



# Closing in on 500 Authorizations, Commercial UAS Operations Are Starting to Take Off

**W**ell the FAA held true to their words and have streamlined the [Section 333 Exemptions/Rulemaking](#) process leading to more authorizations to fly UAS for commercial purposes. I for one am very excited about this change and look forward to watching the UAS services market take-off (*pun-intended*). Thankfully, this is all public information so if you know where

to look and what you want to extract, you can find some really cool stuff. First off, the increase in approved exemptions has skyrocketed, going from a total of 9 in 2014, to more than 479 so far in 2015, at the time of this writing.

The chart in **Figure 1** shows an exponential escalation in authorizations as this year has progressed. Sure the pioneer's who waded through the

thicket of regulations in 2014, reaped the reward of being first to claim the title of "legal commercial UAS operators." However this came at a premium in both time and expense. On average it took them 180 days to receive authorization, and these were extremely limited in scope and location. The average turnaround time in May from date of request to notification of authorization was 85 days. Some were as short as 60 days, I would expect this trend to continue.

BY ERIC AND SHAYE ANDELIN

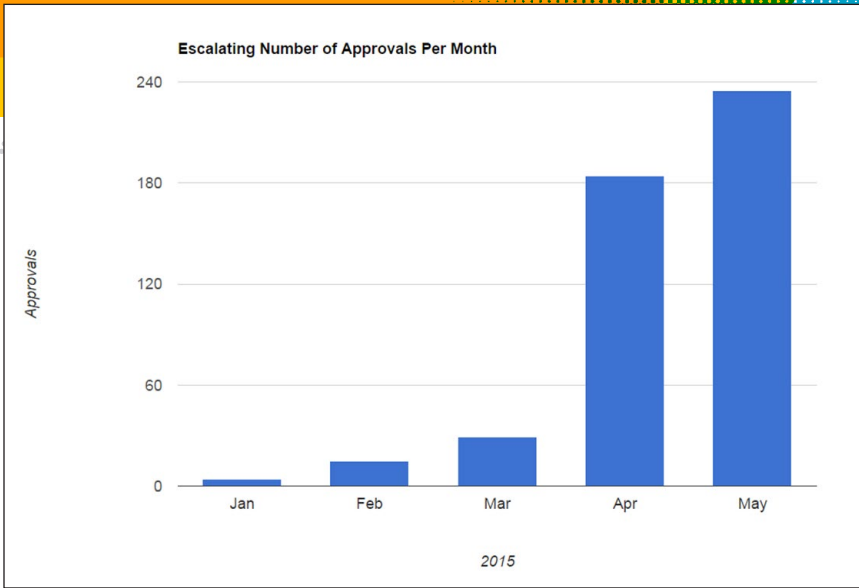


Figure 1: Escalating Number of Approvals in 2015

There are big changes in authorizations, both in what's being approved (the authorization process itself) and in what's being submitted. Each side has become educated over the course of this program. While each submission is reviewed and it is important that as the requester you are asking for the right exemptions, the FAA has streamlined the review process and generalized its response.

In asking for an exemption the FAA is looking for specific CFR's to be included. In addition they are looking for justification in granting your exemption as well as procedures indicating your ability to provide an equivalent level of safety. There are of course other considerations to include, but these can be found on the FAA's website if you are interested in applying. It just takes a little research, and thanks to all who have gone through the process before you there are plenty of examples.

If you don't really have the time, or better things to do with your time you can hire a professional services company experienced in the filing process. Of course an aviation lawyer or legal counsel is an option, but definitely not necessary unless you have a very unique and specialized request. Of all the exemptions granted so far in 2015

approximately 10% were submitted on behalf of the requester by legal counsel.

I have had the privilege of working on and/or submitting and receiving authorizations for multiple systems during this maturation process. My first effort was collecting all of the required documentation, going over the CFR's with which to request exemptions from, and figuring out the proper order to submit the exemption request and register our UAS. This was then handed over to in house counsel who turned it

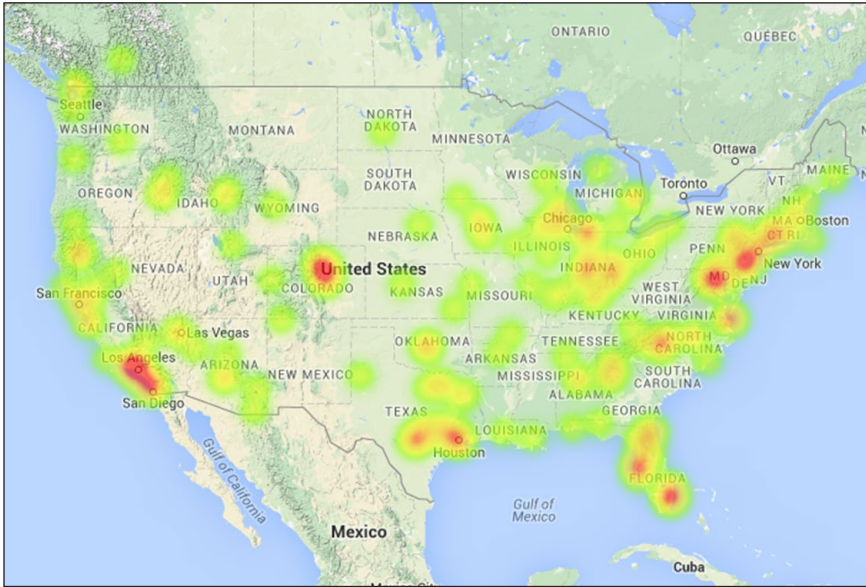
over to an aviation lawyer to process. 180 days later FAA authorization was received. The most recent one I submitted, I did myself and received authorization in 60 days.

What changed? Mostly the number times and repetition of items being reviewed in each exemption request by FAA staff. Just as I had become more educated in the process, so had the FAA reviewer's. While they read and review each and every one, unless there is something extremely unique the response has become boilerplate. I had a friend recently tell me he'd submitted his request and while he took exception to having any form of pilots license, he expected he would get authorization. I agreed, and he did...with the the boilerplate response that as a condition of exemption the Pilot In Charge (PIC) have a minimum of a sport pilot license. You can ask for the world, but you'll get a grounded in reality response.

So who is asking for all of these exemptions? Not surprisingly the

| 14 CFR PART   | SUMMARY OF REGULATION   |
|---|---|
| <b>Part 21 Airworthiness Certification</b>                                      |   |
| 21, Subpart H   | Certification procedures for products and parts, Airworthiness Certificates |
| <b>Part 61 Certification: Pilots, Light Instructors, and Ground Instructors</b> |   |
| <b>Part 91 General Operating and Flight Rules</b>                               |   |
| 91.103(b)(2)  | Preflight action  |
| 91.105  | Flight crewmembers at stations  |
| 91.109  | Flight instruction  |
| 91.119  | Minimum safe altitudes  |
| 91.121  | Altimeter settings  |
| 91.151  | Fuel requirements for flights in VFR conditions                             |
| 91.405  | Maintenance required  |
| 91.407  | Operation after maintenance   |
| 91.409  | Inspections   |
| 91.417  | Maintenance records   |

Required CFR's To Be Addressed In An Exemption/Rulemaking Request



Heat Map Showing May Authorizations

majority indicate aerial photography and/or real estate photography as a primary goal. These are entrepreneurial folks looking to turn a hobby into a business. Interestingly, the FAA clearly saw this and has since included a blanket certificate of authorization (COA) to fly under 200', with typical restrictions to all who receive an FAA authorization? Why did they do this? Because the number of requests for a COA to fly under 200' for just this purpose overwhelmed the system. Remember, prior to the blanket COA, every time someone wanted to fly at a new location, even with an authorization you had to apply for an individual COA. This could take weeks...for what a photo of a house? It was too much. The FAA finally agreed, and this inclusion of a blanket COA alone has greatly improved the viability of profitable commercial UAS operations. Runner's up: videographers and those wishing to use them for mapping of some sort or for agricultural purposes. Sometimes the

names of the companies are self explanatory but still amusing...I Drone Your Home was one recently approved.

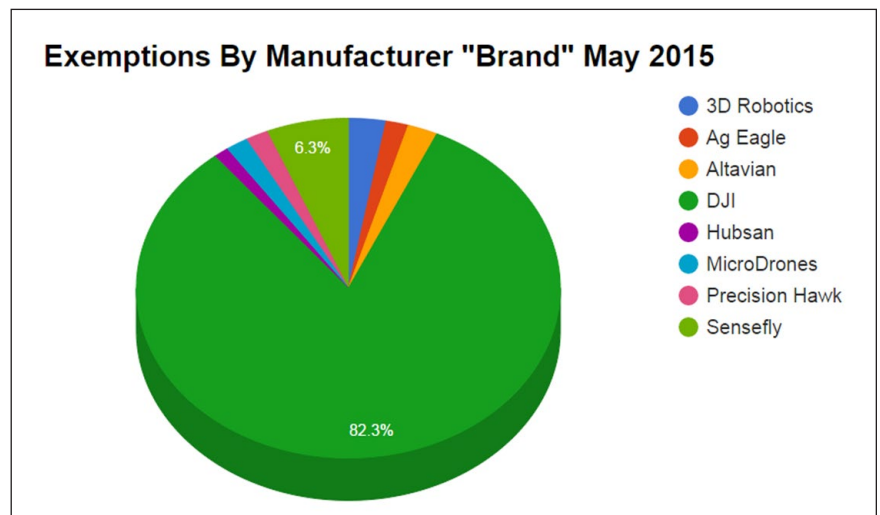
Authorizations have been granted for businesses in most states and just based on the low barrier to entry, number of potential competitors, and expense of mobilization they will likely operate

within a small footprint around the business address, Of course there are other factors that could expand this range, multiple offices capable of operation, client specific needs or requirements and so on.

This heat map shows FAA authorizations in the month of May, More densely populated locations have as expected more businesses offering these services with an FAA authorization—CA, CO, FL, TX, NY, PA are some of the leaders. Perhaps there is a correlation to the hotter real estate markets.

So which manufacturers and systems are receiving the highest number of authorizations? Not surprisingly Multi-Rotors are by far the most frequently approved. This is probably more because they are better suited for stable, low altitude aerial photography and video, not to mention the relatively low cost and ease of use. Looking at authorizations in the month of May the clear winner is **DJI** with over 80% of the authorizations in May, followed by **SenseFly** with 6%.

The SenseFly system was listed in the majority of exemption requests



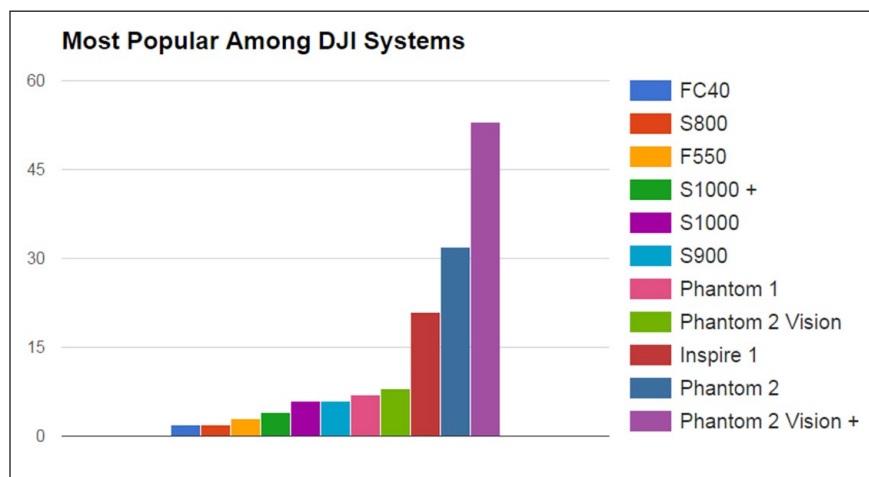
Pie Chart Showing Authorizations Listed In May by Manufacturer

that specifically listed agricultural surveys as the primary focus. Others in this arena were Altavian, AgEagle and Precision Hawk, all fixed wing systems. Still combined they only consumed around 10% of the authorizations in May. Does this indicate that the Ag market isn't as strong as the mainstream contends for UAS?

average aerial photographer. It's point and shoot, very easy to operate with the ability to tilt the camera from the hand controller while in flight and also view what is being captured real time. For around \$400 you can add a three axis gimbal making it equivalent to the Phantom 2 Vision +. Either of these is capable of nadir (downward looking)

based camera. I suspect it will rapidly climb the ladder of popularity in the coming months. at the same time **3D Robotics** will be making a play in the "easy to use out of the box" Multi-Rotor space with the Solo model.

Does having an FAA authorization mean you have the golden ticket? No, there is a lot more to it than that. Most authorizations originally were for one specific system. Meaning each time you wanted to add another, you would have submit an addendum to add it. More recent exemption requests include multiple systems to avoid this delay. Each UAS is also required to be registered, which is another process. Operations manuals are necessary, procedural manuals, maintenance and flight logbooks must be created and kept current. No matter what anyone tells you, a pilot's license is still required. Insurance is strongly recommended, and to get insurance they often include a requirement for some sort of training. Finally, State and local laws also play a role in one's ability to operate commercially. It's easy to just go out and fly a UAS, but when you want to operate commercially the time and investment required can be daunting. However, the process is getting easier and is moving faster. Happy, and safe flying out there! ■



Graph of DJI Systems Listed In May Authorizations Most Systems

It probably is, but when compared to other markets and uses at least for now it takes a back seat to Multi-Rotors and Multi-Rotor based applications. Full disclosure: any system or manufacturer with a count of only one authorization during this timeframe was removed from the following graph.

Digging a little deeper into the numbers on DJI's stronghold in the Multi-Rotor market, the number of authorizations by model indicates the Phantom 2 Vision + as the most popular, at least during this window of approvals. This is followed by the Phantom 2 Vision and the Inspire 1. The Phantom 2 Vision in its stock form meets most of the needs of the

photography and with apps provided by **Pix4D** and others are capable of mapping. The F and FC series of DJI's are kits and therefore less consumer market driven. The S models are often ordered pre-built and customized. These carry large payloads, ie: higher resolution cameras and are often considered more professional systems. As such the everyday aerial photographer is going to shy away from the added expense in equipment which provides little return for their needs. The Inspire 1 seems to bridge this gap and yet still remain affordable. Not shown, but mentioned earlier is the Phantom 3 which was just recently released. It offers 4K video, and enhanced controller and a new Sony

**Eric Andelin CP**, brings 35 years experience to the mapping profession. Eric's Geospatial background includes: Survey, Aerial Photography, Photogrammetry, GIS and Laser Scanning. Consistently seeking new technologies to further our profession.

**Shaye Andelin**, Eric's Daughter is a Student at Oklahoma State University and Account Coordinator with Vertical Information Services, Inc. (VERTX). Shaye contributed to this article performing the analysis on exemptions granted to date.