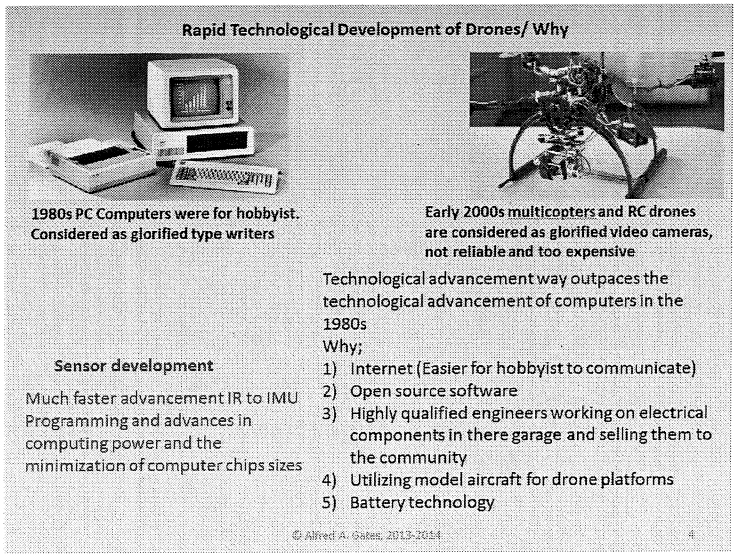
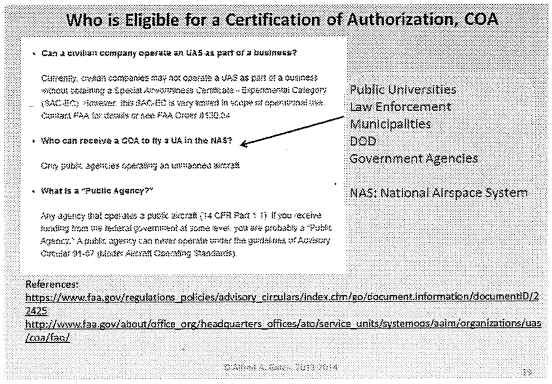
My presentation is broken into 5 sections

1) Explanation in rapid growth in technology catching the FAA off guard
2) Who can legally use unmanned aircraft, UA, and who is using them
3) Current and future capabilities of UA
4) Safety concerns
5) Recommendations to the state



1) Explanation in rapid growth in the technology catching the FAA of guard

The technology has rapidly advance on the software and hardware sides due to the internet, chat room, blogs You tube, etc. Hobbyists enjoy working on global community projects such as open source software, in this case its auto pilot open source software. Some of the open source autopilot software are better than autopilot software some of the military contractors can produce and is available for free. The users can modify the software for their application. Some hobbyist are manufacturing electronics literally in their parent's basements and garages and turning into successful companies in less than a year. The community is communicating, and transferring the technology over the internet. Compare this with the 1980s, with the development of the personnel computer where the hobbyist were not communicating with each other causing the technology development to be extremely slow compared to today. The UA technology is sophisticated now but in comparison to the future; were at the tip of the UA ice burger. These drones are like big clunky car phones of the late 80s. This technology will advance faster and the states will be caught off guard like the FAA.

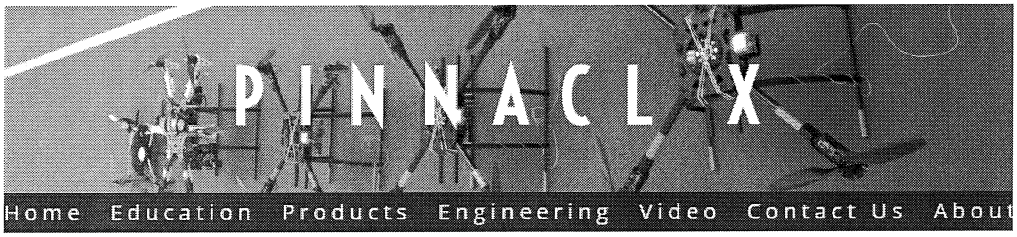


2) Who can legally fly UA and who is and what for

Any federal town or state agency can fly them such as DOT, state college and any municipality can fly them. All that is required is a Certification of Authorization from the FAA. This is an application process to make the usage of the

UA as safe as possible and to make sure that there is no interference with manned aircraft. To fly a UA there needs to be a pilot and observer and a designated area to fly the aircraft as listed in the COA application. The pilot at a minimum needs to have passed the written exam for a private pilot's license within the past two years and be proficient in flying UA. The pilot must also have a current class two medical certificate. The Observer must also have a current class two medical certificate. The UA must always be in the line of site of the pilot and observer and the pilot and observer must be in communication range.

Who is using UA? Colleges and universities, town fire departments and law enforcement. UA can be used for photography, structural inspection, crop management, real estate, environmental monitoring, wild life management, search and rescue, finding bad guys, accident investigation, to name a few applications. There are commercial UA operations already making money. Six UA operators have been approved to fly UA for TV and movies.



Taking Innovation to New Heights

Who We Are:

We are a Unmanned Aircraft Systems company that develops specialized multicopters for structural inspection and provides Unmanned Aircraft, UA, training involving FAA regulations principles of multicopter flight and flight training. Included in the training is instruction on the Certification of Authorization application process and flight procedures. Some of instructors have successfully obtained a COA from the FAA and are FAA certified helicopter flight instructors and remote control aircraft instructors. The mission of Pinnacl X is to provide a robust multicopter product capable of many structural inspection applications and to provide training in anticipation of the UA commercialization.

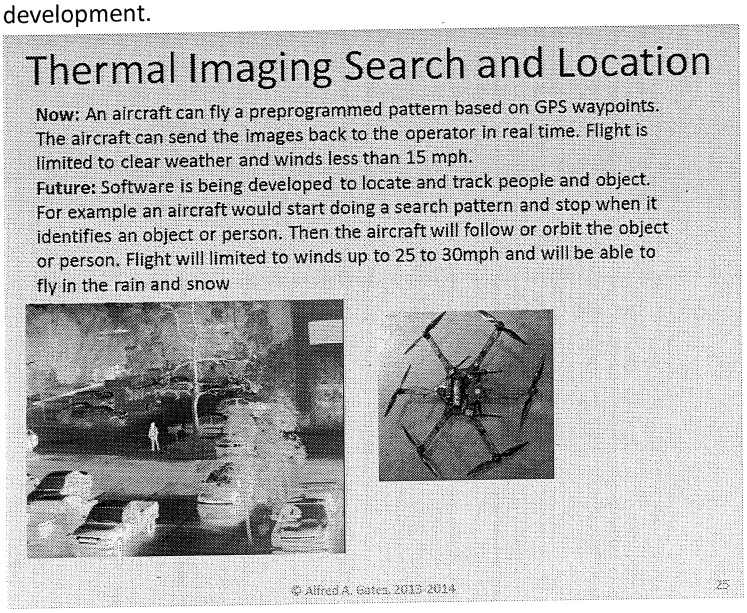
How We Started:

Pinnacl X has identified a need for robust aircraft capable flight in a unforgiving environment with high winds poor weather and in confined areas. The team has perform years of research and testing of the best autopilot systems and mid-rage aircraft available to determine performance qualities and areas of weakness. Recently Pinnacl X has teamed up with Northeast Utilities and Dr. Gates from Central Connecticut State University, CCSU to further improve our multicopter design for structural inspection which includes high tension power line inspection, bridge and structural inspection, fire and police applications using modified off the shelf still and video and thermal imaging cameras. Our multicopter design, CHAMELEON PRO, is based on the finding of years of UA product evaluation and the unmanned aircraft research performed by Dr. Gates. After examining the high tension power line flight data, Pinnacl X has designed out the shortcomings of the current multicopter technology. Pinnacl X also has developed training material for Law Enforcement and Fire and Rescue and will be involved with the first training program in October 2014 in Connecticut.

3) High Technology Employment Opportunities

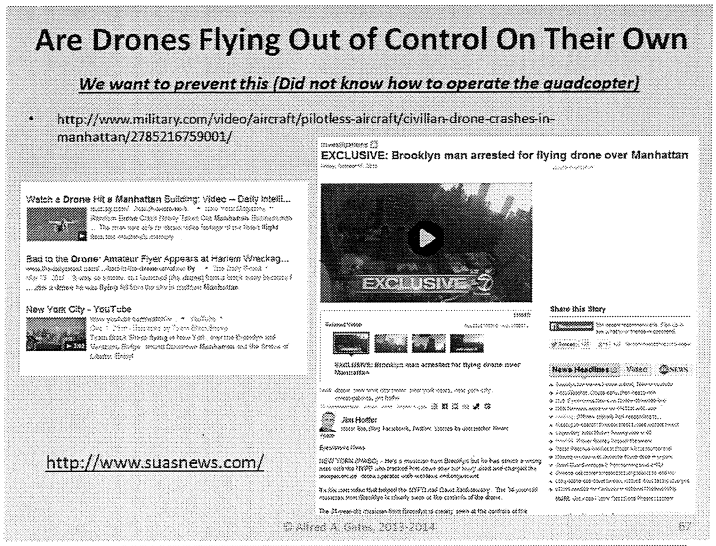
Large UA manufacturing and engineering will most likely stay with the big companies like, Bell, Bowing Sikorsky etc. Due to the high operating cost and the companies are adapting airworthy manned aircraft to UA. The small UA manufacturing and engineering will be dominated by small startups like Pinnacl X since the operating cost is minimal and RC aircraft are being outfitted with autopilot electronics. The strength of Pinnacl X is the years of experience of model aircraft, programming and UA research and development. For example Pinnacl X has developed software that will fly a multicopter UA faster than an experience pilot in a confined area. Additional industries will be developed in the UA service sector where UA are used to do tasks such as take picture, inspect structures, take samples etc.. This will be similar to commercial operations with helicopters and airplanes at a fraction of the cost and will be available at a moment's notice. I predict the requirements will be a UA licensed pilot and observer and the aircraft must have some type of airworthiness.

There may be some concern about job losses but what will happen is there will be a high tech job shift for many service positions involving inspection. The employed will be trained to operate UA similar to the auto industry starting in the 1980 transitioning to using automation and robotics for assembly. The workers were trained to operate the robots and it improved the quality of work by eliminating the boring mundane task. Connecticut is at a good position to be a leader in this industry due to the high technology manufacturing corridor and aerospace engineering background. However Connecticut is falling behind in supporting innovative UA technology development.



4) Current and Future Capabilities of UA

Currently UA can be flown manually like a RC aircraft manually or they can be flown semi-autonomously and fully autonomously from takeoff to landing. The aircraft does not require the interaction of a pilot. A program is up loaded to a UA and the UA executes the program like a robot. A unique capability of the best open source software is the ability to upload a new program in flight and you can have the aircraft make decisions based on the onboard sensor input. The video capabilities are the video feed is real time and the quality is a good as any camera you can get your hands on. An intelligent technologist need only program a pic chip to control the camera with a PWM signal. For example a pilot can fly a UA to a structure at over 200 feet, positioned the aircraft about 15 feet away take several pictures and download the picture to a computer. This can also be done with thermal imaging, where the camera looks at heat signatures making it possible to find people rather easily. Multicopters can out maneuver helicopters by flying extremely close to structures when operated by an experience pilot. The cost of a UA is equivalent to a handful of hours in a bell jet ranger helicopter. A multicopter flies very well in winds less than 15 mph for 10 to 20 min. A multicopter can be loaded up with batteries and flown for an hour but it will fly poorly. Fixed wing aircraft can fly easily for over 45 minutes autonomously. The accuracy can be as good as + or- 2 meters horizontal and + or – 1.5 meters vertical. To fly autonomously outdoors requires GPS receiver and a good GPS signal form several satellites and the satellites must be correct positions. Fixed wing aircraft fly in the open and rarely have any problems with losing the GPS signal since they are out in the open. Multicopters however are susceptible to GPS problems as well as other problems if flown by an unexperienced pilot. That leads into safety concerns. In the future the public will be able to purchase a UA similar to a DJI Phantom with an easy to operate autopilot systems and better position accuracy. Right now autopilot systems are difficult to operate. In the future multicopters will use additional sensors for improved accuracy. Airframes will be designed to handle higher winds and poor weather.


Are Drones Flying Out of Control On Their Own
We want to prevent this (Did not know how to operate the quadcopter)
http://www.military.com/video/aircraft/pilotless-aircraft/civilian-drone-crashes-in-manhattan/2785216759001/
Watch a Drone Hit a Manhattan Building: Video -- Daily Intelli...
Bad to the Drone: Amateur Flyer Appears at Harlem Wreckag...
New York City - YouTube
EXCLUSIVE: Brooklyn man arrested for flying drone over Manhattan
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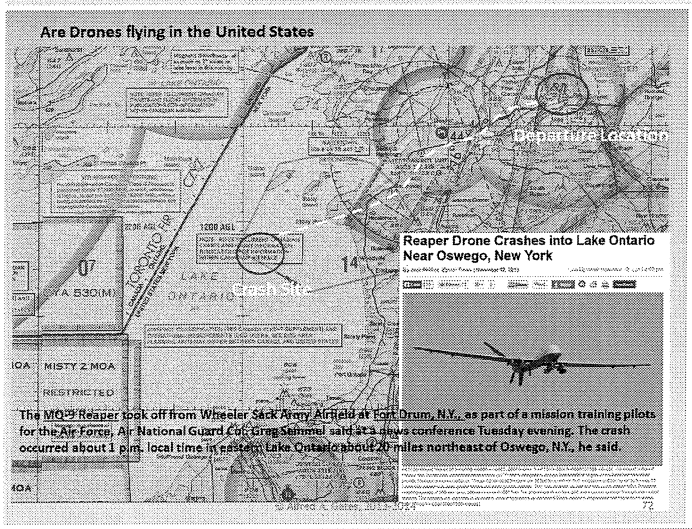
Are Drones flying in the United States
Departure Location
Crash Site
Reaper Drone Crashes into Lake Ontario Near Oswego, New York
The MQ-9 Reaper took off from Wheeler Sack Army Airfield at Fort Drum, N.Y., as part of a mission training pilots for the Air Force, Air National Guard Col. Greg Semmel said at a news conference Tuesday evening. The crash occurred about 1 p.m. local time in eastern Lake Ontario about 20 miles northeast of Oswego, N.Y., he said.
MISTY 2 MOA
RESTRICTED
LAKE ONTARIO
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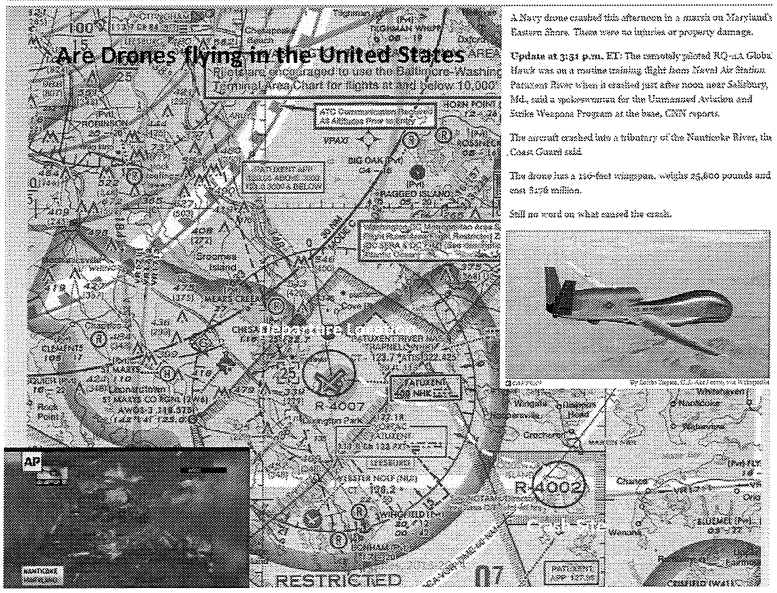
Are Drones flying in the United States
Departure Location
A Navy drone crashed this afternoon in a marsh on Maryland's Eastern Shore. There were no injuries or property damage.
Update at 3:31 p.m. ET: The remotely piloted RQ-4A Global Hawk was on a routine training flight from Naval Air Station Patuxent River when it crashed just after noon near Salisbury, Md., said a spokeswoman for the Unmanned Aviation and Strike Weapons Program at the base, CNN reports.
The aircraft crashed into a tributary of the Nanticoke River, the Coast Guard said.
The drone has a 116-foot wingspan, weighs 25,600 pounds and cost $176 million.
Still no word on what caused the crash.
By Senior Chief, U.S. Air Force, via Wikipedia
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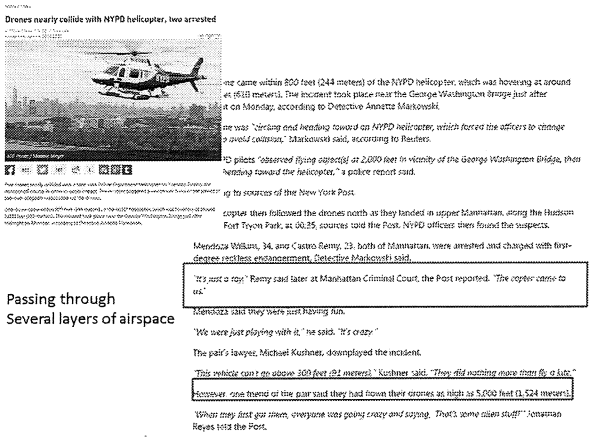

Drones nearly collide with NYPD helicopter, two arrested

[illegible] came within 800 feet (244 meters) of the NYPD helicopter, which was hovering at around [illegible] feet (610 meters). The incident took place near the George Washington Bridge just after [illegible] on Monday, according to Detective Annette Markowski.

[illegible] was "circling and heading toward an NYPD helicopter, which forced the officers to change [illegible] to avoid collision," Markowski said, according to Reuters.

[illegible]PD pilots "observed flying objects at 2,000 feet in vicinity of the George Washington Bridge, then heading toward the helicopter," a police report said.

[illegible] to sources of the New York Post.

[illegible] copter then followed the drones north as they landed in upper Manhattan, along the Hudson Fort Tryon Park, at 00:25, sources told the Post. NYPD officers then found the suspects.

Mendoza Williams, 34, and Castro Remy, 23, both of Manhattan, were arrested and charged with first-degree reckless endangerment, Detective Markowski said.

"It's just a toy," Remy said later at Manhattan Criminal Court, the Post reported. "The copter came to us."

Mendoza said they were just having fun.

"We were just playing with it," he said. "It's crazy."

The pair's lawyer, Michael Kushner, downplayed the incident.

"This vehicle can't go above 300 feet (91 meters)," Kushner said. "They did nothing more than fly a kite."

However, one friend of the pair said they had flown their drones as high as 5,000 feet (1,524 meters).

"When they first got them, everyone was going crazy and saying, 'That's some alien stuff'" Jonsman Reyes told the Post.

Passing through
Several layers of airspace

5) Safety Concerns

Multicopters or quad copters like the popular DJI phantom are susceptible to GPS drop out, Glitches signal loss etc. This happens when they get to close to something that blocks the signal like trees building, cars the ground people etc. An example of this is the incident a few years ago in NYC with a DJI phantom. Looking at the video it looks like the aircraft lost its GPS signal. When that happens the aircraft chases a point in space that is not there but the GPS receiver thinks it is there. This is not a problem for an experience pilot but an inexperience pilot will not know what to do. Safety problems are people buying UA and flying them in GPS position hold mode. That's when if you let go of the controls the aircraft stays where it is making flight very easy enough that a monkey could fly a UA. The problem arises when the signal strength decreases. Additional problems are that these new UA operators have no understanding of airspace. As demonstrated in NYC last month when someone flew a UA in the path of a police helicopter in controlled airspace. A helicopter is a giant vacuum cleaner and will suck anything into the main rotor or tail rotor if the object is close enough. For example no UA or manned aircraft can be flown over NYC NY, Greenwich CT on Tuesday, unless approved by the FAA, October 7, 2014 due to a, Temporary Flight Restriction, TFR. Understanding this information is a must for UA operators. Have large UA crashed in United States? "Yes". Multimillion dollar UAs have been crashed in United States for example the 176 million dollar Global Hawk crashed in Maryland, A MQ-9 Reaper crashed in lake Ontario New York to name a few. Are civilians crashing UA yes just do a search on the internet.

6) Recommendations to the State

The question was posed to me from Mr. Gray, would I recommend wait and see what happens or be proactive and try and make the a safe transition into this new era with some sort or regulations. I choose the latter.

Training must be required if a UA is flow around property and people to ensure that the proper procedures are conducted and to minimize the possibility of injury. To fly a remote control aircraft at an Academy Model Aeronautics, AMA club field required the pilot to demonstrate to an approved instructor basic maneuvers and emergency procedures. Flying a remote control aircraft is very difficult and it takes quite a while to learn how to fly one. Laws involving privacy should also be investigated however Law enforcement should have the opportunity to use UA due to all of the benefits they offer such as finding missing or lost people in the woods and crash sites and chasing suspects. And in the unfortunate event of a criminal act occurring, a UA can aide in providing a rapid assessment of what's going on. An example of the need for UA is to locate the suspect in Pennsylvania. In the case with criminal investigation warrants for their use should be investigated along with how the use would impact bystanders. Also the bad guys are already using them. Some illegal applications are dropping drugs cell phones, weapons and cigarettes into prison yards.