



Photo courtesy Claire Heinenger US Army

Developments in Blue Force Tracking ●●

Situational awareness is of vital importance in the battlefield since it provides the military commander with an operational picture. Blue Force Tracking (BFT) plays a key role in situational awareness, providing information on friendly and hostile forces, an overview of the surrounding environment, and enabling a messaging platform between different units and the command centre. BFT has come a long way since its first iteration, enabling increasingly advanced capabilities to the benefit of the warfighter.

Blue Force Tracking (BFT) describes a GPS-enabled system that provides military commanders and forces with location information of both friendly (blue) and hostile (red) forces. Such systems typically include a computer, satellite terminal, satellite antenna, GPS receiver, command and control software, and mapping software. The system displays the location of the host vehicle on a map, along with the locations of blue and red forces. Additional capabilities include reporting battlefield locations and conditions such as mine fields or other obstacles, and route planning tools with proximity warnings, while newer BFT systems also enable sending and receiving text and imagery.

Blue Force Tracker-1 (BFT-1) and Blue Force Tracker-2 (BFT-2) are used by almost every ground and aviation vehicle in the US Army today. Although they fulfil the same function, each operates over its own dedicated satellite channel. The original BFT-1 was built by Northrop Grumman in the 1990s, and was hailed as a massive benefit to situational awareness in the Iraq War. However, limitations included communications delays of up to five minutes, and the inability of GPS to penetrate into buildings.

The BFT-2 satellite network was launched by ViaSat several years ago, to provide faster position, location, information (PLI) refresh rates and greater data throughput capabilities. Some 10 times faster than BFT-1, BFT-2 delivers almost real-time accuracy with 99.95 percent network availability. Both ground vehicular and aviation transceivers operate over ground station equipment installed at L-band satellite provider sites, which are controlled by satellite NOCs. The ground vehicular transceiver is a single Line Replaceable Unit (LRU), while the aviation transceiver is a two-LRU design that separates the antenna and RF assembly from the modem assembly to offer better aerodynamic performance. Both transceivers have successfully

completed MIL-STD-461, 464, and 810 testing.

While today BFT uses commercial satellite connectivity, the ultimate intention is to bring it into the Warfighter Information Network-Tactical (WIN-T).

Leveraging existing assets

In June 2016, it was announced that the US Army was testing a new channel-sharing capability for Blue Force Tracker-1 and Blue Force Tracker-2 to reduce costs. Currently, both BFT systems combine command and control software, satellite transmissions, GPS capabilities and other elements, but operate over different satellite channels. Sharing a single channel is expected to reduce satellite costs by as much as 60 percent, keep infrastructure replenishment expenses in check, and make the BFT system easier to use by eliminating the need to shift between different hardware and software set-ups when working between the two BFT systems.

"They are looking for ways to leverage existing investments, rather than pay to wholesale replace them," said Stan Sloane, President and CEO of Comtech Telecommunications Corporation. "Doing this is a good demonstration of that logic. It protects the investments in existing systems by making them more interoperable."

Comtech Telecommunications Corp announced in April 2016 that the US Army had exercised Option Year 2 of its three-year Blue Force Tracker-1 sustainment contract and related BFT-1 Intellectual Property licence agreement and was awarded an initial funding of US\$20 million to continue to provide sustainment support for the US Army, Program Executive Office Command, Control, Communications-Tactical (PEO-C3T), Joint Battle Command-Platform (JBC-P) BFT-1 Mission, a battle command real-time situational awareness and control system.

The US Army's channel-sharing tests, which culminated in an operational test on both ground and aerial vehicles at the Communications-Electronics Research, Development and Engineering Center (CERDEC) Intelligence and Information Warfare Directorate (I2WD) Flight Activity in January 2016, evidenced channel-sharing as a practical alternative to the current approach. The single-channel plan will duly be built into the next generation of Blue Force Tracker, currently known as BFT-2.5. Market research for more advanced antennas, processors, modems and transceivers is currently ongoing prior to the system launch.

Looking to the next iteration

With the programme to incorporate BFT-1 and BFT-2 ongoing, US defence forces are already looking to the next big thing in BFT capabilities. The US Army and US Marine Corps is currently partaking in the Joint Battle Command Platform (JBC-P) programme, which was designed to provide military leaders greater command, control and situational awareness than ever before.

The Marine Corps Systems Command (MCSC) has installed almost 1,100 of the systems into the Assault Breacher Vehicle, M88 Tank Retriever and HMMWV vehicles since July 2016, while the US Army has tested JBC-P within the Army's 3rd Infantry Division and 10th Mountain Division.

"JBC-P is the Marine Corps primary command, control and situational awareness tool for the battalion and below," said Capt. Jamie Claflin, JBC-P Project Officer at MCSC. "It allows the commander to see friendly forces in his area of responsibility in real time including other services, and also provides situational awareness data that is reported into the common operating picture."

JBC-P delivers faster satellite communications using BFT-2, a high-speed GPS satellite network 10 times faster than the previous system that delivers secure encrypted transmissions and vastly reduces reaction times thanks to the lower latency. BFT-2 uses Inmarsat's I-4 satellite constellation to gain much more bandwidth with higher data rates (up to 120kb on the forward link and up to 3kb on the return link), drawn from new transceivers. JBC-P is also integrated with the Tactical

Intelligence Ground Reporting (TIGR) system, which provides historical intelligence data, including area structures, obstacles and previous incidents for a given site.

"JBC-P also features a multi-function screen with mapping and message management environments," said Ignacio Filgueira, Lead Engineer for JBC-P at MCSC. "Operators can select different functions including a real-time chat room capability where they can send and receive messages, use icons on a map that show other JBC-P-equipped vehicles, position information, adversaries, threats and shared SA and C2 capability with JTCW."

The joint nature of the JBC-P enables greater cooperation between the US Army and US Marine Corps. With both forces using the same software, the Army's Network Operation Centre (NOC) can oversee all BFT operations and enable greater cooperation between the two forces, enhancing both operational and cost efficiencies.

"Today, through JBC-P, Soldiers and Marines are no longer burdened by operating with two separate command and control/mission command systems," said Lt. Col. Shane Sims, the Army's Product Manager for JBC-P. "By using the same system, the Marine Corps and Army know where each other are in relation to the enemy. JBC-P enables them to communicate on missions together, which is a huge tactical and operational advantage over our adversaries."

With JCB-P Increment 1 already undergoing trials in line with the programme, an upgrade to JCB-P Increment 2 is scheduled to start in the 2018 fiscal year. Android technology is set to be a big enabler to incorporate emerging technologies into the JCB-P system.

The upgrade will give the warfighter a modernised user interface with preformatted messages, and a new terrestrial communication capability to enable data-capable radios when satellite communications are degraded or denied. JCB-P Increment 2 will be installed on additional Marine Corps platforms like the Medium Tactical Vehicle Replacement, Logistics Vehicle System Replacement, Assault Amphibious Vehicle, Light Armoured Vehicle and the High Mobility Artillery Rocket System, as well as being rolled out to the vehicles currently equipped with JCB-P Increment 1. **GMC**

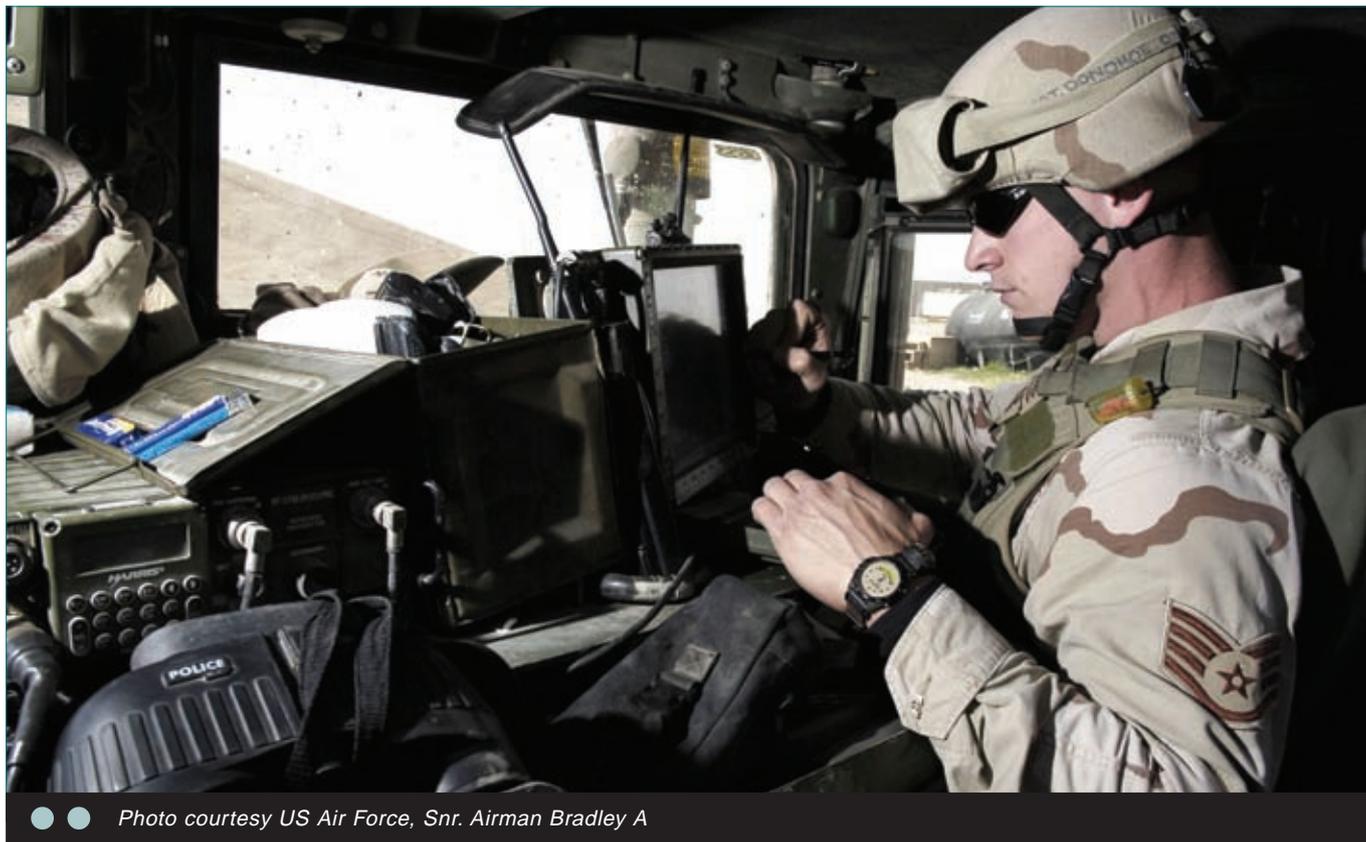


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