Constant Hawk Versus Angel Fire Deathmatch

October 12, 2007: There's a turf war going on between the U.S. Air Force and Army over which new aerial surveillance system the U.S. Marines should use. The army is pushing its Constant Hawk system, while the air force is offering a somewhat similar system called Angel Fire. At least that's how it's been portrayed in the media, but there's much more going on.

Angel Fire uses wide angle, high res (11 megapixel) cameras mounted in aircraft, along with streaming the live video to hard drives. This system is basically airborne security cameras for large areas below. The marines (and any ground troops, actually) like this because it allows you to go back and look at what led up to a roadside bomb attack, ambush or whatever. The resolution is half a meter, so you can make out vehicles and people. The air force have a working prototype of the system up and running, and marines who have tested it in training exercises are eager to use Angel Fire in a combat zone.

The army system, called Constant Hawk is an image analysis system that's basically just another pattern analysis application. Not really comparable to Angel Fire at all. However, it's been a very successful system. The army named Constant Hawk one of the top ten inventions for 2006. The army does this to give some of the more obscure, yet very valuable, developments some well deserved recognition.

Pattern analysis is one of the fundamental tools Operations Research (OR) practitioners have been using since World War II (when the newly developed field of OR got its first big workout). Pattern analysis is widely used on Wall Street, by engineers, law enforcement, marketing specialists, and now, the military. Constant Hawk uses a special video camera system to observe a locality and find useful patterns of changing behavior. Some of the Constant Hawk systems are mounted on light aircraft, others are mounted on towers or other ground structures. Special software compares photos from different times. When changes are noted, they are checked more closely, which has resulted in the early detection of thousands of roadside bombs and terrorist ambushes. This has largely eliminated roadside bomb attacks on some supply convoys, which travel the same routes all the time. Those routes are also watched by Constant Hawk. No matter what the enemy does, the Hawk will notice.

Constant Hawk, like most geek stuff, does not get a lot of media attention. Mainly it's the math, and TV audiences that get uneasy watching a geek trying to explain this stuff in something resembling English. But it works, and the troops want more of it. The troops like tools of this mainly because the systems retain photos of areas they have patrolled, and allows them to retrieve photos of a particular place on a particular day. Often, the troops returning from, or going out on a patrol, can use the pattern analysis skills we all have, to spot something suspicious, or potentially so.

But now the media are trying to portray Constant Hawk and Angel Fire as two systems competing to do the same job. Not so. They both take pictures from on high, but the two systems perform different functions. What is going on here is completion for scarce research and development money, and the air force effort to gain overall control of all UAVs. If Angel Fire got the money it wanted, Constant Hawk might be in danger of getting shut down (as duplication of effort), and the air force would then have a stronger argument for taking control over medium size UAVs (their own Predator, plus the army Hunter and Shadow 200). Angel Fire would require the use of many UAVs of this size, and the air force could argue that the army no longer needs UAVs of this type because Angle Fire does the recon job. Or if they do need one, they can call the air force. The army very much wants to control its own UAVs. The marines like the idea of the air force giving them support with medium size UAVs that the marines don't have and can't afford. The marines have a few elderly Pioneer UAVs they scrounged from the navy, and are always looking for inexpensive replacements. Angel Fire suits the marines just fine.

Army troops would like Angel Fire as well, but not at the cost of losing control over their current UAV force. The army also doubts that the air force would come up with the hundreds of millions of dollars needed to deploy Angel Fire over large chunks of Iraq and Afghanistan. Constant hawk got $84 million this year, and Angel Fire got $55 million. This entire affair is another budget and turf battle deciding what the troops will get, not what they really need.