The past several years could be seen as some of the most dynamic when it comes to the remote-control (RC) aircraft community. There have been several key changes since even I joined the community “way” back in 3rd grade in 2004. Many of these changes have been overall beneficial to the hobby, but some have also shown some detrimental effects that need to be taken into account to ensure safety for all involved or not.

The first major change I can remember in my RC “career” was the switch to lithium polymer (LiPo) batteries. My first three planes initially had nickel metal hydride (NiMH) chemistry batteries. These batteries were fairly heavy and don’t necessarily deliver the same power density as LiPos. Though in comparison, they are generally much safer and easier to handle than a LiPo. They are able to be charged and discharged at a high rate without damage and maintain decent cold weather performance. Basic chargers that came with the aircraft were able to easily avoid overcharging the batteries. One could also realistically fly the plane until a power drop was felt and then land without having to worry about damaging the battery.

Now, with LiPos, the power density and performance may be much better than NiMH batteries, but there are so many more safety concerns to be aware of. Overcharging or discharging the packs can cause the internal battery chemistry to degrade, usually resulting in a puffy battery pack. In extreme cases this can lead to fires. Charging or discharging too fast can have the same result. LiPos are something one never wants to leave unattended while charging just because they are most susceptible to igniting when charging or discharging. I have even had a member at an RC club come in one day and tell everyone that half of his house, and his entire aircraft collection, had burned down after he left the batteries charging alone for two minutes. Proper research and care must be taken to avoid any serious issues with LiPos, including storing at the proper voltage if one is not planning on using them for an extended period.

Now, lithium-ion (Li-Ion) packs are gaining popularity, particularly in long-endurance platforms due to the much higher energy density compared to LiPos. These packs are very similar to LiPos, however each cell has a much lower safe discharge rate (or C rating). There are few premade packs available to consumers and many looking for this flight time increase or weight reduction are resorting to building their own packs, which comes with its own set of risks.

The next most prominent change in the hobby has been the shift from brushed motors to brushless. This I can only really see positives for, since the motors are so much lighter, efficient, and powerful. They have opened the doors for so many interesting projects and innovations. A design of note I saw earlier this year was created by a team at the University of Pennsylvania that found a way to manipulate the signal going to a brushless motor to be able to control a helicopter-like vehicle without conventional servos or a quadcopter-like platform.

The switch to 2.4GHz control systems has been another major change and is now the standard. Before, each RC pilot had to be mindful of which channel they were operating on so as not to interfere with other’s aircraft. Now, over 100 users can all use the 2.4GHz spectrum without fear of interference from another controller, making flying multiple aircraft in one location much safer and giving pilots one less thing to worry about.

By far, one of the most significant changes in recent years has been the availability of flight controllers to the everyday RC pilot. For some time, a small group of enthusiasts had been putting basic autopilot systems on their model aircraft with first person view (FPV) camera systems to fly long range sight-seeing missions. This evolved into more complex systems with GPS and added stability controls. When brushless motor, LiPo, and flight controller technology reached a certain point where it was powerful enough and light enough to fit on a small platform, quadcopters starting to grow in popularity (2005-2010). Having four points of thrust being precisely controlled to control the aircraft’s attitude and direction of flight opened up a whole new world of opportunities.
Being able to take off and land vertically meant people didn’t need runways or large open fields to launch and recover from. Companies quickly capitalized on this and began producing both commercial and hobby-grade systems. The flight controller technology improved to the point where almost anyone could fly if they understood the basic controls. Similar technology has been added to some starter fixed-wing RC kits to automatically correct for turbulence and limit roll and pitch angles.

I would make the argument that this implementation of technology alone is the single largest contributor to the growth in the RC market in recent years. We’ve reached a point where anyone can go to the store, buy a commercial kit that has stabilization and is GPS equipped and be in the air within a few hours of purchase. This is hugely beneficial to the industry as more people are getting involved with the technology and finding ways to improve or further utilize it, but it also comes at a cost.

Earlier in this development, there started to become more cases of individuals flying these grab-and-go systems where they weren’t allowed to or shouldn’t have. People have been caught flying near major airports near aircraft carrying people. There have been a few collision incidents between manned and unmanned aircraft. What started as a small group of enthusiasts in some farm fields or public parks had suddenly become the masses, and with that comes those who are ignorant of the rules that had been in place for decades.

This has caused some upset with the Federal Aviation Administration (FAA) who have been creating new rules and clarifying others in order to try to contain and minimize damage. However, I am of the belief that rules aren’t necessarily the solution but rather education. Hobbyists are almost always ready to share the dos and don’ts of the hobby with others as well as provide a guiding hand to ensure all aircraft and individuals nearby remain safe. However, not everyone getting into the hobby knows someone who already is involved. This is where I would like to see more outreach being done on the part of the companies putting out these ready to fly systems. Some autonomous quadcopter manufacturers have put in geofences to restrict flying around airports which is a great start, but has its own flaws and doesn’t necessarily do the job of teaching why one shouldn’t fly there but more telling that one can’t fly there.

Rules of where to and where not to fly are just one thing in the RC hobby that isn’t readily taught. Proper battery handling continues to be a struggle for many people I’ve spoken to and some of the more senior members at one of my RC fields don’t have computers to research the information themselves. I’ve also seen incidents where people work on their planes with a battery plugged in and don’t remove the propellers. This could lead to a serious injury if the throttle is bumped or a flight controller decides to add thrust. Education is currently an aspect of RC aviation that I’d like to see improved as a whole. There is much more the companies producing the ready-to-fly kits can do to inform their customers about how to be safe both in the air and on the ground as well as more outreach being done by those already involved in the community. Being told what the rules and consequences are only goes so far for some, but if users also gain an understanding of why certain rules are in place and how they can still accomplish their goal while remaining legal, it may help them make better decisions when flying overall. Flying safely hurts no one, but flying recklessly may hurt us all.