

Since the advent of the Cleveland National Air Show in 1964, the only way to get this view of Burke Lakefront Airport has been to be part of performance, as a professional stunt pilot, a member of the Blue Angels or the Thunderbirds, or perhaps the Golden Knights parachute team. This year, rotordrones captured this perspective with their onboard cameras as they joined the show's lineup for the very first time. (Photo by Brent Lane)





FLYING WITH THE BIG BOYS

Autonomous multirotors take to the skies at the National Air Show in Cleveland

BY **PATRICK SHERMAN**

PHOTOS COURTESY OF **THE ROSWELL FLIGHT TEST CREW**

It all got started when I was invited to do a demonstration at a meeting of the Cleveland Low Flyers," Matt Mishak told me, recalling how this first-of-its-kind demonstration got off the ground. "They're a group of local manned helicopter pilots: LifeFlight, news choppers, law enforcement — people like that. "To be honest, they weren't really all that well-disposed towards drones, because of a few close calls and sightings they had in the past. This was out at Lakefront Airport, where the air show is held every year. The organizers were there, and so were some other folks, like members of the FBI assigned to aviation issues."

With more than a little apprehension, Mishak powered up his rotordrone and thumbed the left stick forward. The machine's whirling propellers lifted it skyward and he began a series of maneuvers, showing off its stability and flight characteristics.

"Everyone was just mesmerized by it," he recalled. "They thought it was just amazing, which is pretty much the same reaction I get whenever I do a demonstration for people who don't work in aviation.

"The organizers said, 'We need to have these guys come out and be part of the air show!'"

Famed inventor Thomas Edison once fixed the ratio between perspiration and inspiration necessary to realize an idea at 99 to 1. Based on Edison's estimate, Mishak's demonstration had brought him one percent of the way toward his goal of flying autonomous multirotors as an official part of the program at the Cleveland National Air Show.

North Coast drones

Mishak is an entrepreneur and avid drone proponent — not only for the benefits that their peaceful, non-intrusive applications can provide for society — but also for the potential they have to improve the northern Ohio economy. His company, Dronewerx (dronewerx.com), is a member of the Northern Ohio Unmanned Aircraft Systems Association (nouasa.org), which is trying to gain a foothold for the industry in Cleveland and other communities located around the state's "north coast" on Lake Erie. Of course, Ohio has a long and storied history as a hotbed for aviation innovation, starting with a bicycle repair shop opened in 1892 by a pair of brothers living in Dayton with a keen interest in kites. It is also home to Wright-Patterson Air Force Base and a cluster of private companies working in the aerospace sector.

"Drones are going to be the next big thing," said Mishak. "All of the states here in the Midwest want to get a piece of it, but that whole area around Dayton-Columbia-Cincinnati is already a big player in this field. I've always thought that if we could get the northern part of the state on board with it, too, that would make us almost unstoppable."

Pulling off a first-ever autonomous multirotor demonstration at a national air show would be a strong signal to the rest of Ohio, and the country, that Mishak and his allies are serious about carving out a piece of the coming drone revolution for themselves. However, as Mishak explained, there were

still a couple of obstacles that he needed to overcome.

"The air show coordinator was a little worried about me, because I was an outsider: I'm not a stunt pilot, or a member of the Blue Angels, or anything," he said. "I sat down and came up with a proposed routine and submitted it to the Air Boss. He must have liked what he saw, because he approved and put us into the mix — we were officially added to the lineup as an act."

The Certificate of Authorization is most familiar to drone operators as the document issued by the Federal Aviation Administration, allowing universities and public safety agencies to operate unmanned aircraft systems in spite of the agency's current blanket prohibition. However, as Mishak explained, COAs are also issued for events like air shows, and his demonstration was conducted under the auspices of the Cleveland National Air Show COA.

"Initially, I was kind of paranoid about the whole thing," he remembered. "I knew that I had all of the necessary approvals. I knew that everyone who was going to participate was an Academy of Model Aeronautics member. Still, it was just nerve-racking."

The big show

It was at this point when we became involved. Along with Mishak, the Roswell Flight Test Crew is also a member of the AMA's Small Unmanned Aircraft Systems Advisory Group, a diverse collection of drone advocates and enthusiasts coming together to help the organization develop programs for this fast-emerging facet of model aviation community. Mishak announced the event to the group and we immediately thought: "Multirotors!? A demonstration with 300,000 people in attendance!? We have to be there!" In spite of the fact that this seemed like an absolutely perfect opportunity to educate the public about all of the beneficial applications of rotordrones, we very nearly could not make the trip. Fortunately, GoProfessional Cases (goprocases.com) stepped up and became our official travel sponsor and so we were on our way.

While three teams of pilots and their aircraft spread out down the length of Burke Lakefront Airport's 6,000-foot runway, we made our way to the announcer's stand. There, we described the action and gave the spectators some

information about the history and the future of miniature drone aircraft. It was exciting for me, but for Mishak, who had spent months preparing for this event, it bordered on the fantastical. "When everything went off like we planned, it was almost surreal," he told me afterward. "It felt like a dream come true." He may have been well prepared for the show, but he was completely unprepared for what happened afterward. "I was back at work the Monday after the show, and I started getting voice mail messages. By the end of the day, I had a dozen calls — all from the FAA," he said. "Most of them were from the local office, but one was from the regional office in Chicago. "I figured I'd call the local guys first, and see what it was all about, and I found out that we were getting some serious attention. They told me that they have a system of designations on their phone system, with a letter and a series of numbers, so maybe G-291 is some guy at a local office. Anyway, A-001 is like the director's office, and here in Cleveland, they were getting calls from A-002!"

The FAA responds

Returning the call from the regional office, Mishak discovered the reason behind all of the interest: the national headquarters in Washington, D.C., was under the mistaken impression that some rogue local FAA office had approved the drone demonstration. "I explained to them that we had just been approved as a regular act at the air show, like the local aeromodelling club," he said. "That's when the guy told me that the FAA had received more than 100 calls from all over the country from people wanting to do drone demonstrations as part of their local air shows. Once I explained how we'd done it, the guy in Chicago was completely cool with it; he had no objections or hard feelings at all. Everything checked out, as far as he was concerned." In less than 24 hours, Mishak's novel effort had spawned coast-to-coast interest in putting rotordrones right beside the Blue Angels and the Thunderbirds in a venue where literally millions of people will get to see them in action, demonstrating their safe, beneficial and non-intrusive applications. Viva la rotordrone revolution! ✈️



Event organizer Matt Mishak pauses to speak to a local television news crew about the potential beneficial and non-intrusive applications for small, lightweight civilian drones.



In addition to their daily aerial demonstrations, the Dronerwx and other members of Northern Ohio Unmanned Aircraft Systems Association had a tent set up along the taxiway which was crowded all weekend long with attendees interested in learning about drone technology.



RQCX-1 Little Bird captures an aerial view of the action during the drone demonstration at the Cleveland National Air Show while one of her autonomous cousins maneuvers in the background. (Photo by Bruce Bishop)

At the start of their autonomous drone demonstration at the Cleveland National Air Show, members of the Northern Ohio Unmanned Aircraft Systems Association walk out to a flight line to launch their aircraft. (Photo by Brian Zvaigzne)



Mishak's company, Dronewerx, is developing the PG-Y6 Guardian airframe (which features enclosed propeller nacelles) to protect both the propellers and people and property in the environment from collisions. Look for a full review on the PG-Y6 Guardian in an upcoming issue of RotorDrone. (Photo by Patrick Sherman)



Appearing together on the tarmac: the largest aircraft on display at the Cleveland National Air Show, a United Airlines' Boeing 737, and the smallest, the Roswell Flight Test Crew's RQCX-1 Little Bird FPV quadcopter. (Photo by Patrick Sherman)



Pictured here with the Cleveland skyline and Blue Angels F/A-18 Hornet in the background, are the pioneers who put on the first-ever autonomous drone demonstration at an FAA-designated national airshow. From left to right, back row: Brent Lane of Brent Lane Photography, Anthony Serio of Cleveland Aerial Media, Brian Zvaigzne of the Roswell Flight Test Crew, Michael Hach of Cleveland Aerial Media, Patrick Sherman of the Roswell Flight Test Crew, Matt Mishak of Dronewerx, John Ellenberger of Cleveland Aerial Media, Jeff Taylor of Event 38, Joseph Douglas of Event 38, Brandon Flint of Event 38, and Kane Hogan of Dronewerx. Front row, left to right: Mike Hanna and Neil Mabrouk of Dronewerx. (Photo by Bruce Bishop)