

UNMANNED SYSTEMS: ODF OFFERS SMALL-UNIT BATTLE NET

Wednesday September 09th 2009, 12:13 am
Filed under: Robots!, David Axe, Jason Reich



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The Israeli Defense Forces tank brigade has met stiff resistance in the city center. What was meant to be a lightning-fast thrust through an insurgent stronghold, has devolved into brutally slow, bloody, block-by-block fighting. The battle pits tanks against missile-armed hunter-killer teams, attack helicopters against rocket-wielding ambushers and infantry fire-teams against squads of heavily armed insurgent fighters.

In combat like this, in a dense urban center, a handful of tank battalions can get swallowed up pretty fast. For the infantry platoons tasked with guarding the battalions' flanks, the situation is grim. There's way too much terrain to cover for just a few dozen men — and the battlefield keeps expanding, by the minute.

For reinforcements, the platoons dig in their backpacks and load-bearing vests. The outnumbered, overwhelmed soldiers activate tough, lightweight robots — all built by ODF Optronics in Tel Aviv — to add eyes and ears to their own, while also cutting through the escalating radio chatter that threatens to drown out any pleas from lower echelons to higher.

This scenario is fiction, of course, but it's fiction that ODF, founded in 2000, is working hard to make real. ODF's family of platoon-level, networked, robotic sensors aims to deliver much improved situational awareness to small units, without overburdening local commanders or breaking the customer's budget. Some pieces of the network are already in daily use. Others are still in development.

ODF has sold components of the network to the IDF, the U.S. Marine Corps and U.S. Special Operations Command, among other customers. The company is aiming to export the greater network, as a package.

“Micro-Tactical” Robotics

ODF’s small bots are all highly automated and communicate wirelessly, using Internet Protocols (IP). “When you flood the battlefield with analog systems such as radios, you get more and more noise,” Yosi Wolf, a former Israeli army special forces captain and current ODF Vice President for Robotics Development, told *Unmanned Systems*. “Digital systems work exactly the opposite,” Wolf said. “The more sensors you add to the mix, the clearer the tactical picture gets — and there is less radio chatter, as well.”

The idea is to saturate a platoon’s sector — a city neighborhood or a village — with potentially “hundreds of sensors per square kilometer.” That might seem like a lot. But “with sensors small enough and cheap enough, it is easily attainable,” Wolf said.

Maj. David Patt, head of the Recon Systems section of the IDF’s Urban Warfare Division, described the ODF bots’ role as “techno-tactical” or “micro-tactical,” meaning they’re meant for the smallest tactical actions, such as “opening a zig” — an Israeli term for scanning around a corner or through a doorway. Patt’s goal is to use these robots to “synthesize the collection and analysis capabilities” of the basic soldier, without “overwhelm[ing] the platoon commander” with extraneous information, he told *Unmanned Systems*.

In thick urban fighting, simplicity saves lives — a truism ODF recognizes. A soldier simply turns on one of the company’s bots, pitches it down an alleyway or into a window, and in seconds the device has logged onto an ad-hoc local network “using the latest WiMAX cellular technology to control hundreds of individual IP addresses,” according to Wolf. Video and audio quietly streams into the platoon leader’s ruggedized laptop computer, where he can choose bits and pieces to send up to company, battalion or brigade.

With dozens of relatively inexpensive robots, priced at just a few thousand dollars apiece, the small units have doubled the area they can monitor. A battlefield that before was overwhelmingly large and chaotic, has become figuratively smaller and more orderly, thanks to the judicious application of high technology. For this reason, 2nd Lt. Niv Pe’er, a robotics specialist at the IDF’s School for Counter-Terror Warfare, foresees small robots becoming an indispensable part of the modern infantry unit. “I can see this field growing,” Pe’er told *Unmanned Systems*. “In my opinion, there will soon be a robot operator in every platoon, just like you have a medic, machine-gunner or radio man.”