

General Dynamics Tests Out 4-Rotor Copter Drone

by Gerald Scott
Editor
U.S. Auto Scene

Although General Dynamics Land Systems has its own Robotics subsidiary in Maryland, the mothership in Sterling Heights is tinkering with unmanned vehicles all the same. At the mc2 lab open house recently, GDLS had a new four-rotor helicopter about the size of a kid's toy on display, but the mini-copter isn't for amusement. It was built for battlefield "situational awareness," a small UAV (unmanned aerial vehicle) that could launch about 1,000 feet in the air and give a brigade commander hover-and-stare capability - allow him to see over the next hill kind of awareness. "They store in these tubes (built into a vehicle), electric-powered, fly about a half-hour and it'll go out about a half-mile under control," said Christopher Cardine, GDLS chief scientist. "You've got a little electro-optic device on it that it carries (to return an image). It

gives you enough remote control - right now, we've got it on a cable, but it actually works off of radio. "So it's very small, very cheap, it's not (a full-sized Predator drone). What you'd use this for . . . cruise around on there, you wouldn't use it on the move a lot, but it looks down the road a little bit. "You carry a multitude of them so that while one is recharging its battery, you've got another one to launch out. "You can put maybe three on each vehicle so (that you have flexibility)." A vendor called Leptron in Utah builds the four-rotor copter drone for GDLS and the military contractor had it on display - along with the large vehicles it typically builds for the Army - at the recent open house. Note that prior to 9/11, the Army had said that it had maybe 50 robots and unmanned vehicles in its global inventory, and now, after wars in Iraq and Afghanistan, it has 10,000-plus robots and self-propelled and directed vehicles.

The four-rotor design, Cardine said, lends itself to stability in flight for the small drone. "One of the big advantages to the four-propeller design is that it's very stable," he said. "The kids (young soldiers) can fly them pretty easily. "There was actually a soldier in Afghanistan that had his parents sending him toy trucks, dump trucks, and they put rocks in them driving them down the path trying to pre-ignite mines. "One of the new Army requirements is that they're looking for robots that weigh as much as humans . . . that are expendable. In reality, they just need a 'dumb robot' that weighs as much as a human that will set the pressure plates off (on a landmine or IED - improvised explosive device)." The small helicopter drone, then, which is only in the experimental phase, gives a field commander one more tool to increase situational awareness on a battlefield. "This is a reconnaissance type of robot," he said. "What's interesting about these things

is that they're below the threshold of a Global Hawk that the Air Force and CIA use," he said. "The question is, how can you make one that's cheap enough and expendable enough that you can afford . . . to give grunts control. That you don't have to give it too much 'care and feeding' and you don't get too upset if you lose one because you're going to lose these things like mad (in combat situations). "You're accidentally going to fly it into a tree because you're concentrating on something else. Right now, it's an experiment. "The other day, I had my laser (pointer) with me and you can point that at the armored vehicle in the room next door and you can see the (laser dot) on the image that the drone helicopter returns. "I'm the chief scientist, so I get to play with all the cool stuff around here. I'm a retired colonel . . . I was an armored officer, so I actually got to use the toys (prior to retiring from the military and joining General Dynamics)."

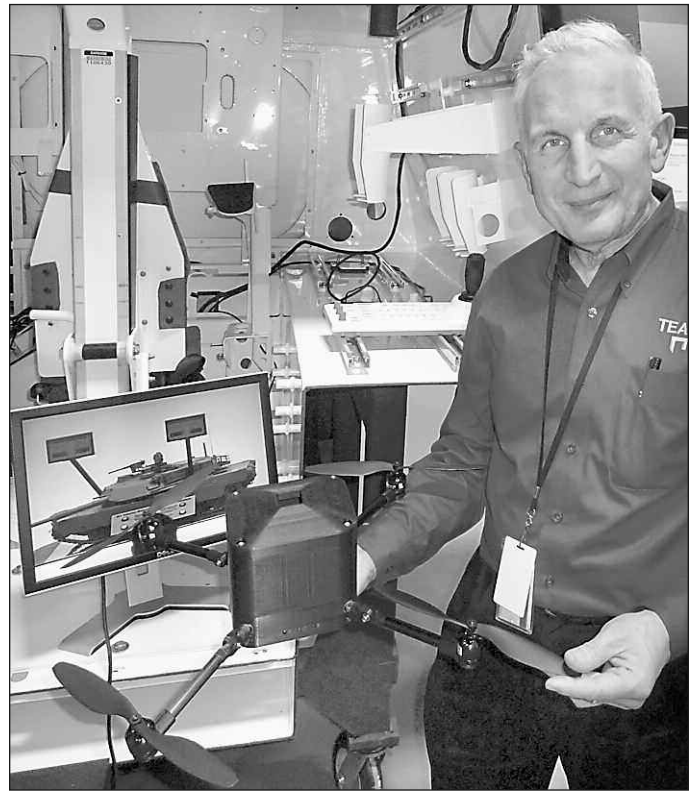


PHOTO: GERALD SCOTT
General Dynamics Chief Scientist Christopher Cardine demonstrates the supplier's experimental helicopter drone - what looks like a four-rotor toy is designed to fly above a military unit to give it immediate "hover and stare" capabilities.

Ford Vertrek Concept Tests Waters for Global Sales

SHANGHAI, China - Ford's vision for a sleeker, sportier and more stylish compact sport utility vehicle (SUV) makes its Asian debut at Auto Shanghai 2011. The Ford Vertrek concept previews the company's ambition for a next-generation, global compact SUV that could lead the industry in both design and fuel efficiency. The Vertrek concept is based on Ford's global C-segment platform, which includes the all-new Ford Focus range that will go into production in China in 2012. It represents the vision of the company's top design and engineering talent on how best to attract and satisfy future sport utility vehicle customers around the world.

Boost engines deliver fuel economy gains of up to 20 percent and reduction of CO2 emissions of up to 15 percent, compared with larger, less efficient engines. In addition to turbocharging with direct injection, Ford powertrain engineers have enhanced EcoBoost's technology capabilities by adding variable valve timing and precisely controlling all aspects of the engine. Ford has at least 125 patents on its EcoBoost technology. Ford Vertrek concept features the highly efficient 1.6-litre four-cylinder Ford EcoBoost engine, giving the vehicle the power of a larger engine yet delivering significantly better fuel economy and lower CO2 emissions. By 2013, 80 percent of Ford's global nameplates will have an EcoBoost option.

Another key enabler of enhanced fuel efficiency is the Ford Auto-Start-Stop system. This system automatically shuts down the engine when the vehicle is idle - at a stoplight, for example - and quickly restarts the engine when the driver wants to move off. An Auto-Start-Stop system can reduce fuel consumption and CO2 emissions by up to 5 percent in mixed driving conditions. In city driving and in heavy traffic with frequent stops, the savings could increase to as much as 10 percent. The advanced new Ford Auto-Start-Stop system has been carefully designed with customer comfort in mind, providing consistent starting and stopping performance that is smooth, quiet and seamless, requiring no changes in driver behaviour.

Owner Takes 1932 Ford Literally Around World
NICHOLASVILLE, Ky. (AP) - Clay Miller and Mark Miller pulled out of Nicholasville on Monday morning, driving a hand-built 1932 Ford coupe, bound for Paris by way of New York and Beijing. Just a nice, casual drive across the United States and parts of China, Kazakhstan, Russia, Latvia and several other Asian and European nations, with maybe a trophy waiting for them at the Eiffel Tower sometime around July 24. The Millers are competing in the 2011 World Race, an automotive competition commemorating The Great Race of 1908, which also took drivers from New York to Paris on a route stretching around the globe. The Millers' "Car 54" Ford will be the only Kentucky entry among the 20-plus racers. The race started last Thursday morning from Times Square, with competing cars heading west for San Francisco. Then, they'll be placed on ships bound for Beijing. From there, it's a punishing transcontinental run for Paris and the finish line. The Millers are making it a real family experience. Clay Miller is driving, with son Mark Miller, 48, navigating on the run to Beijing. There, Clay's grandson, Blake Garrison, 20, will take over navigational duties for the final charge to Paris.

deliver. The starting point is creating an athletic stance for the vehicle, almost like a runner in starting blocks poised and ready to burst forward. Other key elements include dynamic lines and taut surfacing, again conveying muscularity and athleticism. "The Ford Vertrek concept is inspired by contemporary compact sport utility customers' expectations and aspirations," said Martin Smith, executive director, Design, Ford of Europe. "It unites stylish design, world-class craftsmanship and outstanding capability to present a fresh vision that we believe will resonate globally." The exterior colour is Liquid Platinum, chosen to bring out the strong sculpturing of Vertrek while stressing the sophistication and premium execution of the vehicle's personality. The Vertrek concept interior is lightweight and spacious and conveys all the expressive flair evident in the exterior. As the focal point of the interior, the instrument panel displays shapes and forms that are absolutely unique, and further demonstrates Ford's kinetic design language. The wing-like profile spans the cockpit and extends through the side glass into the rear view camera. The center console swoops into the interior, forming a central bridge that flows through the vehicle. The theme of sophisticated craftsmanship is evident throughout the interior, including the instrument panel wrapped in Dusk Gray leather, contrasted and cooled by the satin-tinted platinum tones of the center console. The fluorescent detailing comes as a surprising highlight. The execution of the four individual seats communicates sportiness and relaxation. The slim seats are clad in naturally tanned, velour leather, offset throughout the interior by the modernistic touch of neon red-orange fluorescent highlights - an intriguing combination of traditional and high-tech. Replacing conventional carpet, Vertrek concept incorporates handcrafted woven-leather floor materials. Functional elements on the steering wheel, doors, cluster and instrument panel have a polished, premium finish that demonstrates craftsmanship normally seen on premium products.

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When the engine shuts down, the electronic control unit immediately prepares the engine's systems for an instant restart. An integrated system of sensors is then used to detect when the driver performs an action that signals the intent to drive off, such as pressing the accelerator or clutch pedal. As soon as the driver prepares to move away, the engine starts quietly and almost instantly; it takes the system only around 0.3 second to fire up the engine. The process is nearly imperceptible and happens before gear selection is completed. To support the increased number of engine starts, the starter motor is upgraded with a high-performance electric motor and a stronger pinion engagement mechanism with reduced noise levels. Advanced battery technology is required to ensure the main vehicle battery copes with the frequent charge-discharge cycles common with start-stop operation. Additional technologies ensure the battery is kept charged in the most efficient way. A Smart Regenerative Charging system increases the alternator output when the vehicle brakes or decelerates. This converts the kinetic energy of the vehicle into electric energy without using additional fuel. The "free" electric current is used to recharge the battery, so it can be used by the electrical systems at a later stage. This could be when the engine is switched off during a stop phase but also can be when the generator is operating in a less efficient mode. The battery has an advanced management system that continually monitors its status and communicates with the Ford Auto-Start-Stop system, so that the regenerative charging feature can charge the battery in the most optimal way. The Auto-Start-Stop system knows how much battery charge is available, so that it can leave the engine running if the battery does not have a sufficient level of charge. Ford's global data shows that compact SUV customers increasingly use their vehicles for weekend getaways, making improved highway fuel economy a must. This highlights the importance of the aerodynamic design of the Vertrek concept, and led to the inclusion of an accessible, small-displacement internal combustion engine in the vehicle rather than a hybrid or electric powerplant that might be more attuned to city dwellers. "Increased fuel economy, especially outstanding highway fuel economy, is what these customers want because they are active on the weekend, taking trips and seeking new experiences," Davis said. "They want their vehicle to look good, drive well and use less fuel." Detroit audiences got a view of the Vertrek at the 2011 North American International Auto Show at Cobo Center back in January. The Vertrek on display there was well received by the public and critical press alike.

But never anything quite like the World Race. He said he's been told that most, if not all, of the 20,000-mile-plus route will be over paved roads. But he aims to be prepared, just in case. The 1932 Ford, a three-window coupe powered by a 1948 Ford flat-head V8 engine, has all kinds of storage bins crammed with extra parts and equipment to meet just about any conceivable need. There's an extra fuel tank and extra fuel pump, and even an air compressor for fixing flat tires. The car carries a GPS system, but Miller said he might have to rely on paper maps for some of the more remote parts of the race. The Millers plan to post regular updates and videos on their Web site - millergarrison.com - so people can follow their progress around the world.

"This concept supports the idea of a 'grab your gear and go' capability, but does it in a very sophisticated way. It blends capability and great design and craftsmanship." The Ford Vertrek concept combines the best of Ford's kinetic design styling and driving quality with outstanding levels of cargo space, trailer towing and off-road capability, promising a vehicle that meets the needs of next-generation compact crossover customers around the world. The sleek appearance of the Ford Vertrek concept has been honed aerodynamically to help support the programme target of class-leading fuel economy and low CO2 emissions and to complement the high-tech powertrain solutions Ford envisions. Ford's global C-segment platform allows for the efficient creation of vehicles that address consumer tastes around the world. "In markets around the world, consumers are very clear about what they want in a compact SUV: strong design, great driving quality, smart technology and the capability to help get them to places they love to be," explained Davis. "And this holds true no matter where they live - in the U.S., Europe, China - these are global trends."

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development vehicles. From Ford facilities at Merkenich in Germany and Lommel in Belgium to the famous Nürburgring circuit and lesser-known roads in Wales, Essex in the UK and in the south of Spain, he goes to great lengths to help ensure Ford's C-segment vehicles offer leading dynamic performance. "Vehicle dynamics development is not about helping lunatic drivers to go even faster through corners, it's about ensuring predictable, safe and confident driving - even for a novice - when performing extreme accident avoidance maneuvers," he explained. In fact, for Püttschler, this element of Ford's philosophy also holds some personal satisfaction. "My eldest daughter, who is 20, bought a Ford Ka and she loves the agility, predictability

and feeling of confidence she gets from the vehicle," he said. "Her novice comments make me very proud to work in the area that helps to create this feeling of predictability and confidence in her." Püttschler has two daughters, aged 20 and 17, and lives in the Eifel region of Germany. He cites the Ford Mustang in the film, "Bullitt," as his favorite car ever featured in a film, and puts the Mustang and its European "little brother" - the Ford Capri - as his top Ford vehicles. Püttschler enjoys nothing more than driving his own 1982 Ford Capri Mk3 through the mountainous area near his home. He says friends would describe him as an "automotive enthusiast" or "petrolhead." He also believes they often ask: "How can a nearly 50-year-old man put car posters up in his corridor?"

Ford's Püttschler Named 'Dynamicist of the Year'

CONTINUED FROM PAGE 1

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unemployed and/or a veteran status; • available Monday through Thursday 8 a.m. - 3 p.m. for the six-week course; • have high school level computer and math skills; • be able to lift up to 50 lbs. and capable of standing for a minimum of 4 hours at a time; and • have a minimum of two years experience machining on manual mills and /or lathes. To apply, contact Barbara Gray at 313.845.6335 or via email at bjgray1@hfcc.edu. The first class begins May 9,

will account for more than 2 million units of sales, providing Ford with unprecedented economies of scale and an opportunity to offer customers around the world an array of new technologies and product features usually reserved for premium vehicles. The global compact SUV segment has shown growth since 2009, led by China and the U.S. The market in China is projected to increase 60 percent by 2011 compared with 2009. The sporty and sleek Vertrek concept builds on Ford's global kinetic design philosophy. This distinctive and continually evolving design language is rooted in creating cars that appear to be in motion even when stationary, while at the same time communicating the engaging driving experience that Ford cars

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DEARBORN - Henry Ford Community College (HFCC), in partnership with Macomb Community College and the U.S. Dept. of Labor, will offer a FREE Computer Numerical Control (CNC) Operator Training Program for unemployed workers and veterans in southeast Michigan. This six-week accelerated training program, funded by a grant from the U.S. Dept. of Labor's Employment and Training Administration, will teach students the basics of CNC machine tools through practical usage and operation in HFCC's CNC laboratory. In

addition, this program will cover operations, tool set-up and work set-up of both CNC turning and milling Centers. HFCC and partners will deliver instruction through lecture and extensive, hands-on laboratory activities. Following successful course completion, students will be ready for both the written exam and laboratory activities of the CNC Level 1 certificate endorsed by the Haas Technical Education Council. Those interested in the CNC Operator Program must be able to provide proof of

unemployed and/or a veteran status; • available Monday through Thursday 8 a.m. - 3 p.m. for the six-week course; • have high school level computer and math skills; • be able to lift up to 50 lbs. and capable of standing for a minimum of 4 hours at a time; and • have a minimum of two years experience machining on manual mills and /or lathes. To apply, contact Barbara Gray at 313.845.6335 or via email at bjgray1@hfcc.edu. The first class begins May 9,