Battlefield Communications Go Wideband

The new Falcon III® AN/PRC-117G delivers revolutionary capabilities for mission success.

One of the key elements in transforming the U.S. military into a more agile fighting force is a 21st century communications system that delivers the power of wideband networking down to the individual warfighter.

It’s a vision for tactical communications that’s been discussed for more than a decade. And now Harris Corporation has delivered with the new Falcon III 117G(V)1(C), the first multi-mission, multimode wideband networking radio available in full-rate production today.

The most advanced tactical radio ever created.

The AN/PRC-117G manpack will help the military advance its vision of a networked battlefield by providing access to a range of mobile, high-data rate applications.

The Falcon III manpack follows years of discussion about the military’s need to develop wideband communications systems that allow for better battlefield coordination. In a 2003 study, the Defense Science Board indicated that the military’s transformation hinged on the arrival of tactical communications that are “agile, adaptable, high-capacity, network-centric, efficient, and robust.”

“The challenge before the Department of Defense (DoD),” the Defense Science Board wrote, “is the integration of multiple radio technologies and the network protocols, routing, and information dissemination technologies into an adaptive, mission-oriented communications system serving the warfighter. This is a significant challenge that must be addressed in the near future.”

The Harris Falcon III AN/PRC-117G, which went on the market in January 2008 following its Type-1 certification from the National Security Agency, is the answer to that challenge.

The radio is designed specifically to fit into the tactical networks of the future, which will have to support a wide variety of data-intensive applications, such as biometrics, situational awareness, and reconnaissance feeds, while offering a high degree of mobility, security, and survivability. These Internet Protocol (IP)-based networks must have the ability to perform and heal as necessary to adapt to their tactical environments. Furthermore, the radios must be able to
communicate with a broad range of legacy ground-based, airborne, and satellite battlefield assets.

The Falcon III manpack transmits IP data to the tactical Internet at on-air rates of up to 5 Mbps, a 100-fold increase for tactical links. It also offers an extended frequency range of 30 MHz to 2 GHz.

“We’ve designed this radio with the capability to pass Type-1 secure voice, video, and situational awareness traffic simultaneously, providing a common operational picture of the battlefield to every node on the network,” said George Helm, vice president and general manager, U.S. government products, Harris RF Communications. “We are certain that this technology will reliably deliver the critical information our warfighters need.”

The Falcon III manpack is ideal for demanding tactical applications such as on-the-move vehicular and man-portable communications as well as tactical operations centers, command posts, and air operations centers.

The manpack is shipped with Harris’ own networking waveform, Advanced Networking Wideband Waveform (ANW2). ANW2 is an ad-hoc, selfforming, self-healing networking waveform. When nodes move in and out of range, they are automatically added or removed from the network. Other waveforms include SINCGARS, HAVEQUICK, and VULOS—with DAMA to be added in the very near future.

**Expanded capabilities**

The vast majority of currently fielded tactical equipment is limited to narrowband voice and data. These radios lack the ability to support the increased data capacity required to develop a clear picture of the quick-changing operational tempo.

By contrast, the wideband AN/PRC-117G offers an expanded set of capabilities that will enhance the amount of information available to warfighters and increase operational effectiveness.

MEDEVAC, for example, is emerging as a particularly important emerging application for the AN/PRC-117G in demonstrations for the U.S. Department of Defense. MEDEVAC events are highly emotional. In the rush to get aid to wounded soldiers, information passed by voice can get easily confused, said Brook Reinhold, applications engineer, Harris RF Communications. Reinhold served as a Brigade Communication Chief in
Iraq during the initial U.S. invasion, and retired as a First Sergeant with the 82nd Airborne Division based at Fort Bragg, N.C.

“Using the data function of the radio, with chat software, allows the information to pass correctly and immediately from a front-line soldier directly to all levels of command and the medical evacuation teams,” Reinhold said.

One significant feature is the ability to send streaming video with simultaneous voice communications, a feature that could even be extended to unmanned surveillance or reconnaissance aircraft.

In addition, with wideband networking, “the AN/PRC-117G has the powerful capability to allow commanders—literally—to see what’s around the next mountain or hill, or behind the next building,” Reinhold said.

For example, consider an attack on a convoy in the mountains. Such an event requires an immediate reaction from many different units. Previously, this response was pieced together through fragmented systems.

By leveraging a network of AN/PRC-117G radios, commanders would be able to launch and coordinate an immediate response using some or all of the following applications:

- Streaming video: Commanders would be able to analyze reconnaissance feeds from cameras, both on the ground and in their air, to plan their response.
- Legacy interoperability: Quick Reaction Force teams would be able to call for close-air support for a counter attack.
- Text messaging: Convoy personnel would be able to send details via text messaging, limiting confusion and removing traffic from voice networks.
- Satellite communications: The radio will support reach-back capability through satellite communications to connect warfighters to brigade headquarters.

**Architecture-compliant software communications**

The AN/PRC-117G shares a common operating environment with the Falcon III AN/PRC-152(C), the most widely fielded JTRS radio with more than 40,000 radios deployed worldwide. The AN/
PRC-152(C) is the first and only radio to be certified as fully compliant with Version 2.2 of the JTRS Software Communications Architecture (SCA), the basic building block of a software-defined radio.

Since it is designed to comply with the SCA, the Falcon III manpack is software upgradeable and has the capability to host the JTRS Soldier Radio Waveform (SRW) as soon as it is available. “While ANW2 is very capable and provides great performance today, Harris is committed to supporting the U.S. Government Soldier Radio Waveform,” said Bill Beamish, product line director, Falcon III manpack radios, Harris RF Communications. “The ANW2 waveform is Type-1 certified with HAIPE IP Security,” Beamish continued. “It allows U.S. Top Secret and Below traffic to be securely communicated over ‘black’ IP networks.”

The ANW2 waveform allows the AN/PRC-117G to fulfill the military’s growing need for robust on-the-move communications capability. With the transformation to a smaller, more flexible force, military units often cover large distances in short periods of time. In an after-action report following the start of the Iraq war in 2003, the Third Infantry division noted the critical need: “Systems and equipment that could not execute on the move quickly became ineffective,” the report reads. “Twice during OIF, the division moved over 350 kilometers in less than 80 hours. These types of offensive operations required all units to plan, command, and control while moving towards the objective.”

Harris is positioned to help the DoD maximize its use of the manpack through other advanced tactical communications products.

“The Falcon III manpack, in conjunction with other Harris tactical communications, now gives the military the ability to use several high-speed applications, simultaneously and on-the-move, while maintaining legacy interoperability,” Helm said. “We believe this radio, backed by our systems expertise, is poised to help the military broadly transform its battlefield communications system.”

About the AN/PRC-117G

- Newest member of Falcon III radio family
- Wideband and narrowband secure voice and data traffic
- High-speed, mobile ad-hoc networking
- Features Harris ANW2 waveform, upgradeable to SRW
- 30 MHz to 2 GHz frequency coverage
- SCA v2.2 operating environment
- Sierra II Programmable Crypto
- Embedded SAASM GPS
- Simultaneous video, text messages, and situational awareness
- Legacy interoperability with SINCgars, HAVEQUICK I/II, and DAMA-TACsat
- Substantially smaller and lighter
- Lightweight and portable, less than 150 cubic inches
- HAIPE compliant