# Code-makers

## Software is the brains behind the star players of this U.S. Army program to give soldiers a battlefield edge

By Peggy Mason and photos by Bob Ferguson and Rich Rau



The hardware is pretty cool.

Small unmanned ground vehicles, or SUGVs, resembling *Wall-E* in the 2008 Disney-Pixar film, that surreptitiously enter buildings, caves and tunnels to perform dangerous reconnaissance missions.

Unmanned aerial vehicles that hover for hours over a target to provide critical surveillance to soldiers positioned out of harm's way.

These are just some of the players in the U.S. Army Brigade Combat Team Modernization (BCTM) program, the ones that get most of the attention. But the real star of the show is the underlying software that runs these various platforms and allows them to connect with one another.

Without that software, nothing would work. That's what is essentially the brains of these platforms and what allows the hardware, soldiers and commanders to connect with one another across the all-important secure network that's the centerpiece of the Army program.

The amount of information contained in the software package that makes all the cool technology work in the program—for which Boeing is the prime contractor—is massive. This is no off-the-shelf software that can be downloaded within minutes into a home computer. The quantity of information, in fact, is closer to that found in the Library of Congress, the largest library in the world, with millions of books and other resources.

And the software is written not just by Boeing but by software engineers from seven suppliers: Northrop Grumman, Honeywell, Overwatch, General Dynamics Information Technology, Raytheon, Lockheed Martin and Textron.

The biggest challenge with having software come from multiple sources is getting all the lines of code to work with one another without crashing. And that's the job of Boeing's System of Systems Integration Lab, or SoSIL, located in Huntington Beach, Calif.

"The integrated hardware and software being created at the SoSIL for our Army customer is key to ensuring that the BCTM capabilities are able to provide real-time situational awareness to soldiers in combat," said Roger Krone, president, Network and Space Systems.

During the initial software integration process at the System of Systems lab, engineers eliminate bugs and glitches in the different pieces of software and mesh them into a smooth-running product. Once the bits and pieces of software work seamlessly together, it's on to Phase 2, "where the real hardware meets the real software," said Kirk Reher, director of Boeing's Network Systems Integration.

"When it's all pulled together, we have the Integrated Battle Command software," Reher said.

Next stop after the lab is the White Sands Missile Range in New Mexico, where soldiers rigorously test all the components.

Early summer tests at the range demonstrated that the network works as it is supposed to, according to Mike Laske, a hardware and software integration manager at Boeing.

And that's very gratifying for Boeing employees such as Shaun Goodger, who works largely behind the scenes of the program as a software and hardware integration engineer.

"We get to see in real situations how our work helps soldiers do their job on the front lines," Goodger said. "It's so gratifying to see it all in action and to know we've provided a good, reliable product."

Starting in 2011, a team led by Boeing is scheduled to equip the Army's first Infantry Brigade Combat Team with these network capabilities. ∎

*margaret.a.mason@boeing.com*

**PHOTOS:** Software engineers at Boeing's System of Systems Integration Laboratory integrate software from seven companies for the U.S. Army's Brigade Combat Team Modernization (BCTM) program. Clockwise from top middle: Boeing's Leona Wong (left), software integration lead, and Will Lopez, systems engineer; U.S. Army soldiers operate a command post at White Sands Missile Range, N.M., where the capabilities of the Army's BCTM program are tested in realistic scenarios; Ryan Andersen (left), Army test engineer, and Boeing's Tin Vu, software tester; Boeing's Miukei Siu (left) and Raytheon's Girma Kassa, software engineers on the BCTM program; Boeing's Matt Viss (left), design and analysis engineer, and Marco Corrado, software engineer.