



The Role of Mobile Solutions in UAS Deployments

Unmanned Aerial Systems (UASs) and robots are frequently deployed by military to improve situational awareness, perform recon, and even to deploy emergency rations, ammunitions, or other payloads. A critical part of every military UAS and robot system is the ground-based controller – handheld or laptop-based – that guides devices to where they need to be; collects video, thermal, audio, or other information; and safely returns when their mission has been completed.

This paper examines what goes into a successful UAS deployment, with a particular focus on the considerations for choosing the mobile device at the heart of each controller. It also includes a real-world case study demonstrating the importance of choosing the right mobile device for the job.

The Evolution of UAS

The growth in the market for UAS devices and robots is accelerating, with a recent report in Fortune indicating that the military UAS market alone could reach nearly \$22 billion by 2026. As battery technology and processing power continue to advance, so do the myriad uses for these remotely controlled devices. Today, UAS and ground-based robots are being used by the military for missions that include:

- Keeping personnel safe during the pandemic by acting as remote eyes and ears
- Performing surveillance whether across a room or across a city
- Improving the situational awareness and safety of personnel in the field
- Collecting intelligence data such as video, audio, and infrared heatmaps
- Delivery of supplies and armaments when critically needed
- Enabling real-time decision making based on data collection

There are a broad range of unmanned devices including large airborne drones or UAS, backpack or man-packable small UAS (sUAS) devices, and ground robots. One commonality between all these devices is the use of a human-operated controller responsible for navigation, data collection and processing, and visualization. Without a remote controller, most small drones could not navigate with the precision afforded by a human operator, making the controller the heart of the system.

Without a remote controller, most small drones could not navigate with the precision afforded by a human operator, making the controller the heart of the system.

The Heart of the Controller

Every UAS or robot controller has a mobile computing device – typically a tablet or handheld – at its core. The controller enables the operator to:

- Accurately control the unmanned aerial vehicles (UAVs) or robot device and navigate it to its target
- Visually display what cameras and sensors see and hear
- Capture and store collected intelligence and data for real-time or later processing
- Perform actions to enhance the safety and efficiency of teams in the field

The TOGA Project

The controller pairs with any UAS in the Army's FoSUAS, as well as unmanned ground vehicles that provide critical situational awareness, reconnaissance, maneuver elements and provide enhance force protection. Having a universal controller for a range of both air and ground unmanned systems allows more intuitive use and reduces the amount of training required for a portable solution.

At the heart of the UAS TOGA controller is a Panasonic TOUGHBOOK fully rugged tablet, customized with specific modifications to the hardware and software. By basing the solution on capabilities of the TOUGHBOOK device, the solution offers best in class COTS rugged tablets at an affordable cost. The result is a controller that can be used virtually anywhere, viewable under extreme outdoor lighting conditions and with both rain and glove-touch modes for reliable use regardless of the weather.

"The TOGA controller represents a major step forward for the Army's next generation of unmanned vehicles," said Thomas Rambo, Altavian CEO. "Altavian is particularly interested in the



Six Key Considerations for Choosing the Right Device

What type of device should controllers utilize? Although that depends on the specific needs of the device in question, there are certain considerations that apply across the board.

- 1. Device form factor.** The device form factor depends on its use and functionality. Where lighter handheld devices are better and more practical for field operators, larger laptop-based controllers are often used instead for controllers in longer range or remote deployments where the operator can be seated at a desk or with the controller in their lap.
- 2. Operating system.** The device must support the operating system (OS) that the controller manufacture demands for their software – or utilize a custom OS specified or modified to meet the controller software's special requirements.
- 3. Rugged durability.** Perhaps most importantly, the mobile device at the heart of the controller must be durable enough to withstand any environment in which it is deployed. For field operators this means using a rugged device that can

Perhaps most importantly, the mobile device at the heart of the controller must be durable enough to withstand any environment in which it is deployed.

operate flawlessly regardless of weather conditions and be readable under any lighting conditions from night to blazing mid-day sun. The device must continue to perform despite dirt, moisture, varied elevations, the vibrations of military vehicles and accidental drops. Rugged devices with military standards certifications (MIL-STD-810G) perform significantly better than off-the-shelf consumer devices—even those in a rugged case.

- 4. Reliability.** Critical missions such as surveillance demand ultra-reliable equipment that is easy to operate for long hours without breakage, overheating or other failure. Battery life must be sufficient to last for the duration of the mission.

TOGA as it aligns with our goals of Open Systems and Common standards. We're proud to be manufacturing a piece that represents not just a single program, but all of Army robotics."

As part of the UAS TOGA project, Panasonic worked with and supported several Federal System Integrators in their efforts to develop the controller for the US Army program PEO.



- 5. Processing power.** Depending on your specific use case, controllers must be powerful enough to process surveillance videos and display complex graphics and maps in real-time.
- 6. Connectivity.** Maintaining a reliable connection to the UAV or robot as well as to command is critical. The quality of the device and engineering design of the antenna module can make a huge difference in the reliability and reach of your connection.

Why Panasonic?

In a word, value. No UAS provider or operator wants their mobile device controller to be a point of failure. Panasonic offers TOUGHBOOK mobile devices in form factors that controllers need, with support for the OS of choice, rugged durability to withstand harsh conditions and reliable connectivity customized for each controller. TOUGHBOOK devices have the lowest failure rates in the industry and are 72% more reliable than other rugged devices (based on comparing device failure rates).¹

TOUGHBOOK value goes beyond the device. Panasonic works closely with customers in the way the project demands – with the military project office, UAS/UAV manufacturer, system integrators and contract owners – to ensure that all stakeholders have what they need for a successful deployment.

Panasonic doesn't make UAV or robot controllers. It just makes them better.

Learn More

For more information about how Panasonic mobile solutions support UAS, explore our [TOUGHBOOK Military Technology Solutions page](#) or visit the [Resource Center](#).

¹ Compares Panasonic actual data for TOUGHBOOK computers to data gathered by IDC on consumer and rugged laptops, tablets, and handheld devices and reported in [The Case for Deploying Rugged Devices in Your Organization](#). IDC (November 2021).



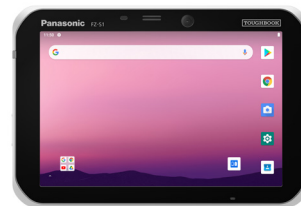
Keyboard Optional

TOUGHBOOK 33



Keyboard Optional

TOUGHBOOK G2



TOUGHBOOK S1

