CLOSE UP

Street-Smart Maps

Geographic imagery synchs up with real-time video

DAVID HUGHES/OXNARD, CALIF.

AeroComputers Inc., a tiny company located in an aircraft hangar at the Oxnard Airport north of Los Angeles, has developed a synchronized video and moving map system for use in homeland security and military applications and police and fire department helicopters.

This *Aviation Week & Space Technology* editor saw the AeroComputers UltiChart LE 5000 system at work during a flight from the Oxnard Airport in a Cessna 185F tail dragger. It would be difficult to find a more economical testbed aircraft, though the UltiChart system has been developed to operate primarily in police helicopters.

Hanging off one side of the aircraft was a Cineflex DS 14 gyro-stabilized infrared and high-definition TV camera that displays video with 1,920 X 1,080 lines of resolution. The camera is valued at $1 million.

AeroComputers' founder and President Mark Gassaway was flying from the left seat and I was in the right seat. Soon we were above a major highway intersection where the forward-looking infrared (Flir) camera showed us all the vehicle and pedestrian traffic. A front-panel-mounted 10-in. monitor allows AeroComputers' ViewSync system to show the real-time Flir imagery on the left side and on the right side a moving map of the roads and buildings on the ground.

AEROCOMPUTERS INC.

The ViewSync displays images from an aircraft's Flir/video camera next to an area map with building and streets identified that moves with the camera imagery.

This combination of displays is designed to allow the tactical officer in a police helicopter to perform a variety of tasks quickly. These tasks previously had to be sorted out as the officer sat holding a flashlight in his teeth as he paged through a book of paper maps.

Now, when the helicopter lifts off, the officer can type in an address or location such as a state park. The LE 5000 can show the bearing and distance to the selected location. Once the helicopter is hovering over the scene, it will be possible to examine the surroundings to see, for example, if there is a suspect fleeing the area.

As we looked at the crisp image from the Cessna 185F, it was clear to me that we would be able to spot a suspect running away and determine the exact highway intersection without having to shuffle through any paper maps. Gassaway says that even from 10,000 ft. and 4 mi. away, it is possible for the camera to show a suspect making a cell phone call while the UltiChart map displays the address of the building he is standing in front of.

After we landed, Gassaway said he had launched another computer equipment company in the early 1980s, but sold it when the workforce reached 70 employees because he decided it had grown too large and he wasn't having fun with it anymore. Then Gassaway decided to combine his interests in working on aircraft and computers. The result was AeroComputers, which Gassaway considers just the right size at 14 employees.

Now when Gassaway and his software engineers want to test new programs, they just walk from the glassed-in "office" side of the hangar to the aircraft side, where his Cessna 185F tail dragger is parked. They push the aircraft out onto the ramp and go fly. It's all in a day's work, but Gassaway and his colleagues seem to be having too much fun to call this work.

Gassaway says that for the first year and a half after the company was formed in 1994, he and his technicians flew around in the back of police helicopters for hundreds of hours to learn how cops think and work. AeroComputers' first customer was the Los Angeles County Sheriff's Dept., which still uses the company's moving map system. One of the first things Gassaway and his technicians concluded is that the tactical officer in the helicopter (who is trying to direct units on the ground) is a very busy person. A moving map would have to be simple to use or no one would buy the system, they decided.

Minimizing the number of button pushes required to activate system responses is one way to simplify things, and another is to display key data in a series of boxes. The LE 5000 display can be configured by the user to show various data in these boxes, such as the aircraft's track, speed and altitude, the angle of the Flir camera and information on the area a helicopter is flying over. Customers can also add their own proprietary maps to the system.

Current users of the 330 LE 5000 systems in service include the Los Angeles Police and Fire Depts.; New York and Washington Police Depts.; California Highway Patrol; FBI, U.S. Drug Enforcement Agency; U.S. Homeland Security Dept., and U.S. Army Special Forces.

The LE 5000 costs $30,000-40,000 depending on how it is configured with a camera. The system also includes a feature called ViewTrace, which allows an operator to track a wildfire or incident with the video/Flir camera and display the trace on a moving map. A panel on the display calculates the fire's area and perimeter.

Gassaway says that during rescue operations in the wake of Hurricane Katrina, one helicopter equipped with an AeroComputers system found a survivor in a unique way. The survivor called the police and said she was located in an attic in her house, but most of the house was under water. By selecting the address on the moving map, the helicopter crew was able to pinpoint her location in the flooded neighborhood below and pull her to safety.

Page 77 11/21/06 1:50 PM
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