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**TECH RECON**

# Rugged Laptops and Workstations Enable a Net-Centric Military

Rugged laptops and portable workstations have evolved to become the mobile user interface of choice for a variety of military systems. These help the U.S. military move toward the goal of a more network-centric mode of operations.

JEFF CHILD, EDITOR-IN-CHIEF

There's been a major upward trend in the military toward systems that require sophisticated graphical user interfaces. Often in the form of rugged laptops, workstations and display systems, this is where the warfighter gets the complex situational awareness data—maps, video, images and text—interfaced directly to military weapons platforms on networks. All that feeds into what the U.S. military dubs network-centric operations. The evolution toward a networked military means that every vehicle, every aircraft, every ship, every UAV and every soldier on the ground should have the capability to share data, voice and even video with almost any level of the DoD's operation.

One key use of laptop-level solutions leverages advanced video technology for situational awareness. An example along those lines is L-3's VideoScout family of interoperable video exploitation, intelligence and management systems (Figure 1). The systems are designed to capture, process and exploit video and telemetry from a wide variety of manned and unmanned airborne platforms, vehicles, ships and network-based video streams. Once data is received, VideoScout allows users to create derivative video files and still images, as well as annotate, geo-reference, store and share the resulting intelligent video with others across the battlespace. VideoScout helps both frontline tacticians and intelligence analysts quickly turn vast amounts of video data into concise, easily shared video intelligence to improve mission planning, execution and post-mission analysis.

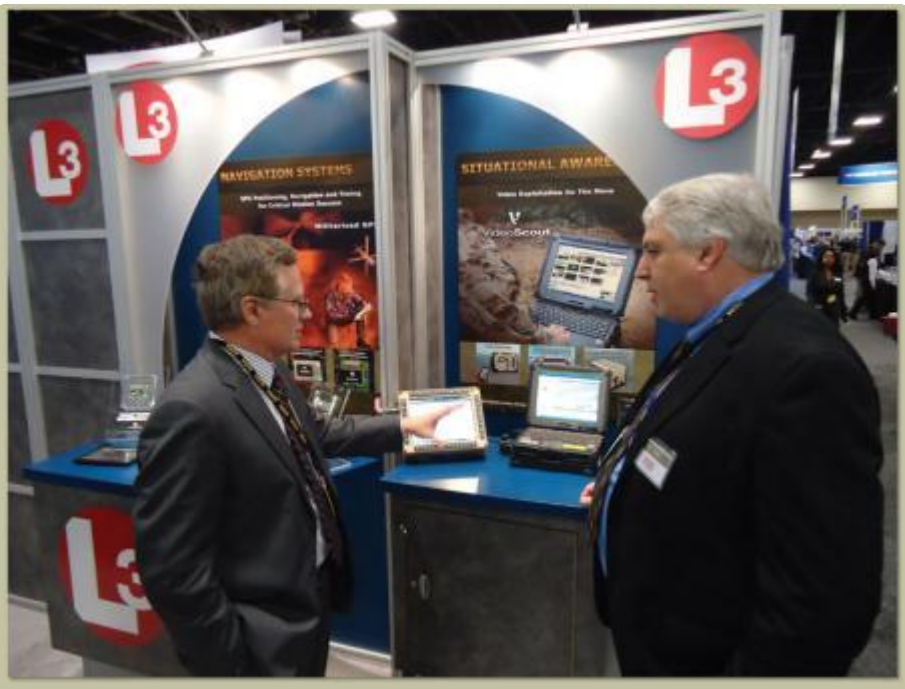


Figure 1
COTS Journal Editor-in-Chief Jeff Child is briefed on L-3's VideoScout family of interoperable video exploitation, intelligence and management systems. These devices can capture, process and exploit video and telemetry from a wide variety of manned and unmanned airborne platforms, vehicles, ships and network-based video streams.

Last October, L-3 Communications was awarded an indefinite-delivery/indefinite-quantity (ID/IQ) contract for its VideoScout systems. Provided on behalf of the Marine Corp Systems Command by the United States Navy, the contract provides for the purchase of new equipment, modifications of existing equipment and the development of new system enhancements. If all contract options are exercised, the total potential value of this four-year program is $85 million.

**Transportable Enterprise Class Computing**

Terms like server and workstation are often used interchangeably among these classes of products. For its part, NextComputing has in recent years expanded its line into ever more rugged deployable types of solutions. Last December, NextComputing unveiled its latest mobile server and portable workstation, the Radius EX Plus (Figure 2). This transportable computer provides enterprise-level computing power, storage and flexible customization options for users who need the power of a rackmount server or tower workstation, but in an all-in-one package that is small enough to be easily transported.

Figure 2
Radius EX Plus supports up to 14 hard drives that require no tools to remove. That's in addition to up to 18 fixed hard drives or 20 solid-state drives.

Unlike prior NextComputing portables that also offer similar benefits in terms of performance and configuration flexibility, the Radius EX Plus is the first of its kind to offer key features previously unavailable in any portable computer. These include AC 110/220V and 48V DC input options up to 650W 1+1 redundant or 1300W 2+1 redundant. Also included is support for mixed AC 110/220V and 48V DC in the same system. The units accommodate up to 14 hard drives that require no tools to remove. That's in addition to up to 18 fixed hard drives or 20 solid state drives.

Redundant power options protect important data and processes on the system in the event of either an external power source outage or internal power supply failure. Users who require this level of reliability, such as deployed emergency response teams, homeland security forces, or television broadcasters, are now assured a level of hardware availability otherwise found only in larger rackmount systems.

**Laptops as Control Systems**

Rugged laptops serve an increasingly important role in military systems as a user interface or control system. Getac has upgraded its B300 rugged notebook computer with faster processors, improved graphics and increased storage (Figure 3). Getac offers a third generation 2.6 GHz Intel Core i5-3320M (MAX 3.3) or 2.9 GHz Core i7-3520M (MAX 3.6) processor to improve CPU performance by up to 67% and nearly double the graphic performance with a 91% gain over the previous generation. In addition, the B300 now comes standard with a 500 Gbyte hard drive and offers solid-state drive storage up to 256 Gbytes.


Figure 3
The B300 incorporates Getac's QuadraClear display technology. It can also be configured with a filter-free night vision mode ensuring easy viewing without giving away your location.

The Getac B300 incorporates Getac's industry-leading QuadraClear display technology. For military soldiers working in hostile areas, the B300 can also be configured with a filter-free night vision mode ensuring easy viewing without giving away your location. The B300 features the ultra-fast USB 3.0 and USB 3.0/eSata combo ports, both HDMI and VGA ports, a IEEE 1394a port, an Ethernet port and two legacy RS-232 serial ports. Additionally, the B300 offers built-in GPS, 4G LTE wireless Internet and a host of security features including a built-in fingerprint reader, Intel vPro Technology and TPM 1.2.

Sometimes the priority in portable military workstations is to have supercomputing levels of performance in a small space. Eurocom takes that approach with its Panther form factor. It features enough computing horsepower to easily run the most demanding and sophisticated military grade graphical user interfaces, allowing the warfighter and commander to get the most up-to-date situational awareness data on the battlefield. The Eurocom Panther form factor is a fully upgradeable solution that can be configured as a Mobile Server (Panther 5SE), Mobile Workstation (Panther 4.0) or 3D Super Computer (Panther 5D) (Figure 4). Eurocom uses a high-performance desktop replacement chassis with the highest quality mobile components such as Intel Xeon E5 processors, NVIDIA Quadro K5000M graphics and Intel S3700 Solid State Drives that are able to support mission-critical products, server class operation as well as professional workstation operation.

Figure 4
The Panther serves as a high-performance desktop replacement chassis with processors such as Intel Xeon E5 processors, NVIDIA Quadro K5000M graphics and Intel S3700 Solid State Drives that are able to support mission-critical products, server class operation as well as professional workstation operation.

The Panther provides fast deployment right out of the box, combined with easy relocation. The ability to hand carry the system makes the Eurocom Panther an extremely easy system to travel with while providing super computer capabilities. The system uses quad channel memory supporting up to 32 Gbytes of DDR3 1600 MHz RAM via four 8 Gbyte SODIMM 204 pin modules.

**Purpose-Specific Portable Systems**

A recent trend is to integrate a complete purpose-specific set of functionalities into a mobile workstation-type of form factor. Pentek takes this approach with a RF/IF signal recording and playback system that features recording and playback of IF signals up to 700 MHz with signal bandwidths to 200 MHz. The Model RTR 2727 rugged portable recorder from Pentek can be configured with 500 MHz 12-bit A/Ds or 400 MHz 14-bit A/Ds and an 800 MHz 16-bit D/A. Pentek's SystemFlow software allows turnkey operation through a graphical user interface (GUI), while the SystemFlow application programming interface (API) allows easy integration of the recording software into custom applications.

At the heart of the recorder are the Pentek Cobalt Series Virtex-6 software radio boards featuring A/D and D/A converters, DDCs (digital downconverters), DUCs (digital upconverters) and FPGA IP. This architecture allows the system engineer to take full advantage of the latest technology in a turnkey solution. Optional GPS time and position stamping captures this critical signal information within the recording.

The RTR 2727 has a portable, lightweight chassis with up to eight hot-swap solid-state drives (SSDs), front panel USB ports and I/O connections on the side panel. Its extremely rugged, 100 percent aluminum alloy case is reinforced with shock absorbing rubber corners and an impact-resistant protective screen. Shock- and vibration-resistant solid-state drives (SSD) with combined capacity to 3.8 Terabytes make the RTR 2727 a reliable, portable field instrument. Available I/O includes audio and VGA video, RS-232/422/485 serial, multiple USB 2.0 and USB 3.0, eSATA and dual GbE connections. The built-in Windows 7 Professional workstation with an Intel Core i7 processor gives the user total flexibility in routing data to various drives, networks and I/O channels. Also, the user can install post-processing and analysis tools on the system itself to operate on the recorded data. The RTS 2727 starts at $39,995.

**Expansion for Custom I/O**

There's a wide variety of custom I/O required in many mobile military applications. With that in mind, One Stop Systems has introduced the nanoCUBE expansion enclosure with Thunderbolt or PCIe expansion. The nanoCUBE supports a single PCIe x8 Gen3 short card, allowing you to add greater functionality to your laptop or workstation. This lightweight appliance is the ideal companion to a PC or workstation when you want to add a special I/O card today that you don't have room for in a system and that military users can easily disconnect later. For example, adding a video editing card to the nanoCUBE creates a portable video editing appliance. Lightweight and whisper quiet, it's ideal to accompany a laptop to field locations that may be noise-sensitive environments.

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