

WHITE PAPER

Battlefield Advantage: How Does Technology Boost Situational Awareness for Warfighters?

➤ Today's battlefield is teeming with sophisticated technology to help warfighters execute their tactical missions more effectively.

In the 21st century, technology plays an important role in developing, improving and enhancing situational awareness. For warfighters, having the proper tools and technology to keep them connected, secure and in control is key. Increasingly, the eyes and the ears of troops on the ground are getting a boost from battlefield tech by bolstering overall situational awareness.

For example, mobile applications that provide state-of-the-art geospatial data and constantly-updating real-time intelligence feeds can be easily downloaded onto ruggedized mobile devices that work in extreme environments. These apps give warfighters an enhanced picture of the combat environment and can also be used in tactical mission planning.

In addition, drones and other autonomous vehicles perform sophisticated reconnaissance and can carry out strikes. Wearable devices collect operational data and monitor soldiers' physical conditions and enable them to track adversaries in the

field. Augmented reality and virtual reality solutions can take situational awareness to the next level – including automatically detecting enemy movements.

To put these powerful pieces of battlefield technology to work, warfighters need reliable and secure mobile computing solutions that can perform in the harshest conditions.



Use Cases: Panasonic in the Field

Panasonic has been placing purpose-built mobile technology aimed at improving situational awareness for warfighters in the hands of soldiers for decades. Panasonic TOUGHBOOK® rugged laptops, tablets and handhelds provide critical, real-time access to military apps and data that can improve performance and effectiveness, but also save lives.

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Today, our rugged laptops are used in myriad ways throughout the Defense Department, from routine tasks such as digitizing maintenance orders to strategic and tactical uses such as weather forecasting and detecting gunshots.

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Jeff Henderson
Strategic account manager for Army and special services at Panasonic

Panasonic works closely with its military customers to make products that fit specific mission sets. Currently, a large DOD program office is directly working with the company's product management team to tailor products to fit specific new use cases.

“We are very customer-focused, very mission-focused on how we engineer and customize the hardware and what options we include,” Henderson said. “We know that they need it to be as functional, durable and reliable as possible.”

+ Artificial Intelligence Advances Soldier Ability

On the data-driven battlefield, AI can help boost situational awareness by providing warfighters with real-time and actionable analysis, intelligence and information. One such example is the Army's Aided Threat Recognition from Mobile Cooperative and Autonomous Sensors, or ATR-MCAS, an AI-enabled system of networked air and ground vehicles that can identify potential threats. These vehicles have sensors that help them navigate within areas, classify and geolocate obstacles and potential threats. The system can also collect and distribute the target data, which can then be used to make recommendations and predictions based on the overall threat picture.

AI is also leveraged to analyze and process drone video footage and identify items of interest to warfighters. The technology allows for faster processing of full-motion footage, reducing the need for human analysts to sift through massive amounts of imagery to spot anomalies or items of interest.

In the near future, military leaders hope AI will up battlefield situational awareness not only by delivering more intelligence about adversaries but also predicting their next moves.

Tactical Planning and Maneuvers

There are a number of powerful military apps that can be downloaded onto Panasonic's suite of rugged devices.

Built by the Air Force Research Laboratory, the [Android Tactical Assault Kit](#), or ATAK, is a geospatial infrastructure and situational awareness app that facilitates information sharing and team coordination. When downloaded onto a rugged handheld device or tablet, ATAK provides warfighters with real-time tactical information feeds, analytics and visuals that can improve mission planning.

Designed for high-stress, hostile environments such as combat zones, troops can "see" each other in the field. ATAK can also help troops stay aware of dangerous or sensitive areas with virtual boundaries, or geofences. Movement beyond the geofence triggers an alert so soldiers can course correct.

The Panasonic TOUGHBOOK N1 rugged handheld device can be effectively paired with ATAK. For example, combined with the N1, ATAK can leverage an audio sensor to display where a gunshot came from and its trajectory. Meanwhile, the system displays a visual of where all troops are located on the map, Henderson said.

[Nett Warrior is an Android-based tool used by the Army](#); it's an integrated dismounted situational awareness and mission command system designed to be used during combat missions. The force-tracking technology is connected through secure, tactical radios and a smart rugged device that displays locations and tactical imagery. And KILSWITCH, which stands for Kinetic Integrated Low-Cost Software Integrated Tactical Combat Handheld, is yet another Android app used by the Marine Corps and Navy personnel to coordinate actions both on the battlefield and in the air.

The Air Force uses Panasonic rugged mobile laptops to provide personnel with critical weather information and strategic data on air speed, wind direction, humidity, cloud height and more, available through the Tactical Meteorological Observing System, or TMOS. The Air Combat Command turned to Panasonic for reliable rugged devices because consumer-grade devices weren't feasible in combat zones and other arduous conditions in missions around the world. With less equipment downtime, Air Force personnel can access the information they need even under the most extreme conditions.

"It always comes back to the root features of a TOUGHBOOK: These mobile devices can survive in combat environments, provide good communication features and are usable in different weather events," Henderson said.

Powerful computing capabilities, excellent displays, long battery life and exceptional durability keep warfighters connected to situational data and sophisticated software such as ATAK, Nett Warrior and KILSWITCH.

+ How Panasonic Secures Warfighter Communications

Protecting the data warfighters access on the battlefield is critical to maintaining a battlefield advantage. Panasonic takes a multipronged approach to ensure warfighter communications stay secure. Its engineering team incorporates features specific to DOD mission sets and even offers units in which all wireless communications are physically removed to protect data. Panasonic was the first rugged mobile device manufacturer to integrate built-in wireless LAN for secure, reliable communications.

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When we were designing products, we knew we needed to be able to check all those boxes, and they're designed to do exactly that.

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Jeff Henderson
Strategic account manager for Army and special services at Panasonic

UAV Surveillance Intelligence

Unmanned aerial vehicles or drones are also taking center stage on today's battleground. UAVs are used for intelligence, surveillance and reconnaissance missions, and can even carry out electronic attacks and strikes to destroy enemy defenses or communications.

Panasonic rugged laptops and tablets are used to pilot micro UAVs that boost situational awareness through surveillance. This year, the U.S. Army began using them with FLIR Systems' pocket-sized Black Hornet Personal Reconnaissance Systems, a miniature unmanned helicopter that transmits live video and still HD images.

"If I need to know what's 10 feet over that wall or what's on the second floor of that building, I can fly a micro UAV up to the area and view the landscape ahead on a tablet," Henderson said.

Larger UAVs are increasingly used to make sure warfighters have the right supplies at the right time.

"We're seeing more troops being resupplied by medium and large UAVs," Henderson said. "If you've got a company out somewhere where it's difficult to get to, I could just fly in one of those larger 7-foot long UAVs and drop more ammunition or whatever else these troops need."

Surveillance and reconnaissance information are critical to mission success. And the more warfighters have immediately available to them, the better decisions they can make on the battlefield.



+ Designed for the Battlefield

Panasonic TOUGHBOOK® products are designed to meet stringent military and other hazard durability testing criteria, including:

MIL-STD-810G

A set of tests that certify devices for a variety of extreme stressors and environmental conditions such as high-low temperatures, vibration, sand, dust, humidity and explosive atmosphere

MIL-STD-461F Ingress Protection

IP is an International Electrotechnical Commission testing standard for resistance to particulates and liquids. For example, IP 65 protects against water jets for up to 15 minutes

HazLoc Certification

A series of tests for protection against combustible dust, flammable gases and vapors in compliance to a variety of published industry standards

TOUGHBOOK®



Tech and the Future of Warfighting

With tech handling more and more data, wireless speed is critical for bringing that information directly to warfighters in the theater of operation. There is already movement within the Pentagon to transition to 4G networks — and 5G is just around the corner. Next-generation technology will, for instance, enable faster downloads of data-heavy video and imagery. A 5G connection could leapfrog the communications that exist today, Henderson said.

“If [5G] becomes five times faster than a 4G radio, not only would all those things move and flow through the battlefield more effectively but it could open new technologies — things we’re probably not even thinking about today,” Henderson noted.

As for other battlefield tech warfighters can expect to see in the future, Henderson predicts further deployment of imagery development and gunshot detection. He also forecasts artificial intelligence that looks for objects that resemble weapons or threats that will become incorporated into the warfighter’s toolkit, as well as surveillance tools that track enemy troop movement.

Henderson said it’s important to remember that while technology is critical to mission success, adding sophisticated apps, sensors and systems to the traditional battlefield toolkit must fulfill a singular purpose: They have to work for the warfighter.

“I think the biggest challenge is trying not to overdo it,” he said. “If we overload these guys with too much data, then the most critical piece of information could get overlooked.”

+ Virtual Reality Brings Real World Scenarios to Troops

Augmented reality and virtual reality help prepare warfighters for real-life battle scenarios. These technologies can help enhance situational awareness by simulating extreme situations and environments to ready soldiers for new missions. An immersive simulation of, for example, a parachute jump or a desert mission provides key context and locational awareness of situations that are otherwise difficult to reproduce.

One World Terrain, or OWT, is one of several key components of the Army’s Synthetic Training Environment, the next-generation system designed to let soldiers practice combat scenarios in any virtual simulation. OWT provides a 3D representation of the global operating environment, allowing units to practice combat scenarios in any virtual simulation on the planet. OWT works with the Army’s Integrated Visual Augmentation System, which includes HoloLens AR headsets.

A soldier in a tan helmet and sunglasses is crouched in a trench, looking at a Panasonic Toughbook laptop. The laptop is silver and black, with the Toughbook logo on the lid. The background is a rocky, wooded area.

TOUGHBOOK®

Panasonic TOUGHBOOK for Increased Effectiveness on the Battlefield

➤ Getting real-time information to warfighters that contributes to situational awareness is key to mission success and safety.

Panasonic rugged mobile computers are built to go wherever the call of duty requires and to make sure troops have the right data at the right time to make decisions.

Mobile applications can supply warfighters with real-time data, information and intelligence that improves situational awareness, but they need a technology backbone that can work in even the most difficult conditions. Panasonic rugged mobile computers are designed for the battlefield and rigorously tested to meet military specifications for durability and DOD security specifications that protect data and communications.

To learn more about how Panasonic rugged mobile devices can help warfighters, visit our Defense page:

<https://na.panasonic.com/us/industries/military>

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