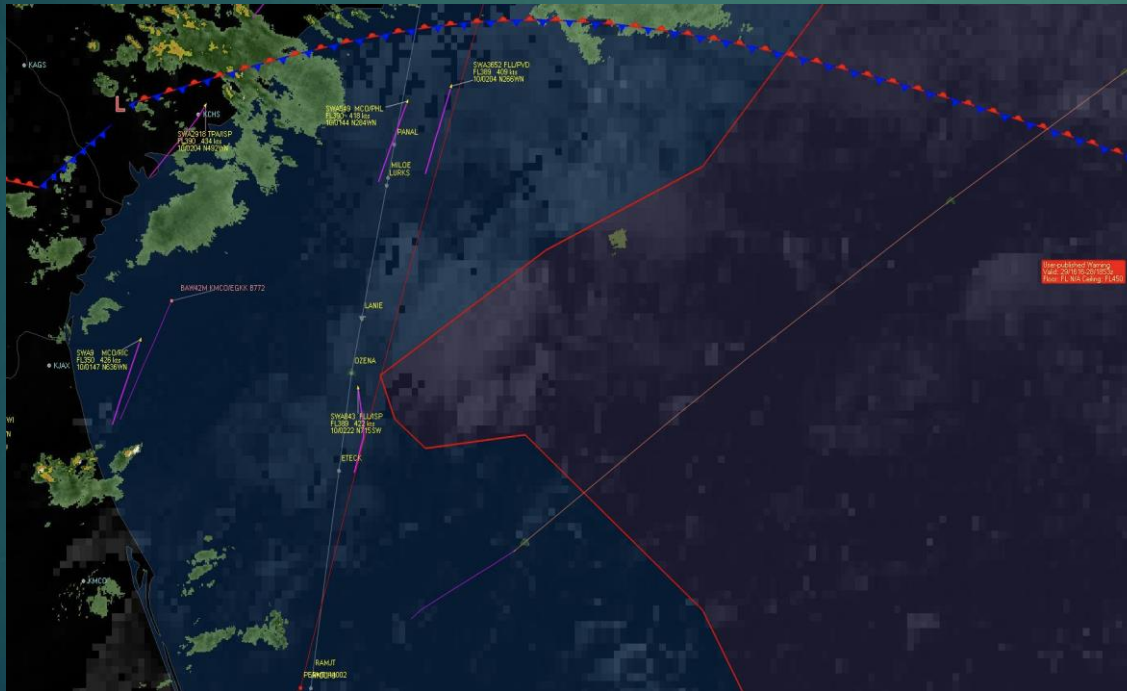
(b) The pilot in command and the aircraft dispatcher are jointly responsible for the preflight planning, delay, and dispatch release of a flight in compliance with this chapter and operations specifications.

(c) The aircraft dispatcher is responsible for—

- ▶ (1) Monitoring the progress of each flight;
- ▶ (2) Issuing necessary information for the safety of the flight
- ▶ (3) Cancelling or redispatching a flight if, in his opinion or the opinion of the pilot in command, the flight cannot operate or continue to operate safely as planned or released.

# asset monitoring

- ▶ flight following
- ▶ macro or micro
- ▶ fleet management/asset tracking
- ▶ NOTAMs



Monitor: Tue, Jun. 16: ACARS Unread Messages

Message	Flight	Dep-Air	TailNum	Time	Subject
<span style="background-color: green; color: white; padding: 2px;">Send</span>	1234	SEA-SFO	N7736A	2153Z	HOLDING REPORT FOR N7736A: [REDACTED]

FL	TR	DEP	ARR	TAIL	CLASS	STATUS	OPER	DEST	ORIG	TIME	TYPE	OPER	STATUS	OPER	STATUS
01	001	SEA	SFO	N7736A	R	C1	MDW	BVT	STL	0080	00	25	00	00	00
02	002	SEA	SFO	N7736A	R	C1	MDW	EVR	DEN	0079	00	25	00	00	00
03	003	SEA	SFO	N7736A	R	C1	MDW	PHL	MCO	0078	00	25	00	00	00
04	004	SEA	SFO	N7736A	R	C1	BNA	BOS	BVT	0077	00	25	00	00	00

# weather- Uber Whitepaper

## Weather

Due to the increased consequences of a failure enroute, environmental conditions and weather have more acute implications for aircraft than automobiles. Thunderstorms that create large wind shear, icing, and low visibility during the takeoff, departure and landing approaches are the largest sources of aircraft operations interference. Heavy precipitation and wind gustiness create volatile conditions that cause further disturbances during takeoff and landing can make it difficult to maintain vehicle control and reasonable safety margins. Ensuring the highest safety without embracing operational complexity (i.e. spraying vehicles to remove ice prior to takeoff such as airliners) will be particularly important in the early years of any large VTOL network, which has implications for the specific urban locations where we'll focus in the near-term.

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**UBER**

# weather


- ▶ greatest impact to UAS operations
- ▶ passenger carrying or cargo carrying
- ▶ what is good? more importantly, what is bad?
  - ▶ precipitation
  - ▶ cloud layers
  - ▶ visibility
  - ▶ wind speed/wind sheer
  - ▶ icing

# routing- Uber Whitepaper

## Routing



Beyond locating and constructing vertiports and vertistops, VTOLs will need a route structure from any one location to any other to make integration with air traffic control practical. While there is no provision yet for dedicated VTOL routes in the U.S. National Airspace System (NAS), an equivalent construct is simple to define by negotiation with ATC, just as news reporting and medical aircraft have defined routes. For the foreseeable future, aircraft operating in urban areas will still use voice communications with ATC to allow for the variety of traffic, but in the next few years all aircraft will have readily available cockpit displays showing all the other nearby aircraft. Through experience with piloted operations along the same routes, it will be possible to demonstrate the basis of an autonomous route structure, which will evolve to avoid conflict with existing aircraft operations.

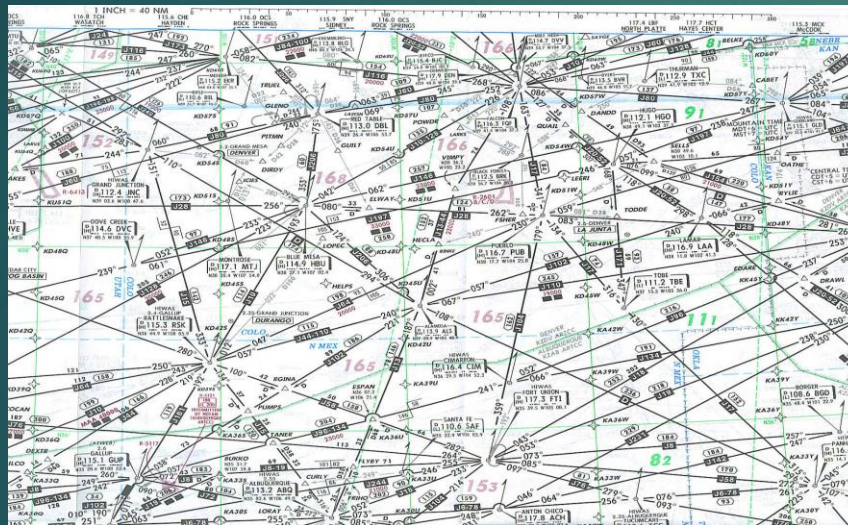


In some areas, such as the San Francisco Bay area, there are natural features such as the bay itself that lend themselves to VTOL routing. The tools for developing routing are the same as employed today for other low altitude traffic. This is another area where careful routing optimization will be key. For instance it will be possible to avoid the difficulties experienced when FAA implemented NextGen approach routing into SFO (residents complained of noisy aircraft appearing one after the other in precisely the same location) by randomizing route structure to a certain extent while remaining within corridors defined in coordination with ATC. Low altitude, maneuverable and quiet aircraft present unique opportunities that have not been present in previous air traffic planning scenarios.



# navigation

- ▶ aircraft dispatchers are experts in aviation charts and publications
- ▶ as UTM evolves, so will the architecture of UAS airways



# supply chain management

- ▶ coordinators/monitors of the health of the UAS
- ▶ parts and energy



# additional considerations

- ▶ dispatchers can mitigate stigmas and fears related to unmanned vehicles; certificated men and women on the ground are an extra set of eyes- public buy-in
- ▶ the value of the dispatcher's certificate
- ▶ FAA's recent Part 5 mandate; UAS no different
- ▶ hub of crowdsourcing information/ability to use vernacular

# let's go flying





# the aircraft dispatcher

- ▶ why the aircraft dispatcher?

- ▶ why NOT the aircraft dispatcher?

- ▶ Thank You!

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