

Soldier borne sensors and electronics arm the future army

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Defense leaders around the globe are exhibiting a new sense of urgency for designing upgraded technology devices beyond their aging electronic systems of the past. Rapid development of more modern military technologies are changing much of today's mission format and style. Defense strategies have become dependent upon continuous surveillance-analysis-and-response tactics. Upgraded instruments are being developed for more portable and interconnected military defense systems. Many of the most advanced electronic devices are interconnected with extended networks that control and coordinate multiple battlefield systems. In response, Soldier Borne Sensors, (SBS), and other portable devices are being used in the battlefield to monitor, and communicate directly with, ground troops. Advances in networking offer higher speed information monitoring of onsite mission activities from a distance, as well as extended data flow to and from military surveillance, and control from satellite systems above. To further protect the soldiers, simultaneous health and safety monitoring is planned for each combat warrior in the field using biometric sensors installed in the body armor and on body parts of the individuals. Individual warriors will also be equipped with options for control and monitoring of remote electronic devices while remaining active in the battlefield.

Ground troops are increasingly more vulnerable to enemy electronics. Highly portable wiring connections are integrated within the soldier's clothing and body armor to route signals from detection instruments to control modules on board. Micro and Nano-sized connector and cable are used in systems for Future Soldiers and Special Forces around the globe. Maintaining high signal integrity during operations is a critical for continuous performance when exposed to wide temperatures and environments situations as advanced body armor systems can offer constant position and communications with control centers.

The new electronic army of today is ever-present in our military technologies. Much of a nation's defense begins with



Underwater Scope for Seal Team

knowing what is happening and, more importantly, what is about to happen before it does. Constant surveillance and mapping has been improved by use of multispectral and LIDAR, (light detection and ranging), imaging techniques. Previous generation laser and optical surveillance devices are limited in what they can see. Lidar systems penetrate masking and camouflage devices as well as forest and jungle shielding. New phased array radar and photon emission



Black Hornet UAV

surveillance methods use the principle of launching multiple light beam signals, in a phased method, that focuses the surveillance beam into one focused point. It then moves the focus from position to position to develop and analyze the reflected images coming back to the receiving antenna. Triggering and collecting data this way is very accurate but utilizes massive amounts of data at relatively high speeds. Advanced chip technology has evolved rapidly to the use of CCD and enhanced mode Gallium Nitride, circuits. Modern chip techniques also offer high speed digital switching and data storage systems in micro-sized computer chips on-board portable circuit cards. Programs like the newer soldier, sensor and laser (SSL) program equips warriors of today with a new options. For example, a Nano-sized drone that soldiers can carry in their backpack for advanced image gathering. Flir's Black Hornet Nano-drone contains video cameras and thermal imagers to assist the soldier before engagement. Larger UAV surveillance systems offer endurance hovering and long range destination surveillance options that can be controlled directly from individuals on the battlefield.

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The newer miniaturized cable and contact systems utilize a military quality Nano-sized circular connector for numerous reasons. Beyond rugged and lightweight, the military quality Nano-circular connectors include a keyed contact and alignment system for blind mating with gloves on and breakaway instantly when needed. Fit and function are perfect for gun scopes, on-board sensors and inside UAVs and remotely controlled ballistics. Nano-circular connectors are also designed for water-proof applications within the weapon as well as the warrior's equipment needed for duty in Seal type functions. Nano-sized interconnects of various designs are used in soldier-borne systems to control field based mid-sized portable UAVs. The larger UAVs carry heavier weapon loads and receive the benefit with extended flight time and higher resolution



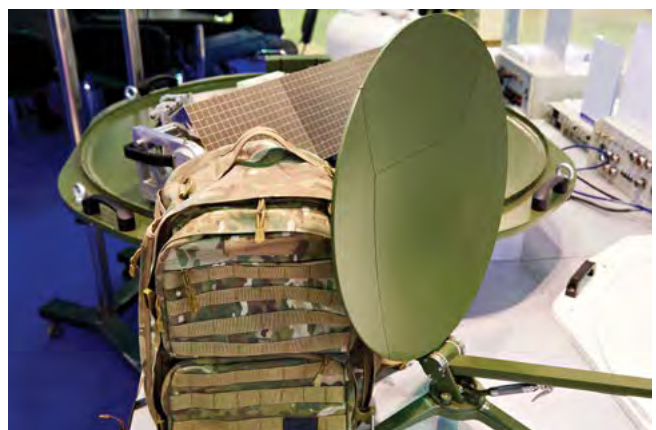
Quick Disconnect Nano Circular



Soldier Borne Communication System

digital images collected for transmitted surveillance information.

Newly designed portable antenna systems like U.K.'s "MSTAR", (Man-portable Surveillance and Target Acquisition Radar), provides a ground assault and surveillance system that can move within minutes for the combat unit in the field. Night vision and target recognition and tracking assists with control and communication of UAVs and helicopters working the operation above. The ground team has combined map imaging with GPS tracking and electro-imaging all on one screen. Transmit and receive units are most often dependent on portable power as well. Micro and Nano-sized interconnects and being designed for light weight to offer both high-speed signal and power to units with only one cable. This reduces the system to only one interconnect saving weight and bulk within the body armor system. These hybrid connectors basically squeeze high reliability elements of proven power and smaller signal connectors into one design. Power sections are isolated from the signal portion and cables have separately shielded power wires within the harness design.



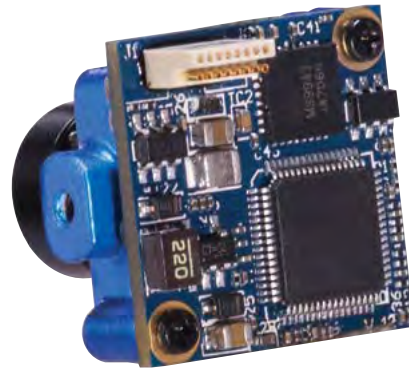
Ground Troop Portable Antenna

Rapid design: The defence industry of today has access to many advanced sensor, biometric detection devices, and high speed data acquisition technologies. As these devices are being adapted into highly portable defense electronics for soldier borne applications, new interconnect systems are needed. Application specific connector and cables are



Miniature Power Plus Signal Connector

- ▶ rapidly designed by connector designers using solid model imaging software. Those first-look designs are then shared remotely with the defense system group to insure fit within the planned device. When approved, new connectors are assembled using a combination of newly machine or molded insulators to match the circuit requirements. Often, pieces of existing connectors are matched into new insulator housings. Additive manufacturing such as 3-D printing are available to offer nearly instant physical models for final assurance of fit within main modules. Specialty 1st article units are shipped to the system design center for approval while additional materials are being accumulated for first prototype production.



PZN Connector on Micro Camera

Defense electronic systems are rapidly being adapted to the soldier-borne needs of today. Connector and cable systems are set up and ready to offer modern systems that fit the needs of higher speed rugged portability needed in the battlefield. Micro and Nano-sized connector and cable have been used in systems for Future Soldiers and Special Forces around the globe. Advanced body armor systems can offer constant position and communications with control centers. Ground troops can see in advance of engagement, and control remote devices to assist in their mission. Highly portable electronic interconnections and new designs are rapidly available for testing and adaptation to new applications being employed in the defense industry. ■

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