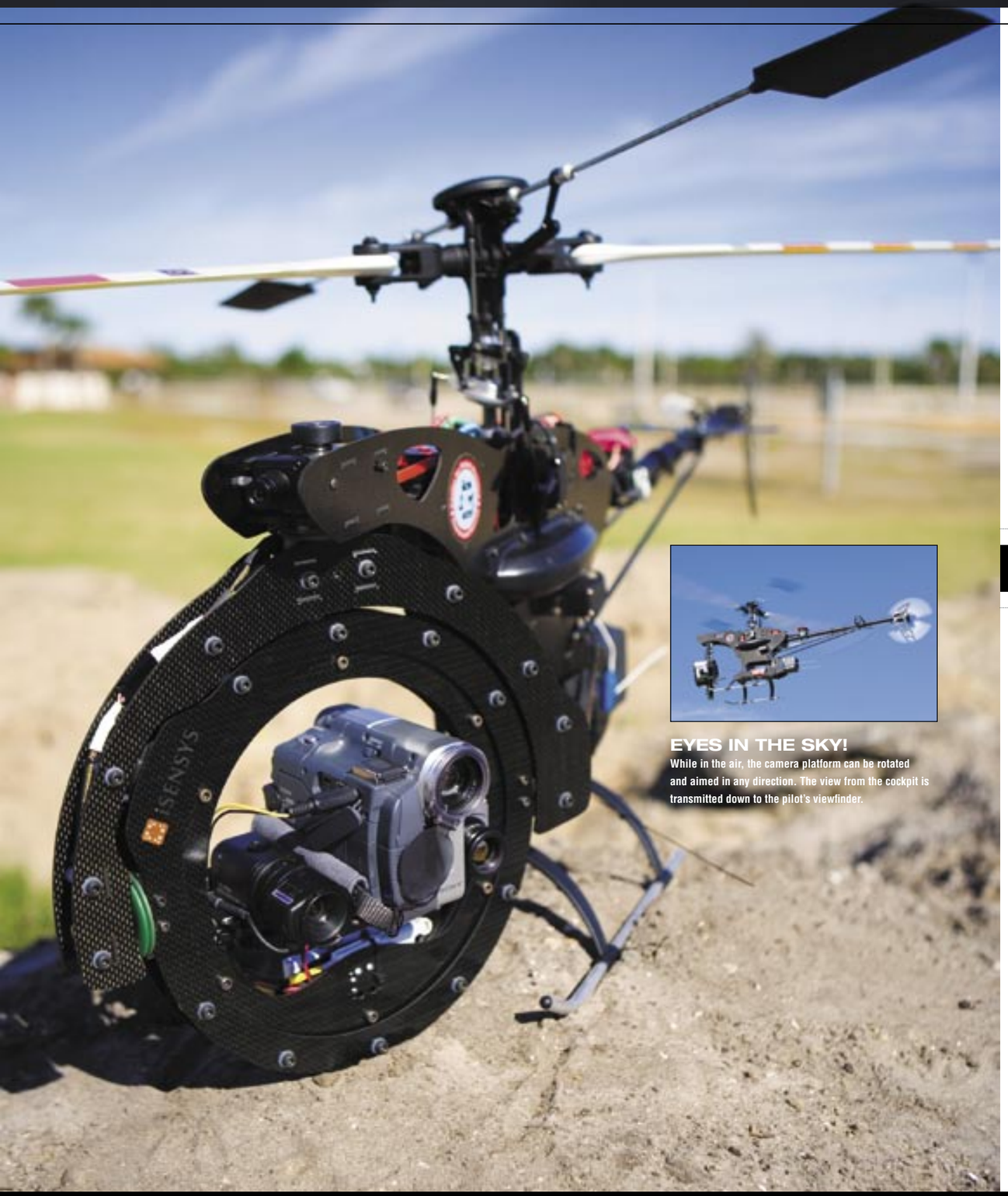

EYES IN THE SKY!
While in the air, the camera platform can be rotated and aimed in any direction. The view from the cockpit is transmitted down to the pilot's viewfinder.

HELI TECH:
iSENSYS IP3

OF COURSE RC HELICOPTERS ARE FUN TO FLY, rewarding, and a real hobby in the truest sense of the word. But they're also able to do some pretty remarkable things. In our last issue we gave you a glimpse of some beautiful aerial photography shot by Darrell Klassen. This issue's Parting Shot is a look at how RC helicopters actually have the ability to save lives in search and rescue operations. After last year's Hurricane Katrina hit, a small prototype of this unit, called the IP3, was used to help survey damage and find victims. Before next year's hurricane season, crews will have the new IP3 at their disposal. The IP3 uses four cameras, one that gives a direct feed to the pilot for his/her use in flying the helicopter. A small camcorder records flight while two different infrared cameras relay thermal information and night vision when needed. The gimbal allows the cameras to be pointed in nearly any direction.

We had the opportunity to ask a few questions of Chandler Griffin, the designer and CEO of iSENSYS, makers of the IP3:

RC HELI: Where did the idea come from? Was the designer a helicopter hobbyist who thought "hey, that would be a good idea" or was it "we have a need, how can we fill it?"

CHANDLER GRIFFIN: The idea came after our first successful deployment into the field just after Hurricane Katrina made landfall in Mississippi. We were using a small prototype platform with the Align T-Rex as a foundation. Although that platform was very successful and is still in use, we learned quite a bit about what more was needed to be even more beneficial to the cause. To further direct our development, the Center for Robot Assisted Search and Rescue (CRASAR) and the National Science Foundation (NSF) requested we develop something to perform surveys of multi-story structures damaged during the hurricanes. Of course, during that development we kept our eyes and ears open to any industry or commercial applications.

I noticed the frame looks custom for the situation, is the rotor head from a helicopter we might recognize?

The frame is indeed custom, but the heart of the platform is the Mikado Logo 14, 20, and/or 24. The frame holds the ability to swing anything from 550 to 710 mm blades, depending on the application, flight duration, and payload requirements. We could not find a frame that seemed to be engineered exclusively around a gimbal, so we designed our own. Then, during development, we came up with the idea to make different sized gimbals, each removable and easily interchanged in the field. Finally, some new ideas have arisen, where we can mount deployable items (such as acoustical sensors) in place of the gimbal.

Where has the unit been successfully used?

CRASAR and the NSF deployed us to Biloxi and Gulfport, Mississippi in late November. We flew 3-6 batteries per day, comprised of very short 'hops' to image our target. We found it was much more efficient to make several short flights, rather than one continuous flight, so that we could converse and check what we were capturing. Doing so, we were also able to photo document many more points of interest to the structural engineers. Most of the flying was done in very close proximity to the building (maybe 10-20 feet standoff), and at altitudes ranging from 20 to 300 feet. I have some example photos if you are interested. And, of course, we have since used the platform in other US&R trials, typical AP applications, etc.

What's the cost and availability?

Each platform is custom built for the application where it will be utilized. If you only need IR or FLIR imaging sensors, we give you a smaller gimbal and much longer flight duration. If you want to drop something, we design a system around your payload (iSENSYS will never allow weaponization of its platforms). If you want to perform very high quality AP, we outfit the unit accordingly, even up to autonomous flight control for altitude and position. Thus, you can see how the price can vary widely, but a general idea is in the $5,000 to $10,000 USD range for the platform itself. We are available to provide custom platforms within a month or two after assessing and quantifying the application. This particular unit, the IP3 (Imaging Platform 3), was conceived, designed, machined, and assembled within a two week period, just before the deployment into Biloxi and Gulfport.

How long did it take to develop?

We spent most of the Thanksgiving holiday building the platform and finished soldering the last of the electrical system in the RV on the way to Biloxi. Its maiden flight was at a damaged casino in Gulfport. Of course, we had a lot of prior experience with the Logo 14, a helicopter we put through its paces before we ever settled on its mechanics as the foundation.

What's the eye piece for on the photo shown?

The platform can carry several imaging sensors at one time (the most we have mounted at one time is 8). But, normally there is one type of camera in the gimbal, and a fixed position pilot camera in the frame. From our experiences in the field, we knew we needed something to help us fly more from a cockpit view than straining to see the helicopter at 300 feet up. So it became clear to install the pilot camera. Then, after dropping a lot of LCD screens in the mud, or not being able to see the screen clearly in bright daylight, we went to eyeglass mounted LCD screens. When we did, our piloting abilities blossomed, and gave the platform even more capability. And if you can imagine standing in the rubble of a demolished building there isn't much place to sit down. So, we came up with the backpack idea to keep us mobile and the gear safe.