

UAV UPDATE 52

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The Draganflyer X6 is a six motor electric powered UAV helicopter capable of carrying a wide range of camera payloads.

Combined mission testing

Fixed wing - helicopter - robot

Mark Bateson

The purpose of this exercise was to show the combined use of three different robotic platforms to search an area from a safe distance. This scenario takes us from 100 meters over the search area to a few millimeters above the ground.

Testing was done using three electric powered vehicles. (1) The Procerus autonomous Unmanned

Aerial Vehicle, (2) Draganflyer X6 semi-autonomous UAV helicopter and (3) a ground based throwable robot from Recon Robotics.

The scenario is fictitious and assumes information of a suspect bomb was phoned into a high tech company. No manned air assets were immediately available. The agency Unmanned Aerial Vehicle (UAV) team was called out to initially clear the area of any

persons and assist ground units searching the area.

The target location is identified and the flight plan is downloaded to the Procerus autopilot system.

With the flight plan loaded the Procerus aircraft is hand launched and autonomously flies to the target with the programmed approach altitude set to 100 Meters AGL. In flight, the aircraft is transmitting live aerial video to





Pictured left, the Draganflyer X6 Helicopter provides high resolution imagery of dumpster contents.

Pictured below, the Procerus fixed wing aircraft descends through 70 meters AGL to a final orbit altitude of 50 meters AGL over the suspect area.

Mark Bateson



UAVs provide real-time video

Aerial video from 100 meters to less than 1 meter

the mobile command post located near the suspect search area. As the aircraft approaches it enters a pre-programmed orbit over the area.

The command post incident commander maintains constant communication with the UAV Pilot in Command (PIC) providing direction by identifying suspect objects or additional search areas to clear. In this scenario the incident commander identifies three suspect areas needing closer examination and requests the UAV PIC to tighten the orbit and drop altitude. The PIC drops the aircraft to 50 meters AGL and reduces the orbit to a 50 meter radius.

The resulting video provides the incident commander with greater detail and allows the commander to better clarify the targets but even more detail is required.

At this time the Procerus system is returned to the designated landing zone and replaced by the Draganflyer X6 helicopter. The helicopter is fitted with a High Definition triple CCD camera.

Based on target data provided by the Procerus system, the search has been narrowed to three suspect areas (1) the dumpster, (2) the domed hut and (3) the equipment trailer. The Draganflyer X6 is easily flown into the search area aided by a powerful on-board autopilot system. The Draganflyer autopilot system takes care of the tedious tasks of flying a helicopter so the PIC can focus on the mission, piloting the aircraft to key targets with precise control.

The PIC and observer have complete control over not only the aircraft but also the camera system allowing them to gain the required information demanded by the mission at hand. In

Ground based Scout robot

The robot provides a new perspective

high contrast situations even the finest and highest resolution cameras simply can not cut through the shadows. In this case the X6 helicopter is returned to the staging area where the camera payload is replaced with a FLIR Photon 640 Long Wave Infrared (LWIR) camera.

The X6 is flown back on-scene to look deep inside the dome shaped shed revealing a lawn mower. Along the way, the X6 uncovers a hot-spot deep in the target dumpster. The dumpster is easily checked from multiple angles with the camera but no obvious heat source is uncovered.

Before the bomb squad is called into search the area, the hand held throwable Scout robot is deployed into the area. To deploy the robot is thrown into the area from a safe distance and then maneuvered into position.

The robot provides live video to the operator and is easily controlled through a remote control handheld unit. Live video is displayed in both the mobile command post and the operators handheld unit as the robot is guided towards and under the dumpster. No obvious signs of a bomb are uncovered or heat source.

The robot is then driven up the trailer loading ramp and easily maneuvered to identify items strewn in the trailer bed.

At this point the combined efforts of the aircraft and ground based robot have cleared the area of

The Recon Robotics Scout robot is pictured below. The scout can be thrown into an area and then easily maneuvered to investigate the area as it broadcasts live video back to the operator.



people and identified key targets that can only be cleared and inspected by the bomb squad.

Although this is a fictitious scenario the test exercise demonstrates the ability to use multiple aircraft, payload sensors and robotics to safely assist in clearing and inspecting a suspect area.

For more information about the aircraft and technology contact Mark Bateson at (916)765-3030 or write to Mark.Bateson@gmail.com.

From left to right you see:

(1) dumpster hotspot detected by the X6 and FLIR Photon 640 located center near bottom.

(2) Scout robot is thrown into the area and being driven towards dumpster.

(3) an image from the Scout robot while searching under the dumpster.

