



The drone makes its final approach before landing on the airstrip. Video from the drone was distributed to 20 emergency operations centers around the state. Maps produced by the drone will be distributed through Smartphone apps at no charge.



The drone, or Unmanned Aircraft System, as NJIT prefers to call it, takes off toward the ocean from a launcher using a pole and compressed air. The launcher allows the drone to use a smaller engine, which is not capable of providing enough power for takeoff.

## Drone test

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used to fly model aircraft or to play a video game.

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The drone has the capability to stay airborne for 12 to 16 hours using just 1.5 gallons of gasoline, Yoel said, adding that the aircraft can fly as high as 15,000 feet.

A camera on the tail of the drone provides "situational awareness for the pilot," Yoel said.

"In the belly of the aircraft is a digital camera that is pointing downward and is able to take

high-definition imagery, so we are actually streaming those images to the mobile operations center, producing maps and then streaming them out to the Web for first responders while the aircraft is still in the air," he said.

Yoel said that between the wings of the drone is an 18-inch by 6-inch cargo bay that can carry 25 pounds of sensors.

As the drone flew its circuitous path, licensed pilots and other observers on the ground were watching the sky for other aircraft.

"They're talking with our pilot and command, and communicating to him any possible aircraft conflicts that they see that might be emerging," Yoel said.

Two helicopters were spotted by ground observers during the flight but were too far away to be of concern.

He said notices were filed with the Federal Aviation Administration several days before the drone flights began at the base.

"We're in touch with air traffic control. We get a clearance for launch, we notify them when we've landed. They can contact us at any time. We're listening to the aviation bands for traffic in the area as well as talking to air traffic control," Yoel said.

The drone has a top speed of 65 knots and typically cruises at 55 knots, with a stall speed of 31 knots. The aircraft does not carry a typical transponder to identify itself on radar and

operates as a research experiment, Yoel said.

He said the drone has emergency landing locations programmed into its autopilot. The drone has a backup power source to allow it to continue to be controlled if the engine fails, Yoel said.

If the drone is approaching a populated area with an engine failure, it can be pointed to the ground for a nose landing, he said.

Yoel said maximum takeoff weight is 86 pounds, but on the Jan. 29 flight, the aircraft weighed in at about 62 pounds.

Michael Chumer, NJIT director of Unmanned Aircraft System Research, said the Jan. 28 mission was the first flight of a UAS in national airspace in New Jersey.

"There have been flights in military airspace but that's not national airspace, that's different," he said.

The flights are being made to determine if the drone can fly as expected.

"We are concerned with privacy issues, so we are conducting our operations over the ocean to keep away from people's homes and any kind of perception of snooping on folks," Chumer said. "We're looking at payloads, sensors that can be applied to emergency response, homeland security and public safety."

The drone can also function as a flying cellphone tower capable of relaying calls and data from first responders in communities in which telecommunications equipment has been knocked out, according to a news release from NJIT.

"We plan to do a lot of activity at the Cape May County Airport and we're very close to getting our approvals from the FAA to do that," Chumer said.

He said the drone is flying

in "complicated airspace," indicating a lot of flight activity overhead at the base. Before launching the first flight, ground observers spotted a helicopter about to fly over the base.

"We communicated with the helicopter to make sure they're out of the way, and we look again and a second helicopter comes over, but that's what we're learning," Chumer said. "We're learning just how to deploy this new type of technology in crowded airspace."

When unmanned aircraft begin flying from the county airport, they will follow Fishing Creek to the bay to avoid overflying houses, he said. If the drone overflies houses, it would be at an altitude of at least 3,000 feet accomplished by first circling the airport to obtain that height.

The drone returns to the runway less gracefully than its takeoff. The aircraft does not have landing gear and makes a belly landing on Kevlar and nylon skids.

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**"Vintners Valentines"** SATURDAY  
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**1ST COURSE • "JERSEY SALAD"**  
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Date	High		Low	
	A.M.	P.M.	A.M.	P.M.
4	8:08	8:32	1:38	2:20
5	8:43	9:08	2:16	2:55
6	9:17	9:44	2:53	3:28
7	9:51	10:20	3:30	4:00
8	10:25	10:57	4:08	4:32
9	11:00	11:37	4:48	5:06
10	11:40	12:27	5:34	5:46
11	12:23		6:27	6:34

**MOON PHASES**  
Last Quarter, Feb. 11 • New Moon, Feb. 18

**Cape May Star & Wave**

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\*\* 3D Seventh Son PG-13 11:40, 9:50  
\*\* 2D Seventh Son PG-13 2:30, 5:00, 7:30  
\*\* Project Almanac PG-13 11:50, 2:20, 4:50, [7:20, 9:55]  
\*\* Kingsman: The Secret Service R Thursday Premier 8:00  
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American Sniper R 12:10, 3:10, 6:50, 9:40  
Bay Next Door R 11:45, 2:10, 4:20, [7:40, 10:00]  
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