ECN Roundtable - Aerospace and Aviation

In this month's Roundtable, we ask our guests about the impact of military RPV tech on the development of civilian systems. Participants include Dan Jones from Incremotion, John Jovalusky of Qspeed Semiconductor, and Emilie Kopp of National Instruments.

John Jovalusky, Qspeed Semiconductor (www.qspeed.com [1])

Just as the U.S. mission to put men on the moon spawned a host of technological inventions that had an unforeseen and unimaginable impact on our daily lives, so the development of remotely piloted vehicles (RPVs) will likely have similar effects. Just take a look at any modern factory and you will see robotic workers of various kinds. In many regards, it has probably been the successful use of robotic systems in the civilian world that prompted the military to consider their use in high-tech warfare machinery.

Additionally, when you consider the reduced cost of an aircraft that does not require human life support systems aboard, it only makes sense that the civilian world–especially as we struggle to extricate ourselves from the most severe recession in 80 years–will jump at such opportunities to remain cost competitive. After all, in a free market economy, being competitive is often synonymous with staying in business.

Lastly, as the specter of liability lawsuits still strikes fear into the hearts of corporate executives, having human operators in safe locations that are removed from the potential dangers that come from being in the actual vehicle that they are piloting may be the greatest incentive of all. Reducing insurance costs could be the financial factor that outweighs all others and rapidly drives the adoption of RPVs in the civilian sector.

Emilie Kopp, National Instruments (www.ni.com ***[2])***

Commercial technology has frequently been driven by innovations from the military and vice versa. Thus, the recent push in military robotics most certainly influences the robotics industry across the civilian domain. Consider Unmanned Aerial Vehicles (UAVs): these robots can serve as the military eyes and ears in the sky, helping provide strategic surveillance information about identified and possible threats. They can fly undetected at extreme heights and see things humans cannot, using a variety of sensors like thermal cameras to detect things unseen to the naked eye.

These very same aircrafts are now being contracted in the civilian domain for similar purposes. They are patrolling borders in Texas, capturing criminals in Liverpool, and gathering o-zone measurements for atmospheric weather research in California.

But beyond repurposing these sophisticated, fully-deployed drones for domestic operations, many civilians have been personally impacted by the additional attention to military robotics and have been inspired to join in on the fun. Simply put: robotics is cool. As robotics development technologies become more accessible, we will see more and more innovations and resources from hobbyists and enthusiasts. Blogs such as “Building a Quadrotor Helicopter” on NI Developer Zone Community can literally step you through design techniques, control theory and parts lists for building your own UAV to take flight.

Dan Jones, Incremotion (www.incremotion.com ***[3])***

One major problem with RPVs of any kind involves the power source. This is not a significant issue with fossil-fuel vehicles, on the ground or in the air, but the use of electric power in civilian RPVs will face the same hurdles as battery- or fuel-cell-driven devices face in the military. The research that the government and industry is currently pursuing in the areas of power efficiency and energy storage density

will provide significant dividends for any commercial effort.

Typical electric vehicles have a range of only a hundred or so miles, which for a Californian like me isn't far enough at at all to be useful for any real applications. Effective range would be especially important to law-enforcement or environmental monitoring aerial RPVs that would have to spend hours and/or days on station. Unfortunately some of the very research that would have yielded results has been slowed due to funding issues in the tight economy. As the economy recovers, the funds will return and advances will continue to be made.

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